A Dozen Reflections on Life and Markets

Brett N. Steenbarger, Ph.D.

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I've never seen a trader succeed whose explicit or implicit goal was to not lose. The trader who trades to not lose is like the person who lives to avoid death: both become spiritual hypochondriacs.

No union was ever destroyed by a failure of romance. It is the loss of respect, not love, which ends a relationship.

Love, once present, never dies. It must be killed.

Sometimes we select markets--and trading styles--much as we choose romantic partners: by their ability to validate our deepest-held images of ourselves. Our choices generally succeed, for better or for worse.

Many a trader fears boredom more than loss, thereby experiencing the two in sequence.

Goodness of character is measured in loyalty to others; greatness of character is measured in loyalty to principle.

A measure of the soul: the degree to which the surpassing achievements of others evoke inspiration rather than envy.

If you listen to the words, you'll understand the brains of the speaker. If you listen to the tone, you'll understand his heart.

Show me what a man loathes, and I will show you what he cannot accept in himself.

Two traders: one increases size after a loss; the other gets smaller. Both continue to lose.

One encounters losing traders as often as one encounters losing golfers--and for much the same reason.

The absence of self-acceptance too often masquerades as the desire for self-improvement.

Brett N. Steenbarger, Ph.D. is Director of Trader Development for Kingstree Trading, LLC in Chicago and Clinical Associate Professor of Psychiatry and Behavioral Sciences at SUNY Upstate Medical University in Syracuse, NY. He is also an active trader and writes occasional feature articles on market psychology for a variety of publications. The author of The Psychology of Trading (Wiley; January, 2003), Dr. Steenbarger has published over 50 peer-reviewed articles and book chapters on short-term approaches to behavioral change. His new, co-edited book The Art and Science of Brief Therapy is a core curricular text in psychiatry training programs. Many of Dr. Steenbarger's articles and trading strategies are archived on his website, www.brettsteenbarger.com

A Trader's Self-Evaluation Checklist

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1) What is the quality of your self-talk while trading? Is it angry and frustrated; negative and defeated? How much of your self-talk is market strategy focused, and how much is self-focused? Is your self-talk constructive, and would you want others to be talking with you that way while you're trading?

2) What work do you do on yourself and your trading while the market is closed? Do you actively identify what you're doing right and wrong in your trading each day—with specific steps to address both—or does your trading business lack quality control? Markets are ever changing; how are you changing with them?

3) How would your trading profit/loss profile change if you eliminated a few days where you lacked proper risk control? Do you have and strictly follow risk management parameters?

4) Does the size of your positions reflect the opportunity you see in the market, or do you fail to capitalize on opportunity or try to create opportunities when they're not there?

5) Are trading losses often followed by further trading losses? Do you end up losing money in "revenge trading" just to regain money lost? Do you finish trading prematurely when you're up money, failing to exploit a good day?

6) Do you cut winning trades short because, deep inside, you don't think you'll be able to make large profits? Do you become stubborn in positions, turning small losers into large ones?

7) Is trading making you happy, proud, fulfilled, and content, or does it more often leave you feeling unhappy, guilty, frustrated, and dissatisfied? Are you having fun trading even when it's hard work?

8) Are you making trades because the market is giving you opportunity, or are you placing trades to fulfill needs—for excitement, self-esteem, recognition, etc.—that are not being met in the rest of your life?

9) Are you seeking trading success as a part-time trader? Would you be seeking success as a surgeon, professional basketball player, or musician by pursuing your work part-time?

10) Can you identify the specific edges you possess over the many other motivated, interested traders that fail to achieve success in the markets? Do you really have an edge, and—if so—what are you doing to maintain it?

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Accepting the Obvious

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This past week, I received an email with an excellent question that has bedeviled me in my own work with traders: Why do traders fight breakout, trending moves when they are so obvious? Time and again, I will see traders refuse to enter a market that is breaking lower because "I don't want to sell the lows". Worse still, traders will hold onto positions against the trend because "It's going to come back" or "The market is being manipulated."

Let's get down to basics:

Volume tells you where traders and investors are accepting value at a given point in time. If the market has been trading within a narrow range and then breaks above that range on high volume, it means that the market is accepting value at higher levels. If you were attending an auction for an artwork that you own and large numbers of bidders kept offering higher prices for the painting, you would conclude that the painting has not yet found its ultimate selling value. You surely wouldn't sell your art piece as soon as the first group of bidders starts to aggressively bid!

The market works on similar auction-based principles (see Mind Over Markets, the excellent book by Jim Dalton and coauthors for a discussion of auction theory in trading and the use of the Market Profile). Each day, we see an auction for such artworks as the S&P, NASDAQ, bonds, etc. The dynamic interplay between buyers and sellers determines value for those markets. It is when we see volume expanding on a directional price move that we realize that the market is out of balance. It will continue to move in its direction until it can attract sufficient buying or selling interest to create a new balance.

Not infrequently, I will ask a trader who missed a breakout move what happened to volume during that period? Very often the response will be "I don't know". The trader was so busy focusing on price—and so busy focusing on their own reactions to the movement—that the auction-based meaning of the breakout was lost.

I would argue that this is one incontrovertible law of trading: When something important happens in the market, good traders focus on the market and the meaning of the events. Bad traders focus on themselves and their frustration over missing the events, how they can make up the money they lost, etc. Incredibly, I have seen traders miss entire trending days because they were busy convincing themselves that they had "missed the move" on the initial breakout.

Still, there can be another reason for missing those obvious moves. Let me give three different, but related, examples of "refusing to accept the obvious":

1) A woman comes to counseling complaining of marital problems. Her husband has been staying out at night, not spending time with her. He told her he was working late, but she could not reach him at the office. One time she found someone's belongings in his car--a woman's--and questioned him. He explained that she had forgotten to take them from the car after he dropped her off at home following a late day at the office. When the counselor suggested that perhaps he was having an affair, she expressed anger toward the counselor and insisted that she just needed to "work on the marriage". Several weeks later, the husband moved out and moved in with the new woman.

2) A cancer patient has taken a dramatic turn for the worse, and tests confirm massive spread of the cancer. When the physician raises the issue of hospice care and ways of relieving pain in the final weeks of life, the family members angrily confront him and insist that he pursue "more

aggressive treatment" so that he could return home and, eventually, get back to work. Meanwhile, the patient is a virtual skeleton due to weight loss, cannot hold down food, and is visibly suffering.

3) A victim of abuse in childhood insists that her father was caring and minimizes the pain of her childhood, despite clear evidence that she was sexually molested, physically beaten, and frequently humiliated. She insists that she must have done something wrong to upset him, and will not use the term "abuse" to describe what she went through. She undergoes periods of depression when, even now, she reaches out to him, only to be rejected.

In all three cases, the difficulty accepting the obvious is the result of a ***need*** to believe something different. It isn't just that the individual is blinded to reality: it's a desire to perceive a different reality. In most cases where traders fail to act on breakout moves--or worse, get run over by them--there is a situation where the trader was actively anticipating a different kind of market. Once this becomes part of their analysis, it becomes *their* opinion, and their ego gets caught up in it. The term traders use is that they become "married to their opinion".

What I've found is helpful is the active creation of "what-if" scenarios in the market that can be mentally rehearsed in a vivid way. If we are range bound, what if we break above the range with expanded volume? What if the small and midcap sectors break above their range, even as my market stays range bound? What if we probe the top of the range and volume dries up? Such what-if scenarios actively prevent the trader from getting caught up in assumptions that become opinions that become marriage partners. "Plan the trade and trade the plan" is common advice, but good traders always have a Plan B.

Finally, let's consider the reverse scenario: Traders in a range bound market who convince themselves at every move that a breakout is at hand. Once again there is a **need** to believe, but for a different reason. Too eager for action, bored by the bracketed trade, needing of some P/L juice, they cannot accept that the market has found value and is staying there. Low volumes speak as loudly as high ones to those willing to listen. An ES market that trades only a few hundred contracts per minute is not attracting "other timeframe" participants and will only be jostled back and forth by "locals". It is very easy to overtrade these markets by anticipating breakouts rather than waiting for evidence of their occurrence. The telltale sign of this problem is the frequent complaint of traders that "this market just won't trade". They are busy fighting what the market is doing rather than following the market's lead.

Ayn Rand was right: Many problems boil down to evasion once our needs and desires conflict with reality.

Thanks to Bob Kieffer (www.r7.com) and Bill Duryea (www.marketshaman.com) for inspiring this article with their excellent observations.

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Anticipating Market Turns

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Note: The following is an excerpt from Gail Osten's interview with Brett Steenbarger in the March, 2003 issue of Stock, Futures, and Options (SFO) magazine entitled "The Windmills of Your Mind and the Pathway to Your Trades". The entire interview can be accessed at www.sfomag.com.

Gail Osten: …Too often, people give generalities, but they really want to know how these strategies are put together. At this point, I think your daughter's fish story might be appropriate.

Brett Steenbarger: This came out in a posting that I did for Laurel Kenner and Victor Niederhoffer's Speculators column, which is on the MSN Money site. They requested ideas about trading and indicators for trading. My daughter Devon, who was about 10 years old at the time, came up with this idea with me. We were examining stocks in the basket of 40 issues that I [follow], and she had the idea that some of the stocks were strong, and some were weak. Some of the stocks were going in one direction, and the others weren't. It was her view that the stocks were like schools of fish and that ones that are strongest are the "lead fish". So if you want to know what direction the market is going in, you had to look at the lead fish—in other words, the stocks that were leading. Since then, it's turned out to be a helpful, qualitative insight. Sometimes the market will be going down and down and down, but you'll notice one or two or three stocks are refusing to continue to go down, and they're actually starting to bubble up. Those are the candidates as lead fish, and it makes sense to follow those stocks. It makes sense to think about a turn around in the broader market as more of the individual issues follow those lead fish.

Assessing Intraday Trendiness

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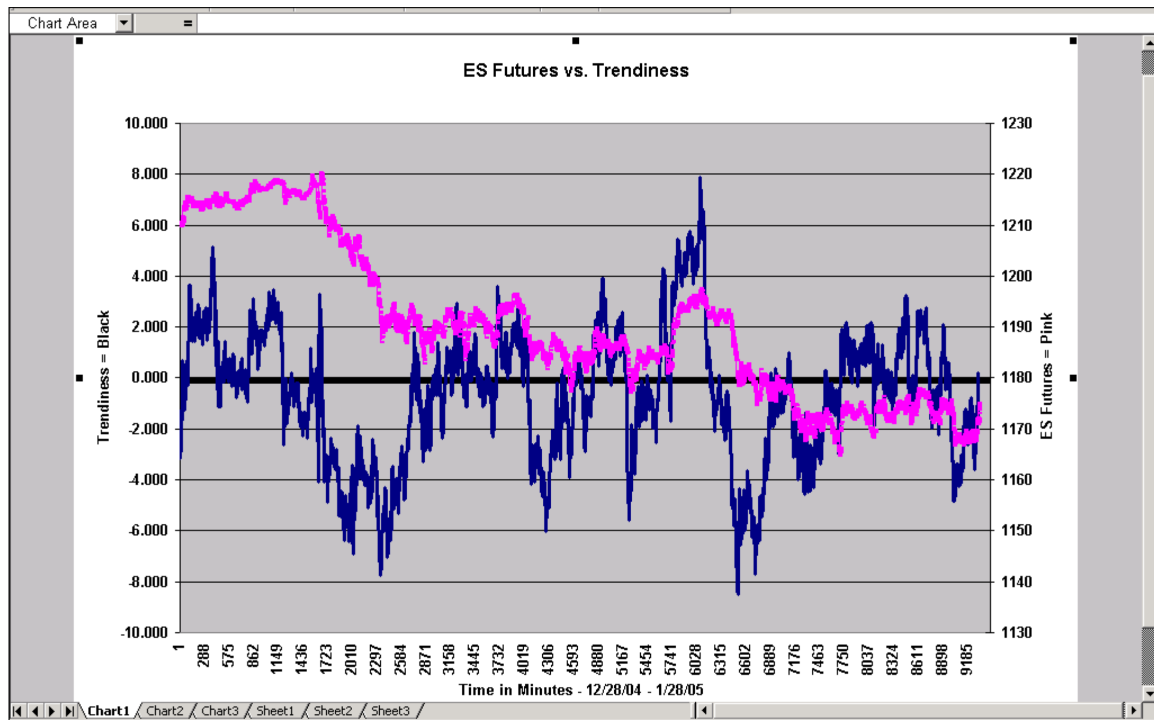
Each day the Weblog posts a trendiness measure that captures the trending qualities of the previous day's trading. The basic logic behind the trendiness measure is that shifts in a market's directional persistence precede actual price changes. Prior to outright declines, markets lose upside momentum and vice versa. The trendiness measure looks at directional movement over the past day and compares it to the day's total movement. The result helps alert us to shifts in the short-term trend. It is also particularly helpful in identifying non-trending markets.

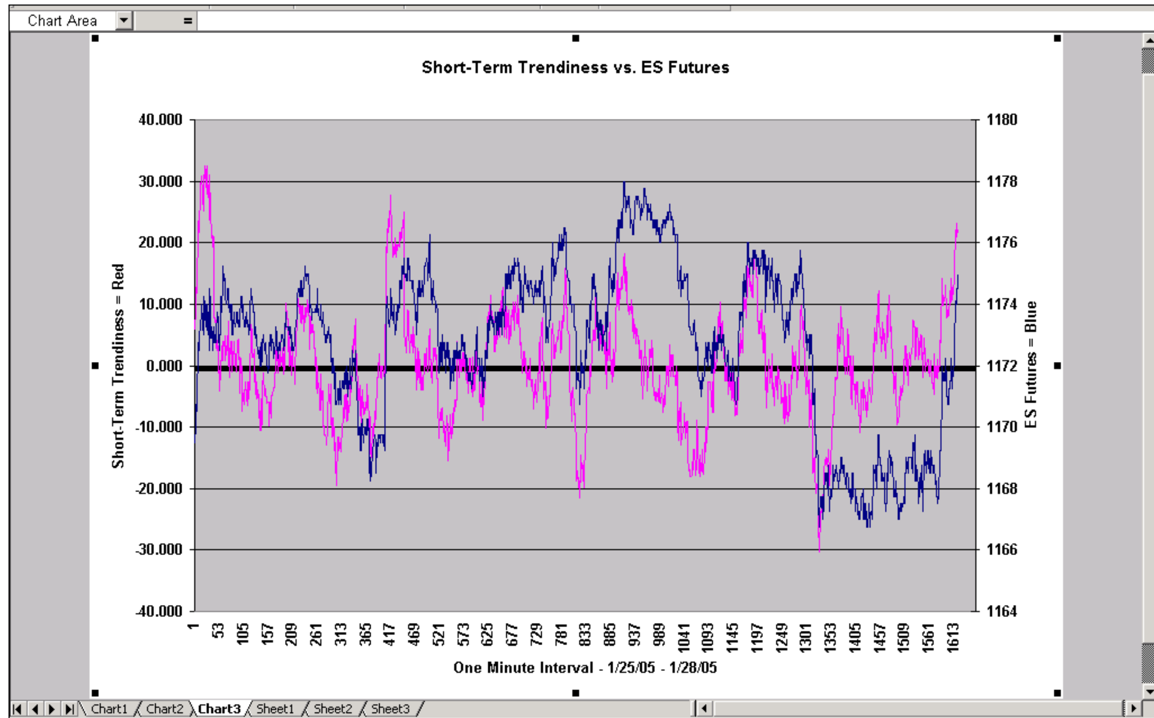
Below is the Trendiness measure, as posted to the site:



Note that downside trendiness has tended to precede price lows, and upside trendiness has tended to precede price peaks. Note also during the most recent price period, the trendiness reading stayed between –2.5 and +2.5 for most of the time, keeping us alerted to the non-volatile trading environment.

Having found some success with this measure, I decided to construct an intraday version that might assist with shorter-term trading. The logic behind the Short-Term Trendiness measure is the same; instead of looking over a past day for trending behavior, it evaluates a 45 minute lookback period.

Below is a chart of the Short-Term Trendiness measure.



Once again note that the trendiness reading tends to bottom prior to price lows and peak prior to price highs. In a non-trending environment, the amplitude of the peaks and valleys in the measure are quite similar; in a trend, we see the trend measure make distinct peaks (bullish trend) or valleys (bearish trend), with countermoves bringing the short-term trendiness toward the zero line prior to reversal.

Thus far I have found these trend measures to be more reliable in identifying relative price extremes than conventional indicators, such as RSI and Stochastics. I will be investigating applications of the measure to a variety of markets in coming weeks.

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Becoming the Person You Know You Can Be

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***Note: A version of this article appeared on the Trading Markets site the week of 10/3/05*.**

This is one of my shortest articles, and it may be one of my most important.

In bodybuilding, there is a principle known as "train-to-failure" (TTF). The idea is that you lift that amount of weight that permits you at least ten repetitions, but continue the lifting to the point of failure: the point at which you can no longer sustain the repetitions. Such a heavy-duty program, as outlined by the late Michael Mentzer, is low force (to minimize injuries) and high intensity (drawing upon the body's full reserves). This program also contradicts usual practice, which has athletes lifting every day. Mentzer, a world class bodybuilder, found that a limited number of repetitions to failure were sufficient to stimulate muscle growth, as long as there was an adequate period of recovery following the training stimulus. When first espoused, the idea of doing a limited number of intense repetitions and then staying out of the gym during the recovery phase was heretical. Now it is the backbone of many successful approaches to bodybuilding and strength training.

As Mentzer noted, the idea of TTF is itself a reflection of a principle in exercise physiology called SAID: Specific Adaptation to Imposed Demands. The body, according to SAID, will develop along the lines of the demands imposed upon it. If you impose intensive demands upon a muscle set, that set will develop more than others that have not been challenged. The opposite of SAID is deconditioning: the absence of demand upon the musculoskeletal system. Astronauts in space for a considerable period of weightlessness lose body mass due to deconditioning and, at times, have had to be carried from their spacecrafts due to a loss of strength. Their bodies adapted to the absence of demand.

The vast majority of people live their lives the way uninformed athletes train: they take on too many demands, none of which are sufficiently intense to take them to failure. Theirs is the equivalent of lifting a twenty-pound barbell for hours on end. They become tired, but not strong. By the time they get old, they are chronically tired, and then retire from all demands. For many, retirement is an exercise in mental, physical, and spiritual deconditioning.

Truly great people live their lives on a TTF basis. They challenge themselves until they fail, and that provides new challenges. They ultimately succeed, because the challenges that produce failure also build their adaptive capacity. Their minds and their personalities exhibit SAID: they adapt to imposed demands.

Now ask yourself: If you trained in the weight room as hard and as smart as you train for trading success, how strong would you be?

The reality is that few traders train at all, and those that do rarely impose demands on themselves that require growth and adaptation. The bodybuilder knows that effort is a friend, a stimulus to development. You push yourself to your limits, and then you adapt to those imposed demands. In simulated trading--and in the practice that comes from trading small size--it is not enough to concentrate and focus: you develop the capacity to operate in "the zone" by testing the limits of your mental stamina. Similarly, don't just follow your trading ideas; test them until they break. Then you'll be able to figure out where they are weak and how you can fix them. *We cannot know our limits unless we are willing to venture beyond them.*

Mentzer realized that, to become the person you know you can be, you have to do more than you think you can do. Paradoxically, you will find your greatest freedom, in the gym and in life, in the imposition of your most stringent demands.

Bio:

Brett Steenbarger, Ph.D. first corresponded with the late Mike Mentzer in April, 2000 (see the "Testimonials" section of Mike's site). Brett is Associate Clinical Professor of Psychiatry and Behavioral Sciences at SUNY Upstate Medical University in Syracuse, NY and author of *The Psychology of Trading* (Wiley, 2003). As Director of Trader Development for Kingstree Trading, LLC in Chicago, he has mentored numerous professional traders and coordinated a training program for traders. An active trader of the stock indexes, Brett utilizes statistically-based pattern recognition for intraday trading. Brett does not offer commercial services to traders, but maintains an archive of articles and a trading blog at www.brettsteenbarger.com.

Behavioral Patterns That Sabotage Traders – Part Two

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Consider the following psychological scenarios:

- A student needs to pass an anatomy course final exam in order to successfully complete his first year in medical school. Because his first several exams were on the borderline between passing and failing, the course grade entirely rides on the final. As the time approaches for the big test, the student finds himself increasingly worried about the test—particularly when he misses questions from his practice exams. The worry interferes with his sleep, which in turn makes him even more concerned that fatigue will prevent him from doing well. By the time he takes the exam, he is tired and nervous and misses many questions, often by second-guessing right answers.

- A young woman has never been particularly uncomfortable in public speaking situations, but now is asked to give the most important presentation of her career. The result of this presentation could spell the difference between landing a major client for her firm vs. losing the client to a competitor. During the talk, she notices that the audience members from the firm she is wooing don't seem especially attentive. This suddenly raises her anxiety, and she desperately tries to spice up the presentation. When she loses her place in the talk, she becomes flustered, and finishes the presentation on a hesitant note.

- A basketball player has been the team's leading scorer, but starts out a game missing his first five shots. The opposing team is double-teaming him, and he is having difficulty breaking free for open looks at the basket. Determined to take matters into his own hands, he decides to penetrate the opposing defense and draw fouls. Instead, he picks up two quick charging calls. Now fearful of being taken out of the game for his fouls, he searches for his shot by moving a little further out on the perimeter. When these shots don't fall, he stops looking for his shot and throws two errant passes.

- A trader has several winning trades in a row and, feeling confident, increases his size to take advantage of his hot streak. The position initially goes in his favor, but quickly reverses when large orders push the market lower. Forced to puke his position, he realizes he has lost all of the profit from his previous, winning trades. He is driven to regain the money and reenters the market, only to get slammed by a second wave of selling. He now feels like he has entered a cold streak and begins trading hesitantly, with reduced size. By the time the market closes, he is

down on the day and the week. He feels like a jerk for becoming overconfident after his gains.

No doubt you can detect a pattern in each of these situations. The individual is in a performance situation where he/she experiences pressure to succeed. The situation has taken on a distinct importance in the person's eyes, and now he/she is focused on the results of the performance—not just the performing itself. This dual focus—worrying or focusing on the outcome of performance while trying to stay immersed in the performance—is the common element behind all performance anxiety. Such anxiety is the single most common trading problem I have encountered in my interviews with traders.

How can traders reduce their level of performance anxiety? Here are a few strategies that I have found to be effective:

1. *Focus on process goals when thinking about trading, rather than profits/losses* – Traders like to set goals for themselves, yet often as not, monetary goals end up creating unnecessary pressures. More effective goals are ones that focus on the process of trading, such as limiting losses to two ticks if you're a scalper or holding trades until a trailing stop is hit. A nice mindset is, "If I just trade the right way, the profits will come." This takes much of the pressure off the performance.

2. *Tackle risk incrementally*. Risk places a psychological magnifying glass on situations and greatly increases the opportunities for performance pressure. A foul shot in the first minutes of a basketball game is the same foul shot in the final seconds of a tied contest, but there is a huge psychological difference. Traders who try to radically increase their size quickly find that the trade that worked out with 1 contract may not work with 10, because of pressures to (too) quickly limit losses or take profits. A gradual ramping up of size is far more effective than an impulsive leap for which one is emotionally unprepared.

3. *Step away from the screen*. The self-talk during periods of performance anxiety actually interferes with the accurate processing of market data, because the part of the brain responsible for perceiving and acting upon market patterns is not being activated. It is far better to step away from the screen and refocus on what the market is giving you than to act blindly on one's fears and compound an already-difficult situation.

4. *Use mental rehearsals to make threatening situations familiar*. This is perhaps the single most effective technique I have found for reducing and eliminating performance fears. By using guided imagery to repeatedly face threatening situations and mentally rehearse how one would like to respond, one can eliminate much of the stress when those situations actually occur. The goal is to so often face the performance fears in your mind that the coping response becomes automatic, like a habit pattern.

5. *Anchor mental rehearsals to distinctive mind states*. This is one of the best strategies covered in my book. By learning to place oneself in a state of unusual calm and focus, and then by repeatedly rehearsing coping strategies for threatening situations, a trader can create a link between the mental state and the coping response. When there is a stressful performance situation, all the trader needs to do is invoke the rehearsed mental state and the coping behaviors that have been overlearned will come to the fore. For instance, if you continually mentally rehearse a strategy for holding onto winning trades while sustaining a calm focus, recreating the calm focus **during** the next winning trade will make it easier to summon the self-talk and behavior associated with holding the position.

6. *Perform a mental checklist before trading*. Eliminating perfectionistic expectations at the start of the trading day can go a long way toward reducing performance pressures. Any time the word "should" enters one's thinking about trading, it's time to step back. "Shoulds" include internal demands to make a certain amount of money, to trade with a particular frequency, to make back money that has been lost, to not leave money on the table, etc. Because performance anxiety is often fueled by excessive self-demands, setting and affirming reasonable trading goals through the trading day can go a long way toward reducing performance pressures.

7. *Get a life*. When something becomes all-important, the pressures that accompany performance increase exponentially. Traders who trade for a living and who have little else going on in their lives are especially vulnerable to performance anxiety. If trading is your whole world and trading isn't working, it's going to feel like your world is collapsing. By placing one's self-esteem eggs in many baskets, traders can ensure that the inevitable drawdowns and cold periods will not disrupt their self-confidence.

I cannot emphasize strongly enough: Most traders who are convinced that they have deeply-rooted psychological problems or addictive trading patterns are actually caught in a vicious cycle of perfectionistic self-demands, increasing performance pressure, mounting anxiety, disrupted performance, and renewed self-demands to compensate for the failure. After a while, traders caught in such a cycle begin to doubt whether they will ever succeed. By addressing their problems at the source—the expectations that generate performance pressure—traders can often turn themselves around in a surprisingly short period of time.

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Science of Brief Therapy (American Psychiatric Press) is due for publication during the first half of 2004. Many of Dr. Steenbarger's articles and trading strategies are archived on his website, www.brettsteenbarger.com.

That Which Cannot Be Said

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Note: A version of this article was posted to the Trading Markets site on 1/30/06.

There are just some things that can't be said. Yes, we live in America and, yes, there's free speech and all that, but I'm telling you: Some things just cannot be said.

Like when you're shopping for a house. You can't just say to your real estate agent, "I don't want people of color, unassimilated immigrant groups right off the boat, or trailer trash. I want to live in a white, upper class neighborhood." No, that would be racist, narrow, bigoted, and in unspeakably poor taste. So instead you tell the agent you want "a very safe neighborhood with absolutely top-performing schools," and, voila, you wind up where you want to be anyway without having to speak what cannot be said.

Or let's say your son is harassed at school by an older kid and pops the bully in the nose. The school, of course, calls you over the incident and wants your reaction. What you can't say is, "I'm proud of Junior. I raise my son to be a man, and he gave the kid what he had coming." No, you patiently listen to discussion of "appropriate behavior" and reassure the teachers that Junior is no Columbine wannabe. Then, behind closed doors, you pat Junior on the back for his testicular fortitude.

The trading world is no different. There are certain truths you can't utter. Take the time a small group of currency traders contacted me for advice after they had yet another losing year. I asked many questions to diagnose their problems, one of which was, "How does your P/L break down as a function of time of day? Do you make or lose more money around the London open compared to the New York open?"

The line went silent for a moment.

It turns out the group didn't trade the European open. It didn't fit with their lifestyle to rouse themselves at 2:00 AM Central Time.

My error was to speak that which cannot be said. I told them ***they weren't succeeding at trading because they didn't deserve to succeed.*** Needless to say, that was my one and only consultation with the group leader.

What I should have said, of course, was that they could succeed if they only adopt a winning mindset and follow their trading plans with the aid of my expert coaching. Instead, I explained to the group leader that the feeling that one deserves to succeed follows from the long experience and effort required to master a field. After hours of

drills daily, Dan Gable's wrestlers not only felt confident of success; they felt they deserved to win. Having gone through Navy SEAL training and lengthy rehearsals of missions, elite soldiers feel that mastery is theirs. Confidence and competence must be earned, and staying away from periods of opportunity in the market are not the way to earn it.

The role of a good psychologist is to comfort the afflicted *and* afflict the comfortable. If you're comfortable in bed while your market is in its peak period of opportunity, you *shouldn't* be comfortable. I told the trader he didn't deserve to succeed for the same reason I'm writing this article: to create a test. I wanted to put a mirror in front of his trading so that he would either close his eyes or squarely face what he saw.

Gable, as both wrestler and wrestling coach, knew the value of afflicting comfort: "I'm a big believer in starting with high standards and raising them. We make progress only when we push ourselves to the highest level. If we don't progress, we backslide into bad habits, laziness and poor attitude."

The approach at West Point is similar. Cadets who fall short are allowed one of three responses: "Yes, sir"; "I don't understand, sir"; and "No excuse, sir".

Successful performers--whether in trading, sports, or performing arts--start with high standards, raise them, and then--after falling short--look in the mirror and say, "No excuse".

No, you can't make a living telling people they don't deserve to succeed.

It's just one of those things that can't be said.

Except by those who eventually do succeed.

Bio:

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Ask the Doc: Overcoming Market Panic

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When I was a beginning trader, I naively believed that a 100-share trade was no different from a 10,000 share one, since both could be executed with the same entries, exits, and money management. What I failed to appreciate is that the risk of any trade or investment affects our ability to evaluate it calmly, rationally, and objectively. A head of a brokerage firm, which offered free simulated trading to new traders, once told me that 80% of the traders made money in the (very realistic) simulations, but only 20% were successful once they traded real money. The difference, he observed, was the emotional impact of having actual money on the line.

In this same vein, a reader asks the Doc:

When I was younger and fitter I played soccer. My skills were okay, but I tended to panic when I possessed the ball and heard the opposition hurtling towards me.

Unfortunately I've carried this kink in my think over into my share trading.

I love trading. I've been learning and applying in earnest for the past year and have managed to overcome several barriers. However, three times I have panicked during a broad market sell off and sold out as I watched my paper profits disappear.

The latest example was yesterday. I'd struck a purple patch recently and the paper profits were looking very healthy. However, my positions began retracing without hitting my stops and those paper profits disappeared like sand slipping through my fingers.

When the market dropped yesterday, I found this too much to handle and I sold out at just above break even!

I know I won't be a good trader until I learn a few strategies to conquer this these panic attacks.

I have a few observations and suggestions for our earnest and motivated trader. But first, let me ask you—the reader—to review what he wrote and identify what *you* think is the most important thing he said. One way of doing that is to figure out what you would first ask him if you were counseling him directly. Would you inquire about:

- The soccer experience

- His emotional reaction to sell-offs
- Yesterday's market incident
- His desire to be a good trader
- Or something else?

My first question to our trader would be "something else". I would say to him, "That's interesting; you say you've managed to overcome several barriers. Could you tell me about those barriers and how you overcame them?"

Why would I ask this? Simple: *Whatever he did to overcome his earlier barriers may hold the kernel of a solution for his current dilemma.* Those solutions reflect the genuine and unique strengths of each individual. Instead of focusing on the problem and unwittingly reinforcing the notion that ***he*** is the problem—Note how easily he jumps from the issue of handling sell-offs to the larger, personalized problem of "I know I won't be a good trader"—it makes sense to apply his known strengths to the challenge at hand. This reinforces the important message that *even very good traders face huge hurdles to success.*

This approach is known as solution-focused brief therapy, and it is particularly effective as a change strategy for those of us facing normal life dilemmas. Let's say you come to me with a trading issue and I find out that you recently worked out a marital problem. You and your spouse learned to be better listeners by not taking disagreements personally and, instead, using them to identify each other's needs and desires. Right away, we might then take a look at **how** you've been able to listen to your spouse and **how** you became able to not take differences personally. Perhaps this same strategy could work when it comes to listening to the market and not allowing your self-esteem to ride the market's ups and downs!

The working assumption of the solution-focused therapist is that somewhere, at some time, each of us has successfully dealt with situations that are similar to the present dilemma. Depressed people aren't always depressed, so how about finding out what they're doing when they're feeling better about themselves? Couples with problems don't always argue; what are they doing right when they're getting along? And our trader is not always panicking in the market, even when markets don't always move his way. It would be worth identifying what he's doing during those times: ***the kernels of solutions are often hidden in exceptions to problem patterns***.

As it happens, I faced a dilemma much like our trader's early in my trading career. I became panicky whenever I increased my size, as even normal movements against my position felt too risky. I overcame that problem when I examined how I handled risk in other areas of my life. For example, whenever I tackled a new project as a psychologist, such as writing a journal article, I always made sure that there was a guaranteed home for the article before I had finished it. I did this by consulting with editors ahead of the writing. My logic was that, by securing my publication, I could free myself to focus on the process of writing.

Similarly with trading, I learned to take guaranteed profits when positions went my way. Once a trade moved in my favor by the amount I was willing to risk on the trade, I immediately created a trailing stop on the position that guaranteed a profit. As a result, a winning trade could never become a loser. As the position moved in my favor, the stop moved with it, locking in an increasing profit. The security of knowing, "This trade will be a winner, no matter what" provided the reassurance I needed to counteract fears of risk. In my work with high frequency traders, I've used the same rationale to create trailing stops on *daily* profit/loss, so that, once the trader is up by a certain amount of money during the day, the stop point for the trading session is moved to a level of assured profitability.

My solution may not be yours; the beauty of solution-focused counseling is that it allows each person to craft solutions based on *their* experience—not the abstract advice of a guru. If you can identify the occasions when you're *already* a good trader, the chances are good that an analysis of those occasions will start you on the road toward solving the next market challenge.

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Trader Development: Aligning the Head and the Heart

Brett N. Steenbarger, Ph.D.

Note: A version of this article was submitted to the Trading Markets site on 11/11/05.

I had the recent pleasure of chairing a panel presentation a couple of days ago at the Futures Industry Association Expo in Chicago on the topic of trader development. My distinguished colleagues, Tom Rice of Goldenberg Hehmeyer & Co. and Doug Hirschhorn of Sperling, LLC, and I drew upon our many combined years of hands-on work with professional traders to identify "best practices" in trader development. If I had to put my finger on an overarching theme of our presentations, it was that the trader development process is one in which traders learn to align their heads and their hearts. First traders know what they should do, but only later does it become part of them and their feel for markets and trading.

Research on the development of expertise indicates that skilled performers first obtain a body of knowledge about their field and only later develop an intuitive feel for its performance. For example, medical students typically spend their first two years studying basic science information, learning about how the body works. Their last two years apply this information at the bedside, as they learn how to integrate this information with data from histories, physicals, and lab tests in generating diagnoses and treatment plans. By the time they graduate from their residency programs, they have had so much contact with configurations of symptoms and diseases in their field that they develop a feel for patients and arrive at correct diagnoses much more rapidly (and often) than they did in medical school.

One way I, as a trader, align head and heart is to supplement my intuitive feel for the market with pattern-based statistical studies that tell me when there is--and isn't--an edge in the market. For example, on Thursday we saw the S&P 500 make a four-day low early in the trading session and then rally sharply to make (and close at) a multi-day high. I went back to January, 1995 (N = 3994 trading days) and found that such reversals only occurred 19 times in the S&P. My goal was to see what happened within the four days following that reversal. For the sample overall, we had 2206 four-day periods up and 1788 periods down for an average gain of .15%. After the reversals, we had 8 four-day occasions up and 11 down for an average loss of -.46%. Clearly, the reversals, as a group, did not provide a bullish edge. If anything, were more likely to reverse than continue.

Knowing this by itself helps me maintain discipline. Instead of becoming excited about the upside breakout and coloring my market perspective with the most recently occurring event, I can sit back and watch how the market trades. The information acts as a brake to

any impulse I might have to jump aboard new highs. If I see continued market strength, I can wait for pullbacks to ride that move. If I don't see that strength, however, I will look for occasions where buyers, whose action is manifested in the NYSE TICK, cannot push the market higher and then fade their optimism.

As my colleagues on the panel illustrated, there are many techniques for helping traders align their heads and hearts. The use of research to guide one's market views is but one of them. The important thing is that traders find for themselves the methods that will further their own development by making what they know what they feel.

Bio:

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Changing How We Cope

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In my last article, and the first of this two-part series, I introduced the topics of stress and coping. We saw that stress is intrinsic to trading--and to all activities that involve high degrees of risk and uncertainty. Whether this stress becomes chronic distress, however, is a function of our coping. People utilize a variety of coping styles, including emotion-focused, problem-focused, and avoidant strategies. These methods for dealing with threat are neither good nor bad in and of themselves. Most often, when they are problematic, it is because they have become fixed and rigid. At one time in life, they may have served a useful purpose. Now, however, they bring unwanted consequences.

Many traders are aware of behavior patterns that consistently lose them money and can't understand why they repeat these patterns despite their awareness. This is the fundamental dilemma that brings people to psychologists: *knowing your problem patterns is necessary for change, but not sufficient*. Addicts, for example, are typically quite aware of their problems. What waxes and wanes is their emotional connection to the consequences of these problems. To some degree, we are all addicts: we act on habit. Knowing our bad habits and sustaining the awareness to avoid and change them are very different challenges.

Often, frustrated by their inability to change their patterns--and the perverse tendency to repeat costly mistakes--traders become armchair psychologists and conclude that they harbor, deep within themselves, a desire to fail. Repetitive patterns *are* self-defeating, but this doesn't mean that traders have a hidden urge to do themselves in. In fact, just the contrary: As we saw in the first article, problem patterns often began as healthy coping efforts during an earlier life period. This is why they are so resistant to change: they have been overlearned precisely because they *did* work so well for a considerable period of time. Imagine the trader who grew up in an alcoholic household filled with conflict. Fearful of being drawn into the strife, he learned to bottle his emotions and withdraw from heated situations. Now, as an adult, he no longer lives in such an environment, but bails out of trades at the first hint that they are moving against him. This consistently loses him money, and--feeling like a jerk--he wonders why he so often sells the lows. He doesn't recognize that the feelings evoked by the losing trade are sufficiently similar to the emotions of the past that they trigger the old methods of coping.

So how can we change these overlearned coping patterns? Although the particulars of each person's change process are different, the structure of change is remarkably consistent. Three stages appear to be essential to change:

1) ***Pattern recognition*** - In some ways this is the most difficult of the stages. It is not possible to change a pattern unless you can recognize its appearance in real time. For this reason, many therapists have their clients keep journals in which they observe situations that trigger problem patterns and the correlates and consequences of those patterns. By keeping detailed records, for example, you may find that your pattern of impulsive, revenge trading after a loss is preceded by a high degree of muscle tension and verbal expressions of frustration. This allows you to use the tension and venting of emotion as cues for recognizing that your old pattern is about to repeat. Adding a log of your emotions and behaviors to your trading journal is extremely helpful in helping you see the patterns that set you up for success and failure.

2) ***Pattern interruption*** - Once we become familiar with the triggers and cues associated with problem patterns, we may not know what to do instead, but we can actively choose to not repeat the pattern. If my pattern is one of anger outburst and impulsive action, I can choose to walk away from the situation and gain a new perspective. This is often most effectively accomplished by interrupting the pattern with vivid reminders of the consequences of those patterns. For instance, an alcoholic might rationalize that it's ok to go to the bar with friends, but will intercept the "stinkin' thinkin'" and remind himself that his last relapse began exactly that way. By getting in touch with the consequences of that last relapse (or that last bad trade), a person turns the motivational tables and puts the brakes on automatic behavior patterns. I often tell my clients that "You will begin to change when you consistently *hate* your old ways." Once you make the problem pattern an enemy and vividly remind yourself of all the ways it has cost you money and grief, it is much easier to interrupt its future appearance.

3) ***Pattern substitution*** - After interrupting a pattern, it's necessary to try something different. The alcoholic of our above example might choose to visit a friend or talk with an AA buddy rather than go to the bar. A frustrated losing trader who is tempted to put on larger trades to make her money back might instead take a break from the screen and engage in biofeedback exercises until she is calm and focused. *The goal is to take the triggers of the old coping pattern and turn them into triggers for new, more constructive coping.* Imagery and mental rehearsal are excellent ways of building new patterns for substitution. Before the trading situation starts, for example, the trader might purposely visualize--in great detail--a market scenario that has recently caused emotional havoc. In her mind's eye, she will watch himself feel tempted to make the same mistakes, but then visualize herself interrupting this urge and engaging in a better trading behavior. By rehearsing the desired trading behavior before the market session and looking out for triggers during the session, the trader tilts the odds in her favor that she will be able to extricate herself from her old ways.

The key to making this work is repetition. You want to turn your desired behavior patterns into habit patterns. Motivation is important when you first make changes, but

eventually you don't want to have to muster your motivation every time you want to do the right thing. You want the right behaviors to occur naturally. This means that good trading behaviors need to be repeated so many times that they become overlearned. Mental rehearsal can accelerate this process, but ultimately we need to work the change process every day in real time circumstances. Every trading day offers you an opportunity to repeat old mistakes or to make changes. If you focus on personal change, you can't guarantee that every market day will make you money, but you *can* ensure that every day will be profitable.

Bio:

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Changing Your Mind

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The following is an excerpt from The Psychology of Trading (Wiley, 2003).

Our normal states of mind, which define most of our daily experience, lie within a restricted range of our possibilities. Your immersion in daily routine keeps you locked in routine mind states. This traps you in problem patterns that have been anchored to these states. The heart of counseling is the introduction of new, constructive patterns during times when a person is operating outside of their emotional, physical, and cognitive norms. Attempting different change techniques—such as positive imagery or self-talk—is unlikely to succeed if those techniques are administered during periods of normal, routine functioning. The psychological techniques that are most powerful in accelerating change create positive traumas, providing new experiences during extraordinary states of cognitive and emotional processing. Ordinary human consciousness—not necessarily any abnormalities associated with mental disorders—is the enemy of profitable trading.

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Coping With Risk and Uncertainty

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How do you cope with the risk and uncertainty that are built into markets, and are you coping effectively? In this and my next article, I will be tackling these important questions.

The topic of coping actually begins with the notion of stress. Stress is a characteristic set of physiological, cognitive, and emotional responses to threat. Generally, these responses speed up such bodily functions as heart rate, galvanic skin response, muscle tension, and rate of respiration. For this reason, the stress response has sometimes been called the "flight or fight" reaction. In the face of threat, our bodies prepare us for action: either to attack the source of danger or to run from it.

What constitutes a source of stress is highly dependent upon our perception. If we define something as a threat, we will experience it as threatening, and that will trigger a stress response. For some people, public speaking is an everyday activity, not to be feared at all. It might even be something enjoyable. Others view public speaking as a potentially humiliating event. Their perception of threat triggers the stress response that we call performance anxiety. Cognitive psychologists, however, remind us that it is not the public speaking event itself that is generating the anxiety, but rather our processing of that event. Take away the perception of threat and the anxiety diminishes.

Some of us view the world through lenses that emphasize the threat in life events. Perhaps we grew up in an unstable home, perhaps we were overprotected and never experienced life's hard knocks, or perhaps we learned to anticipate negative events as a way of handling multiple setbacks during a difficult period of life. All of these scenarios can lead to situations where stress becomes a way of life. Once we acquire habitual thinking patterns that emphasize life's dangers, we fall into a chronic mode of flight or fight. Continually mobilized, we can experience ongoing high blood pressure, muscle tension, and jitteriness.

Psychologically, chronic stress is experienced as dis-stress. Anxiety, depression, and anger are common consequences of viewing the world through the lenses of threat. These emotional reactions, in turn, produce typical behavioral consequences, such as indecision, lack of self confidence, impulsivity, and interpersonal conflict. We know from cognitive neuroscience research that high levels of distress shift regional cerebral

blood flow away from the frontal cortex--our executive center of judging, planning, and reasoning--and toward motor regions. This is why it is so difficult for people under chronic stress to calmly work out their problems. Their perceptions of threat create physical and emotional arousal, which in turn make it difficult to access the cognitive capacities most needed at those times. Every trader knows how easy it can be to abandon a well thought out trading plan in the heat of adverse market activity!

The term coping refers to the actions we take to deal with sources of threat. Broadly speaking, there are three coping styles:

1. *Emotion-focused coping* - Dealing with dangerous and threatening events by processing one's emotions and engaging others for support;
2. *Problem-focused coping* - Handling threats by focusing on the situation and ways of dealing with it to reduce danger
3. *Avoidant coping* - Avoiding sources of threat or choosing to not think about or deal with a problematic situation.

None of these coping styles are good or bad in and of themselves. Each can be used effectively, and each can be misused. We know that a coping style is effective when it reduces threat and produces positive outcomes. There are times when it can be effective to sort out our feelings and deal with these, such as after the loss of a relationship. There are occasions when it is very helpful to be problem focused and directly deal with an immediate emergency. Other times, we need to suppress feelings of upset and problematic situations in order to get by in a job or as a parent. In many respects, the best coping style is one that flexibly incorporates all three ways of handling situations.

While all of us do cope at times by dealing with feelings, attacking problems, and removing ourselves from situations, most of us have characteristic ways of dealing with threat. Those are our typical coping patterns, and they are integral to our personalities. For instance, if I have a significant problem, I very often will cease interaction with others and become extremely task focused. At such times, my attention narrows considerably and is concentrated on the problem at hand. This is useful in that it generally accelerates the resolution of the problem. It is not useful in other respects, particularly if it leads to others feeling shut out in a team-based work situation. If I become locked into particular ways of coping that worked for me in one setting--or during one period of life--and then bring these to new situations, there is a real risk that the coping will no longer ward off threat and may even create new conflicts. My colleagues at work who feel shut out by my problem focus, for example, may stop collaborating with me at times when I want and need their assistance.

This situation is much more common than people realize, and it is a source of untold trading problems. Coping strategies that worked well at one time or in other situations are brought into the trading arena, where they wreak havoc. Very often this occurs when the emotions evoked by our perception of trading situations (perceptions of failure, danger, invincibility, etc.) trigger coping actions from an earlier life period where those emotions were problematic. Perhaps, for example, I felt like a failure in my growing up

years because I could not make friends or develop relationships. This led me to cope by avoiding social situations and retreating into my own fantasy world where I didn't have to deal with others. As a child, this may have helped me through a painful and awkward life period. Now as an adult, however, responding to market losses with feelings of failure--and then retreating into fantasy--is not constructive.

Very often, our most problematic coping occurs when we deal with threatening situations in ways that greatly differ from our normal coping styles. During normal trading, I might be highly problem focused. In a volatile stretch of trading where I take large losses, however, I find myself coping by exploding emotionally and then feeling guilty over my outburst. Such out-of-the-ordinary coping generally is a sign that an earlier coping mode is being activated. Something about the day's trading is triggering old memories, feelings, or conflicts. As a result, we're no longer using our constructive, adult coping capacities. Instead, we're mindlessly repeating a pattern from the past.

If you find yourself overreacting to a situation, there's a good chance it's not really an overreaction. You are reacting to the situation--*and* to something previous in your life that is being stimulated by the situation. The first step of progress you can make in this circumstance is to remind yourself that you're not really reacting to the situation at hand. "This isn't about trading," you tell yourself. "Something else is going on." Such a reminder does not, by itself, eliminate the threat response, but it starts the process of putting threat in perspective. That is important. Remember: threat--and stress--are functions of perception. As you alter your perception, you alter your responses.

In my next article, I will focus on some ways of modifying stress responses and improving coping. Until then, I invite you to join me for a free online chat that will cover stress, coping, and much more. The Hotcomm session is sponsored by Woodie's CCI Club and will be held Thursday, October 20th at 5:00 PM EST (4:00 PM for us Chicago types). If you're not familiar with Woodie's group, I heartily recommend you check it out. You'll find hundreds of traders helping traders. And that, after all, is a pretty effective way of coping!

Bio:

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Dead But Dreaming

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"The most merciful thing in the world…" H.P. Lovecraft writes in his horror story *The Call of Cthulhu*, "is the inability of the human mind to correlate all its contents." To be sure, if all our memories and perceptions registered in the mind equally, we should be like the unfortunate Funes of the Borges tale—completely overwhelmed by the sum of our experiences, unable to act. Yet, as Freud realized, we pay a price for this compartmentalization. The conflicts, urges, and passions that we sacrifice in the interest of present concern do not merely vanish. Like Cthulhu, they lie beneath the depths; in the apt phrase of The Fields of the Nephilim, "dead but dreaming". They call to us when our emotional stars are aligned, waiting for the time of their release.

Those stars are aligned when we experience "triggers": situations sufficiently similar to initial traumas and travails that they reactivate memories—and earlier modes of coping. This is a most important concept within depth psychology. Every current problem represents a mode of coping from the past that has long since lost its usefulness. Perhaps as a child I felt humiliated by my siblings and their emotional abuse. Whenever I tried to prove myself to them, they beat me down with taunts and physical threats. My only coping, as a younger, smaller child, was to withdraw in silence so that I would not incite them to a physical expression of their hostility.

Now I am an adult, trading the financial markets, and I am eager to prove myself in this most challenging arena. Trade after trade I experience losses and, before long, I retreat to my psychological shell, passively watching as the market ultimately moves in the anticipated direction. "Why didn't I take those trades?" I wonder after the close, bemoaning my inability to "pull the trigger". Later, I find myself even more frustrated, as the prescribed self-affirmations and visualizations of trading coaches fail to dent my dysfunctional pattern.

Perhaps the most perplexing aspect of this scenario is that I can **know** what to do during times of sober reflection. In the heat of trading, however, when those emotional stars are right, my past coping is activated—and it is as if I become another person! If there is anything more horrifying than the prospect of encountering Dagon-like creatures in the seas, it is finding oneself dominated by an internal Cthulhu, with no prospect of escape. As long as I experience market losses as humiliations heaped upon my hopes for self-assertion, part of me will protect myself from emotional pain through withdrawal—even as I yearn to pull that trigger. The only way to trade better in such a situation is to find a way to reprocess market events.

The key to such reprocessing is to make the trigger events familiar and non-threatening. Something that we encounter time and time again tends to lose its emotional

valence, much as repeated jokes are drained of their humor. Some depth psychologists believe that repetitive dreams—and the Freudian compulsion to repeat past problem patterns in the present—are the mind's attempt at self-healing, promoting self-mastery through a reworking of those patterns. We needn't wait for our stars to be right to attempt this reworking, however. Rather, we can align those stars ourselves—activating the very triggers that thwart our planning and judgment—and learn to process them afresh.

The practical steps in this reprocessing are straightforward:

1. As Gurdjieff recognized, the work begins with self-observation. Before we can reprocess the triggers that activate past behavioral patterns, we need to know what those triggers are. Careful recounting of the thoughts, events, and feelings preceding problematic periods will generally yield patterns: recurring situations that are associated with the seeming shift in personality. Many times these trigger situations will be accompanied by a shift in our physical and emotional state: a sudden rush of frustration, anger, hopelessness, or excitement. Maintaining a personal journal can be very helpful in tracking the situations and state shifts associated with our triggers.

2. Once we recognize our most difficult triggers, we want to face them—but only in a fresh manner. This means invoking a state of thought, physical arousal, and emotion that is contrary to the ones normally triggered. Teaching oneself to become highly relaxed and cognitively focused through deepened, rhythmical breathing and concentration on a single stimulus is highly useful in this regard. It provides a relatively non-emotional, controlled state that, with practice, you can enter at will.

3. When you have gotten to the point of being able to enter a calm, focused state, you then use guided imagery to place yourself in situations that you've highlighted in your journal. The key is to make these mental rehearsals vivid—as if you are truly reliving them. While experiencing these events in imagery, you are focusing your mind and slowing and deepening your breathing as you have been practicing. The goal is to stay calm and focused, even as you are contemplating the most emotionally challenging circumstances.

4. From there, it is a matter of repetition: creating endless variations of the scenarios from your journal and systematically reprocessing them. Once you are able to encounter these situations without emotional arousal through the use of imagery, you are then ready to bring your focusing and deep breathing into life events as they occur—facing your triggers in real time, while keeping yourself under control. This, too, requires repetition,

but with repeated success comes confidence and a heightened sense of control.

Freud realized that the basic problem with people is that, to the extent that they are dominated by past patterns, they lack a truly free will. "Where id was, there ego shall be," was his formulation of the idea that self-awareness is the philosopher's stone that unlocks our inner gold from its base surroundings. The alchemist Theobald von Hoghelande recognized this in 1594 when he declared, "The art requires the total man." So it is with the art of trading. The exclusive focus on profit and loss triggers our fears over success, failure, inadequacy, gratification, and self worth, making alchemical "puffers" of us all. The philosopher's stone is within: in the realm of a liberated will. A small footnote to Elizium, taken from the Chaldean Oracles, advises:

Stay not on the precipice with the dross of matter, for there is a place for thy image in a realm ever splendid.

What have I learned as a trading psychologist? Just this: In newly revisiting the nightmares of our depths, we become more total; more capable of Will. To find one's purpose and passion in life and yoke it to an unfettered will: what greater and nobler challenge could there be? "Love is the law, love under will," was Crowley's formulation: the ideal of placing passion in the service of one's capacity for directed action.

Gurdjieff emphasized that effort is the currency with which we purchase our will's development. Yet without adversity and challenge, there is no need for effort. Imagine a universe without gravity. Our muscles would never develop, as nothing could possibly test—and develop—their strength. It was Colin Wilson's seminal insight that human beings need emotional gravity for self-development. This is the purpose of all suffering, great and small: to provide the counter-forces by which we can develop the muscles of will through directed effort. It is human nature to avoid suffering: to consign it, like Cthulhu, to the depths. Yet there it lies dead but dreaming, entering our thoughts and actions, refusing to accept banishment.

How ironic it is that we overcome suffering by embracing and facing it, ferreting it out and repeating it so often that its voice is stilled! It is as if our worst fears and memories are crying out, "Smother me or suffer": immerse yourself in me, rework me, or be dominated by me. The markets pose us with obstacles—and even suffering—on a regular basis. In their complexity and uncertainty, they offer unparalleled challenges to our ordered minds. Facing those challenges, we face ourselves, and become ever more the total individual, the true discoverer of the philosopher's stone. Mercy grants us limits in correlating the contents of our minds; providence provides for the possibility of achieving ever-greater correlation.

Brett Steenbarger

This article is my way of acknowledging the many philosophical, spiritual, and musical influences on my work. With the help of Google and the direct and indirect references in this article—and their direct and indirect references—you, like Borges, can be well on your way toward discovering the Library. Sweet dreams…

Destructive Patterns in Trading

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Before we get into the topic of destructive trading, allow me to explain how psychologists assess whether or not a person has a problem with alcohol consumption. Here are ten questions that a professional might ask in order to assess any kind of substance use disorder, including alcohol abuse:

1) Have you found that your drinking is bringing unwanted, negative consequences?
2) Have you recently felt guilty over the way you have been drinking?
3) Do you find you need to drink more just to get the good feeling?
4) Do you find that your personality changes when you drink excessively?
5) Do you find it difficult to take a break from drinking, even when part of you knows that this would be best for you?
6) Do you find yourself drinking to feel good about yourself?
7) Do you sometimes feel that you cannot control how much you drink?
8) Do you find yourself getting angry when someone close to you questions your drinking?
9) Do you find yourself vowing to limit your drinking, only to slip back into overdrinking?
10) Do you find it difficult to not drink given the opportunity, even when the occasion is not really appropriate?

Now for the topic of destructive trading: ***Please answer the above questions, but substitute the word "trading" for "drinking", and substitute the word "trade" for "drink".***

Fear and greed are potent influences on trading, but the greatest trading problems, I find, are addictive in nature. Successful traders really want to trade; they have a passion for trading. Addictive traders **need** to trade; they have a passion for action and excitement.

An addictive trader will not manage his risk. That is because risk is part of the high.

An addictive trader will not stop trading, even when losing money. That is because action, not profit, is the goal.

An addictive trader will cycle between periods of guilt and responsibility and periods of excess and irresponsibility.

Good traders trade actively. Addictive traders overtrade.

If you see yourself in this profile, do the right thing, before your patterns ruin your career and harm those who depend on you. Get help. You **can** change. Your trading and your happiness lie in the balance.

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Experts, Novices, and Trading Performance

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A large body of research examines skilled performance in various fields by comparing experts with novices. These fields range from athletics (both team and individual sports) to chess to various performing arts. Having now read scores of books and research studies on the topic, I see where much of this research could be of value to traders seeking to achieve their own levels of expertise.

A book that I am planning for 2006 will chronicle these investigations--and their implications for trading--in considerable detail. This article will focus on one particular finding of interest from studies on expertise in medical diagnosis: the differences in reasoning styles between accomplished professionals and neophytes.

Having taught in a medical school for 19 years (and having traded stocks and equity indexes longer than that), I can vouch for the similarities between arriving at medical diagnoses and coming up with trade ideas. Both involve an initial absorption of detail, followed by a comparison of the details with known patterns, and then a sharpening of one's ideas prior to taking action. Traders and physicians alike bring with them mental maps of familiar patterns based upon didactic learning, research, and personal experience. In that sense, a trader's assessment that we are moving higher is not so different from a psychologist's diagnosis of an anxiety disorder. The trader knows what trending markets look like--including certain configurations of price, volume, and volatility--and the therapist has an internal representation of anxiety disorders. Pattern search following careful observation is crucial to their expertise.

It turns out in the medical expertise literature that novices (such as beginning medical students or laypeople) lack the internal representations of experienced professionals and thus have a harder time making sense of the data they collect. Such novices will collect blood test results, physical findings, and data from the medical history in a far more haphazard fashion than experts, creating both inaccuracies and inefficiencies. Most crucially, the novices employ what researchers call "backward reasoning": they jump from initially presented information to diagnostic impressions and then move backward from their impressions to identify data that support their views. For example, an inexperienced psychology student might observe low energy in a patient and leap to the impression of depression. From this impression, the neophyte therapist would ask questions that would be relevant to mood disorders generally and depression specifically.

Expert doctors, however, do not function this way. They employ "forward reasoning". They collect a wide range of data that are relevant to making differential diagnoses. Instead of jumping to a single conclusion, they have in mind several possible conclusions and collect the data needed to distinguish among them. Thus, for instance, the expert therapist would seek a blood workup and a full history and physical to accompany the usual psychosocial questions regarding mood. This is because the expert knows that low energy in a patient can be the result of hormonal imbalances, nutritional deficiencies, and disease processes--not just depression. Where the novice works backward from an initial impression, the expert assembles large amounts of data into clusters and narrows hypotheses until the best one remains.

It is not unusual for traders to become married to market opinions: They get an idea in their head where they think the market is going and then they ignore information that tells them otherwise. I have watched traders selectively pick information from markets that confirms their biases while ignoring huge trends that are contradicting their ideas. Only after their markets close do these traders look back and wonder how they could have missed what was so obvious.

I contend that the trader who is married to an opinion is behaving like novices in the medical expertise studies. They form an impressionistic view of their market and then search for evidence to support their bias. Expert traders, however, "let the market come to them": they gather enough information to sort out random movement from significant tendencies, eventually arriving at trade ideas that represent their diagnosis of the market. New traders, I've found, are like medical students in that they haven't received enough training and seen enough variations of patterns to know how to assemble data into differential diagnoses. Only with repeated experience do they learn to identify meaningful clusters of information and use these to sort plausible ideas from implausible ones.

If this is true, trader education might need to more closely approximate medical education. Traditional medical education consists of a pre-clinical phase that teaches basic science fundamentals, so that students understand principles of anatomy, biochemistry, cell and molecular biology, pathology, and the like. After this comes a very different clinical phase where learning is at the bedside, with students encountering a variety of clinical cases and "reading up" on these. Traders, too, need a basic education in the fundamentals of auction markets and statistics, so that they understand the significance of bids, offers, volume, and price levels and patterns that appear over time. After the basics, however, traders learn at their equivalent of the bedside: by viewing markets under varying conditions and looking deeply into these.

Ultimately, what physicians and traders learn is not just a fund of knowledge, but a method of reasoning. What makes a good trader may come less from the trade ideas themselves than from the forward reasoning process used to generate these ideas. Traders who keep journals and work on their performance may want to think about monitoring more than their moods, trades, and profits/losses. They also need to think about their thinking.

Bio:

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Explaining Market Success

Brett N. Steenbarger, Ph.D.

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Numerous books have been written on the topic of trading success. Nevertheless, it is unclear how expert traders obtain their expertise. Several explanatory models are implicit in market writings:

1) *The psychological model* – What makes great traders, this model asserts, is self-mastery. Great traders don't necessarily possess better trading methods or secrets, but apply common wisdom more consistently, with less emotional interference, and therefore with better risk management. Developing trading expertise is a function of developing oneself in this model.

2) *The scientific model* – What makes great traders according to this model is superior research. Markets exhibit cause-effect relationships, and these relationships shift over time. The role of research is to uncover these patterns and capitalize upon them. Such a model is, in a sense, the opposite of the psychological model. It hypothesizes that, once you discover inefficiencies in the marketplace, these can be incorporated into mechanical systems that eliminate any troublesome human elements from trading.

3) *The hidden pattern model* – Success in the marketplace, this model emphasizes, is a function of understanding. Patterns exist in the marketplace that do not shift over time, but also that are not necessarily observable on the surface. The role of the great trader is to successfully decipher and apply these universal patterns. This is not so much a function of research as experience; such approaches to trading as charting, Elliott Wave, and Market Profile are not systematic approaches to trading, but instead rely on the trader's interpretive skill.

4) *The performance model* – Trading is viewed as a performance activity, like athletics, in this model. Successful trading can be broken down into component skills and aptitudes that can be honed through intensive exposure and practice. Expertise is less a function of explicit research or pattern-based interpretation as rapid execution of perceptual and motor skills.

No doubt each of these models possesses elements of the truth, and it is quite possible that all of these models represent a portion of what it means to be a great trader, not unlike the descriptions of the elephant offered by the proverbial blind men. Models one and four emphasize qualities of the trader; models two and three stress the underlying qualities of the marketplace.

In a sense, these models are like lenses that traders wear, shaping how they view the world and prioritizing what they work on. They reflect deep belief structures about the nature of the world: whether reality is fixed (capable of being captured by universal patterns) or changing (capable of being captured through ongoing research); whether knowledge is explicit (obtained through psychological reflection) or implicit (reflected in performance).

Because these models of market success are drawn from our fundamental views of the world, I suspect that they are far less amenable to modification than is commonly appreciated. A researcher will be turned off by Elliott Wave theory not because of objective evidence (which the researcher finds lacking and the Elliotician sees aplenty), but because the very notion of fixed, unchanging Platonian realities does not mesh with a perspective that emphasizes dynamic interrelationships. To a trader who views trading expertise in performance terms, the idea that success is a function of mindset simply does not register: Can one become a good surgeon through self-development? And yet can one perform without the right internal harmony (as the recent experience of the Los Angeles Lakers demonstrated)?

Perhaps the successful trader differs from the unsuccessful one, not because of the superiority of one model over another, but because he or she has found a model for professional development that fits with his or her basic personality, outlook, and experience sets. The unsuccessful trader may lack a coherent model altogether—impulsively shifting from working on self to working on market, working on research to working on discretionary interpretation. Or unsuccessful traders may pursue models that utterly conflict with their fundamental personalities traits and life experiences, as in the case of intuitive individuals who attempt to force their trading into mechanical schemes.

In that sense, the models are like religions: There may be multiple paths toward spiritual growth, but it is necessary to find a path that speaks to you. One cannot be a devout Christian one day, a disciplined Zen practitioner the next, and still later an Orthodox Jew. By asking fundamental questions—Where is opportunity in the marketplace? What competencies do I need to capitalize on this opportunity?—you can begin to grind your own lenses and formulate a plan for furthering your success.

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Expose Yourself!
A Powerful Technique for Breaking Emotional Patterns in Trading

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The following is a draft of an article that appears in the October, 2002 issue of SFO Magazine (www.sfomag.com).

Traders love patterns. We trade chart patterns, oscillator patterns, historical patterns, cyclical patterns—you name the pattern, chances are there's someone trading it. Much of trading boils down to pattern recognition and the ability to quickly identify and act upon profitable patterns as they occur. This is particularly challenging for active futures and options traders, who must read the patterns, make their decisions, and place their orders within a matter of seconds. Processing market patterns in the midst of our own emotional patterns—our tendencies toward impulsivity, hesitation, frustration, and regret—is one of the greatest challenges of active trading.

It is always sobering for traders to realize that they are every bit as patterned as the markets they're trading—and sometimes far more so. In this article, I will draw upon two decades of experience as a clinical psychologist to illustrate a powerful technique for interrupting and changing repetitive emotional and behavioral patterns that disrupt trading. The technique is a cognitive-behavioral method known as exposure, and—in the Ranger tradition described by Brace Barber, Linda Raschke, and me in September's issue—it is a powerful tool for challenging oneself for exemplary performance.

Becoming Your Own Therapist

Extensive studies by Axel Cleeremans and Arthur Reber suggest that, with sufficient experience, people can learn to read patterns in data and anticipate future data sequences. Interestingly, this pattern recognition is intuitive and implicit rather than verbalized: *we know things long before we know we know them.* Such findings contradict the common belief that successful trading requires an elimination of emotions. Our feelings, like market data, consist of relatively weak—but vitally important—signals in the midst of considerable noise. Our sensitivity to market patterns often remains hidden amidst the pushes and pulls associated with trading fears and ambitions. *Traders can learn to become their own therapists by using techniques such as exposure methods, not to dull or eradicate emotion, but to gain control of their cognitive worlds and better extract signal from noise*.

The problem, you see, is not simply our patterns of anxiety, guilt, anger, or discouragement. *The problem is that we cannot control these patterns.* No one consciously plans to fail to pull the trigger on a promising trade; nor does anyone want to impulsively leap into a non-trending but volatile market before evidence of a breakout is at hand. As I emphasize in *The Psychology of Trading* (Wiley; January, 2003), such

emotional and behavioral patterns play themselves out against the will of the trader, in spite of our best-laid trading strategies and sophisticated market research.

For most of us, the scenario is embarrassingly familiar: We make plans to get into shape, to diet, or to treat others better—and what happens? All too easily, we lapse into our ruts. At the time we make our resolutions we are sincere. But under the influence of old patterns, the resolutions lose their force. The plans that we had carefully crafted fall by the wayside, like so many good dieting intentions.

Why?

Our trading (or dieting or exercise) plans are anchored to a particular state of mind—associated with a particular set of thoughts, feelings, and physical sensations. When something intervenes to shift us to another state, we lose our anchoring. We no longer have vivid and immediate access to the motivating experiences that spurred our initial intentions. The key is not to spend months and years psychoanalyzing why we are "self-defeating" or otherwise lack "self-esteem". *Rather, we need to become our own therapists and learn to remain anchored, even in the face of market and emotional forces that could disrupt our trading plans*. That is the purpose of exposure-based techniques.

Overcoming Problem Patterns Through Exposure

Let's take a classic example of how exposure can break seemingly intractable emotional patterns. Ellen is suffering from a condition known as panic disorder. Sudden, episodes of anxiety hit at seemingly random moments, greatly interfering with normal activities. These episodes are so scary that she is afraid she is losing control and might even die. As a result, Ellen develops a fear of her panic episodes—something known as "secondary anxiety". Sure enough, her fear of the panic attacks leads her to become increasingly anxious and actually triggers further attacks. By the time Ellen makes it to therapy, she has been caught in a continuous cycle of worry, anxiety, and panic.

If I were using exposure methods with Ellen, I would first teach her a skill, such as a deep-breathing, progressive muscle relaxation method. This involves learning how to slow oneself down by reducing the rate of respiration and deepening the breathing while eliminating physical tension by gradually tensing and relaxing muscle groups from one end of the body to the other (See Figure One at the end of the article).

Once Ellen has learned this method, the exposure can begin. I would ask her to take a few rapid and shallow breaths, simulating hyperventilation. This *exposes* Ellen to the some of the same physical sensations that she experiences during the early phases of her panic attacks. It also summons those panicky thoughts and feelings that have become deeply associated with the physical sensations of anxiety. When Ellen begins to re-experience a bit of her anxiety, I instruct her to perform the deep breathing and muscle relaxation. She continues with the relaxation work until the initial anxiety sensations are eliminated.

After Ellen learns to extinguish the anxiety that comes from a few rapid, shallow breaths and then from more prolonged hyperventilation, I then have her perform more intensive exposure exercises. I may have her spin around in the room, recreating the feeling of dizziness that comes with her panic attacks. Later, I might encourage her to provoke panicky sensations by entering situations (such as a crowded shopping mall) that are associated with anxiety. In each case, she would expose herself to the very problem pattern that she has been trying to avoid, *but would always limit the exposure and immediately follow it with the rehearsal of a coping skill.* With daily practice between sessions, severe problems such as panic disorder can be successfully treated within a matter of weeks.

What makes this technique work?

Most of our problem patterns are painful; no one likes feeling anxious or depressed. It is only human nature to want to avoid emotional pain. In avoiding our problems, however, we never learn the control necessary for their elimination. By gradually and progressively exposing ourselves to stressful circumstances—all the while practicing ways of coping and maintaining control—we build a sense of mastery. This is how people learn to overcome crippling phobias and debilitating traumas. *No amount of talk substitutes for the first hand experience of directly facing fears time and time again and staying in control*. Repeated success changes the self-image, and it alters our self-talk. Suddenly, we really begin to feel and believe, “I can do this!”

Applying Exposure Methods to Trading

If you are going to serve as your own therapist in the exposure-based mode, the cardinal rule is: *You always must activate a problem pattern in order to overcome it*. It isn’t enough to think about your problems or talk about them. You must actually experience your problem patterns in real time, gradually and progressively, and make conscious efforts to counteract those patterns. If your trading problem is triggered by increasing your size, you will need to gradually and steadily trade larger. If your impulsive trading pattern occurs during trendless, low volatility markets or in the opening minutes of trading, *that* is when you will need to work on yourself.

Fortunately, we can speed emotional change through a process known as ***imaginal exposure*** . Imaginal exposure can be thought of as the psychological equivalent of paper trading. Instead of starting out with real-time problem situations (known as ***in vivo exposure***), we can vividly imagine scenarios associated with our negative patterns—triggering some of the feelings of greed, fear, doubt, and regret—and mentally rehearse strategies for dealing with those scenarios. Imaginal exposure is not as powerful as facing problems in vivo (much as paper trading lacks the immediacy of actual trading), but it is a useful starting point in building the sense of success and mastery. Just as athletes have found mental rehearsal to aid Olympic performance, the mental tackling of trading challenges can prepare us for the real thing.

Let’s consider an example:

Lou is an active futures trader, with a little over a year of experience under his belt. He has made most of beginner's mistakes and has learned from them, carefully planning his trades, limiting his losses, and scaling in and out of positions with initial sizes that are adjusted for market volatility. He largely trades the ES and NQ eminis in a short-term breakout mode, attempting to catch 1-4 swings per day depending upon trend and volatility conditions. His entries are based on dual RSI oscillator readings, using short-term (intraday) and longer-term (swing) parameters. While he has been generally successful, he notices that he has performed relatively poorly on upside and downside trend days. He finds that he hesitates too long in entering the market and then is too quick to exit the trades once they are profitable. As a result, he takes small bites out of the moves that should be providing him with much of his profit.

An examination of problematic trend days reveals that these begin with a gap at the open in which price moves sharply up or down relative to the last trade of the previous day. This gap immediately triggers negative thinking on Lou's part, much of which reflects feelings about having missed the apparent high or low in the market. During this period of regret, he is not actively following price action or planning an entry. Instead, he finds himself hoping for a pullback so that he might have a better entry point (and a reprieve from his self-recriminations). Price, of course, does not accommodate to his desire and moves even further from the open, now registering an "overbought" or "oversold" signal on the short-term oscillator. Lou uses this as further justification to hold off on entering a position, allowing him to miss a good segment of the morning trend.

This problem seems unusually rookie-like for an experienced trader, so we examine Lou's overall trading performance. Sure enough, we find that his worst losses have occurred when opening gaps in the market have been reversed. These false breakouts have left him buying at the early highs and selling at the lows, starting his day with solid losses and shaking his confidence. This allows us to see that *what appears to be the problem—the failure to enter the market early during trend days—is actually a coping mechanism designed to minimize the possibility of losses*. Unfortunately, it also minimizes opportunities!

Our exposure therapy for Lou begins with skill teaching, as in the case of Ellen. We teach Lou a method for behavioral self-control that involves slow, rhythmic deep breathing and soothing imagery and encourage him to practice this until he becomes skilled at maintaining his composure. In addition, however, we also want Lou to learn some vital *trading* coping skills. He needs a set of rules for distinguishing potential trend days from those that may reverse and/or rules for quickly identifying reversals once they occur. For example, his own research and a little mentoring from experienced traders might teach him that gaps that occur on X-period breakout highs or lows in the NYSE TICK are more likely to show continuation than gaps that occur without such breakouts. Alternately, he may find that moves from opening gaps that remain intact by Y o'clock are more likely to continue through the day than those that partially fill.

Once Lou has identified his trading rules for the problem situation and learned a method for cultivating self-control, the exposure work is ready to begin. First we can start with imaginal exposure, encouraging Lou to enter his relaxed mode with slow, diaphragmatic breathing and eyes closed. In this mode, he vividly imagines an preopening news report that sends the market gapping lower, well outside its prior Globex range. He maintains the visualization of the scenario as he practices his slow breathing and mentally rehearses the appropriate trading strategies. Thus, for instance, he might image the TICK plunging to a multi-day low on the opening move and the SP failing to fill its gap on the first TICK bounce toward zero. This would be his trigger for a short entry, and he would clearly visualize each step he would take in monitoring the market, placing his order, setting his stops, etc. A similar set of visualizations could also facilitate the rehearsal of exit strategies.

Once all discomfort is extinguished in the mental rehearsals, the next step in exposure work would be applying the skills in paper trading. Using historical market data, we would have Lou advance charts bar by bar in trading simulations of trend days *while rehearsing his self-control and trading strategies*. Only when these simulations proceed successfully (i.e., eliminating anxiety) would Lou undertake real-time, in-vivo exposure, beginning with small positions and building to larger ones. (The speed with which Lou progresses from imaginal exposure to paper trading to in vivo work would depend upon the severity of the problems and the intensity with which he rehearses the techniques. Research suggests that fewer but longer, more intensive exposure sessions are more effective in eliminating negative emotional patterns than a greater number of brief exposures.)

The idea is that, before Lou confronts another potential trending day in the market again, he will have experienced multiple successes in handling such days in imagination and then on paper. It is the repeated experience of mastery and success that provides the power behind exposure-based intervention. Nothing so builds confidence as repeatedly facing and overcoming one's fears. (See Figure Two at the end of the article for keys to success in the exposure method).

A Final Note

There are many psychological approaches that can enable us to gain control of our problem patterns. Exposure-based methods are particularly useful for futures and options traders because they can be self-administered and often produce rapid results. Such methods cannot overcome all problem patterns; sometimes people with chronic difficulties need additional forms of treatment, including medication. Nevertheless, when emotional reactions are situational rather than chronic—and especially when you can isolate the trading situations that trigger the problem patterns—exposure-based techniques are excellent mechanisms for gaining control and staying anchored to trading plans.

Notice, however, that I have emphasized the need for proper, researched trading strategies to accompany the exposure methods. As an experienced clinical psychologist

and trader, I can assure you that self-help techniques alone will never enable you to master the markets. If you want to know how to trade a candidate trend day, an intraday range breakout, or an afternoon consolidation of a morning trend, you damned well better have researched those market conditions and generated some rules and techniques to guide your entries and exits. Otherwise, you will be teaching yourself to focus and relax while you lose your hard-earned capital.

What psychological methods can do is provide you with the self-control to implement your well-researched trading strategies. That is important. Consistency of effort, not the home run trades we all like to talk about, best positions us for trading success.

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Figure One
Relaxation Training: A Useful Behavioral Technique

Step One: Deep Breathing – Close your eyes and begin breathing deeply, slowly, and rhythmically. Your breathing should be from the diaphragm, and should not be forced or exaggerated in any way. During the deep breathing, you keep your body as still as possible, performing the exercise in a quiet, distraction-free environment.

Step Two: Mental Focus – Fix your attention on a peaceful, relaxing stimulus while you are performing the deep breathing. You can play instrumental music through headphones if this is helpful and/or focus your attention on soothing mental images or scenes. For instance, you could imagine yourself in vivid detail walking along an ocean beach, smelling the salt spray, feeling the warmth of the sun, hearing the crashing waves, etc. The key is to make the music and/or imagery all absorbing, tuning out internal chatter.

Step Three: Muscle Relaxation – Once you are feeling more relaxed, begin at one end of your body (such as your toes) and tense and relax one muscle group at a time, working your way to the other end of your body. Ten repetitions for each muscle group, with hearty tensing and slow, easy relaxing, works well. This can be performed while you are breathing slowly and deeply to the accompaniment of the music and/or imagery. From toes and instep to calves, knees, thighs, buttocks, back, shoulders, arms, wrists, fingers, neck, and forehead, you progressively undo your body's tension.

Step Four: Self-Awareness – When you have finished the muscle relaxation, slowly open your eyes and notice how you are feeling. By now you have been breathing deeply and slowly, with an altered focus and physical relaxation, for quite a few minutes. Very often there are particular physical sensations that accompany your relaxed, focused mode that traders call ***the zone***. I find that I experience a quiet feeling in my head, as if I am somewhat removed from the world. Such sensations can become your cue, alerting you that you have entered the zone and are ready to deprogram old patterns via exposure.

Note – At first it can take a while to get to the zone. With practice, you can become very good at the breathing and muscle relaxation and enter the zone in a matter of minutes or even seconds. The key is frequent rehearsal, first under normal conditions, then under conditions of gradually increasing stress.

Figure Two
Keys to Success With Exposure Methods

- ***Patience*** – Taking the time to become fully relaxed before starting the exposure is crucial. Give yourself enough time to reach the zone (see Figure One).

- ***Persistence*** – A key to extinguishing negative patterns is repetition. Applying coping skills to problem scenarios again and again, in imagery and in vivo makes stressful situations safe and familiar.

- ***Gradualism*** – Set yourself up for success by starting with manageable versions of your problem patterns and imaginal exposure before tackling your greatest challenges in vivo.

- ***Consistency*** – These are short-term techniques, but applying them intensively and consistently on a daily basis provides superior results.

- ***Realism*** – Exposure can break old problem patterns, but by itself won't instill new patterns of success. Nothing substitutes for experience and research in the markets!

Finding the Zone: New Perspectives on the Mental Game of Trading

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This is a draft of an article that has appeared in the December, 2002 issue of SFO Magazine. The actual article can be accessed by registering at the SFO site: www.sfomag.com

A number of recent books have emphasized trading as a performance activity, in which mental state is a key element in success or failure. So prevalent is this view that two separate books with the same title—*Trading in the Zone*—have appeared in the last two years. What is this "zone" and how can traders reach it with consistency? In this article, I will review ideas about the zone from a variety of sources, including new research in cognitive neuroscience, and spell out the implications for futures and options traders looking to improve their mindsets—and their profits.

Understanding the Zone

The idea of a performance-enhancing zone originated neither in athletics or trading, but in the philosophy of Zen Buddhism. In the 1930s, Eugen Herrigel traveled to Japan to learn Zen through the practice of archery. Nearly two decades later, his book, *Zen in the Art of Archery*, popularized the notion of achieving excellence through mental discipline. His book was the inspiration for the popular novel *Zen and the Art of Motorcycle Maintenance* written by Robert Pirsig. Interwoven in Pirsig's story of a father and son rediscovering each other on a motorcycle journey is a serious exploration of the experience of "quality". Traveling on a cycle, Pirsig explains, possesses a different

"quality" from driving a car. In the latter, you are always watching reality through a frame, shut inside a compartment. On a cycle, he writes, you are "*in* the scene, not just watching it anymore, and the sense of presence is overwhelming." This fusion of actor and act, performer and performance, is experienced as "the zone".

Crucial to the philosophy of Zen—and to the accounts of Herrigel and Pirsig—is the idea that our normal state of consciousness ruins the quality of the Zen experience. As soon as we consciously think about our performance, we are no longer one with it. Trying harder at a task only compounds this separation. The discipline of the Zen archer can be found in the performer's ability to still the mind, remove mental interference, and allow instinctively honed skills to manifest themselves naturally.

In their books *Trading in the Zone*, authors Mark Douglas and Ari Kiev emphasize the importance of focus and concentration in reaching a state where trading flows without seeming effort. Both authors view the zone as an outgrowth of trading discipline and a positive mindset. Once the trader lapses into patterns of fear, greed, and frustration, the zone is lost and instincts born of long hours of observing market patterns cannot emerge. For the trader, as for the Zen archer, turning off the mind is a crucial element in success.

But how valid is this notion of the zone? Do elite performers in archery, trading, and other fields of endeavor truly find their success in Pirsig's state of "quality"? This is where research provides surprising answers.

Creativity and the Zone

Abraham Maslow was one of the first psychologists to study healthy, high-functioning individuals rather than mentally ill ones. His investigation of "self-

actualizing" people—those who were unusually creative, productive, happy, and fulfilled—led to several important discoveries. Foremost among these, he found that self-actualizing people report a significantly greater number of "peak experiences" than the average individual. These peak experiences, he explained, have an almost mystical quality, in which the person feels suddenly at peace, at one with the universe. Invariably these experiences arrive during moments when the self-actualizing person is immersed in an activity of personal significance. Interestingly, they emerge naturally and spontaneously, not by conscious design.

Could Maslow's "peak experiences" refer to the same mind state noted by Herrigel in Zen archery, by Pirsig in his exploration of "quality", and by traders who have experienced "the zone"?

Research by University of Chicago psychologist Mihaly Csikszentmihalyi would answer in the affirmative. Studying unusually creative, successful individuals across a variety of disciplines, Csikszentmihalyi found that their work activity is accompanied by a state of "flow". This flow state is experienced as inherently enjoyable, in which workers are so immersed in their tasks that time seems to melt away. They lose awareness of themselves and their settings, becoming one with their labors.

In his book *Creativity: Flow and the Psychology of Discovery of Invention*, Csikszentmihalyi identified nine characteristics of work activities that yield the flow experience (See Figure One). He found that challenging tasks with clear goals and immediate feedback provide the greatest intrinsic pleasure. Summarizing these studies, Csikszentmihalyi writes, "Every person we interviewed said that it was equally true that they had worked every minute of their careers, and that they had never worked a day in

all their lives. They experienced even the most focused immersion in extremely difficult tasks as a lark, an exhilarating and playful adventure." He describes performers in the zone as "programmed for creativity" because their pleasure-pain mechanism leads them to seek ever-greater productive challenges. (See Figure One at the end of this article for a list of characteristics associated with "the zone").

What makes the creative, successful, self-actualizing person unique, then, is not just the presence of "peak experiences", "flow", or "the zone", but the ability to access and sustain this state with regularity. This is only possible, Csikszentmihalyi asserts, when people intrinsically love what they are doing. The trader who is primarily motivated by factors extrinsic to the markets themselves—by a need to prove himself, a desire to avoid failure, or urges for fame or fortune—is less likely to find the zone than the trader who finds the markets fascinating in their own right. From the Maslow-Csikszentmihalyi perspective, it is the trader who is "programmed for creativity"—who finds intrinsic enjoyment in the rigors of studying and trading market patterns—that is most likely to develop unique, winning trading strategies.

Exemplary Achievement and the Zone

Persistence of effort fueled by intrinsic love for one's work seems to be a formula for success across a variety of disciplines, not just trading. Studies supporting this conclusion date back to Francis Galton's 1869 work on *Hereditary Genius*. Investigating eminent creators, Galton found that these high-functioning individuals were capable of performing large amounts of highly laborious work, as if they were "urged by an inherent stimulus". This "laboring instinct", Galton believed, was a major factor in determining success or failure.

Subsequent research has confirmed Galton's early conclusions. Psychologist Dean Keith Simonton of the University of California at Davis, in his book *Greatness: Who Makes History and Why*, explains of highly productive creators, "These individuals are driven by huge motivational forces that far eclipse the impetus behind less accomplished colleagues…Geniuses cannot spend so many hours without an inherent passion for what they do". The reason the successful people are successful, Simonton found, is that they produce more than their colleagues: more works of art, more scientific experiments, more political initiatives. Because of this productivity, they are more likely than the average person to hit the jackpot and stumble across a truly meaningful contribution.

These findings have significant implications for traders of futures and options. A trader's productivity might be measured, not just by his or her equity curve, but in the number of unique and viable trading strategies that can be generated. The trader motivated by an intrinsic fascination with the markets is constantly working on the markets, seeking a tradable edge. A developer of 100 mechanical systems, on average, is more likely to come up with a robust trading method than a trader tinkering with the canned "systems" that accompany many charting software programs. Similarly, the discretionary trader who has observed and paper traded thousands of days of market action is more likely to internalize tradable patterns than the part-time trader. *The zone is important, not just because it blocks negative emotions from trading, but because it provides the motivational fuel for achieving market mastery*.

The hypothesis worthy of consideration, then, is that the factors underlying trading success are similar to those underlying success in other fields of endeavor. The

successful trader, like the scientific genius or great artist, attains a state in which effortful activity is experienced as inherently pleasurable. This state of flow—what traders know as the zone—blurs the distinction between work and play, fueling an extraordinary level of creative effort.

This hypothesis fits well with the research of K. Anders Ericsson, who has found that successful performers in sports, the arts, and sciences are distinguished by the amount of intensive, deliberative practice they devote to their disciplines. As Ericsson reports in his book *The Road to Excellence*, there appears to be a lawful, linear relationship between the amount of time spent in high-quality practice and the performer's ultimate level of achievement. Significantly, many of the characteristics of high quality practice, as observed by Ericsson, overlap the factors that generate the flow state, including challenge, clear goals, and rapid feedback. *It appears that exemplary performers structure their practice in such a way as to maximize flow/zone states, thereby sustaining their motivation for hard work.*

Ericsson observes that effort alone is not enough to generate the zone. Physical exertion by itself, for example, does not ensure a pleasurable experience. Rather, it is the specific effort of mental concentration that generates an altered state of consciousness and heightens learning and performance. When a musician is immersed in her craft, Ericsson notes, she can generate a flow experience. When that immersion is interrupted by coaching, the zone is lost. As Herrigel discovered in his investigation of Zen archery, it is not possible to be at one with an activity and simultaneously concerned with the activity's outcome. If traders are to find the zone, it can only be through the highly focused concentration that occurs during trading itself. *While positive thinking and*

trading discipline are necessary for reaching the zone, they are not sufficient. Sustained mental effort appears to be the key.

Cognitive Neuroscience and the Zone

What is happening in the brain when traders are in their zones? While studies have yet to be conducted measuring brain activity during actual trading, we do know quite a bit about the brain activity associated with sustained mental effort thanks to imaging studies and investigations of patients with localized brain injuries.

This research suggests that attention, concentration, and sustained mental effort are associated with a high level of activity in the brain's frontal lobes. In his book of the same title, neurologist Elkonon Goldberg refers to the frontal lobes as *The Executive Brain*. When people need to coordinate complex activities, such as generating and executing a trading plan, the frontal lobes receive a disproportionate share of cerebral blood flow. The frontal lobes, neurologist Oliver Sacks writes in the foreword to Goldberg's book, "are crucial for all higher-order purposeful behavior…The intentionality of the individual is invested in the frontal lobes".

When there is injury to the frontal lobes, the result is a decline in the ability to carry out purposeful behavior. Neurologists refer to this as the "dysexecutive syndrome", and it is typified by emotional interruptions of intentional activity, impulsivity, and distractability—qualities not unlike those seen in attention-deficit hyperactivity disorder (ADHD).

Figure Two summarizes characteristics of successful and unsuccessful traders derived from writings on trading psychology. These include my own recent investigations with Linda Raschke, in which we surveyed the traits of 64 active traders.

Notice how the parallels between the successful and unsuccessful traders mirror the differences between individuals who have intact versus impaired frontal lobes. Could it be that the conditions associated with frontal lobe activation—the intensive concentration and mental effort of the zone—are also the stuff of which good trading is made? (See Figure Two for a comparison of characteristics distinguishing successful and unsuccessful traders).

Research supports such a conclusion. Arthur Shimamura at the University of California at Berkeley summarizes a series of studies that identify the role of the prefrontal cortex as one of "dynamic filtering". The frontal lobes allow us to carry out intentional, complex tasks by filtering out extraneous stimuli. This permits us to keep plans firmly in working memory while we carry out the specific tasks associated with those plans. Among the stimuli that are filtered out by frontal activity are emotional experiences. Activation of the frontal lobes by remaining focused on planful, intentional trading—i.e., trading in the zone—turns out to be among the most effective strategies for eliminating emotional interference with decision-making.

Interestingly, the frontal lobes tend to be more involved in novel tasks than routine ones. When a skill is first learned, blood flow to the frontal lobes is at its greatest, and is centered in the right brain hemisphere. As the skill becomes automatic, the flow shifts to other brain regions, particularly in the left hemisphere. This makes sense, since the greatest attention and mental effort are needed to process new stimuli. Once a task is routine, such as driving a car, it no longer requires the participation of the brain's executive center.

Experienced futures and options traders know that patterns in the markets are never static. The patterns one finds in a low volatility, bracketing market are different from those observed in a trending, volatile environment. In his book *The Education of a Speculator*, well-known trader Victor Niederhoffer refers to this phenomenon as "ever-changing cycles". To the extent that market patterns shift over time, traders are confronted with ongoing novelty. *Trading can never become a wholly automatic task, as the identification of new patterns requires the effortful involvement of the brain's frontal lobes*. This conclusion suggests that the capacity to sustain mental effort is a necessary ingredient in ongoing trading success, allowing traders recognize and exploit ever-changing cycles before they melt away. It also helps explain the common understanding among traders that one must filter out emotions to be successful. To the extent that one is immersed in greed, fear, or frustration, the zone is lost and novel patterns cannot be identified and exploited. Temporarily, it is as if the trader functions with a dysexecutive syndrome or ADHD, reducing the capacity for intentional behavior.

This brings us to a second, important hypothesis: *The experience we call "the zone" is an altered state of consciousness that accompanies ongoing activation of the brain's frontal cortex. It facilitates accelerated learning by enabling us to sustain effortful, focused attention.* As I emphasize in *The Psychology of Trading*, the zone can be thought of as the "second wind" of consciousness. It is a by-product of sustained, high-quality effort that becomes a motivational state in its own right. Recognition of that fact opens the door to new and promising strategies for trading psychology.

Finding the Zone: Strategies for Traders

How can traders improve their ability to operate within the performance-enhancing zone? Several strategies can be derived from the research covered to this point:

1. ***Deliberative Practice*** – The trader can structure practice sessions in such a way as to mirror the conditions needed to produce flow experiences. This means that practice sessions should: have clear goals; be sufficiently challenging to require a high degree of mental effort; offer prompt and accurate feedback; and proceed with a minimum of distractions. Such practice sessions are not merely teaching exercises; they also serve as training in reaching and sustaining the zone. Simulated trading exercises using historical data are particularly helpful as tools for deliberative practice. By advancing data bar by bar, constructing trading plans, placing trades, managing and exiting positions, traders can rehearse essential trading skills in a challenging fashion, receiving immediate feedback about their efforts.
2. ***Progressive Resistance*** – The development of one's executive capacities—the hallmark of operating within the zone—is very similar to one's physical development. Just as weightlifters must challenge themselves with sufficient resistance to build muscle strength, progressively increasing the resistance over time, traders can improve their focus by tackling increasingly complex trading challenges. For example, deliberative practice involving simulated trading of a single market position could be followed by rehearsal requiring the management of multiple positions. Simulations could also be initiated under conditions of

increasing distraction to require greater mental efforts. (See the September, 2002 SFO article, "Trading the Ranger Way" for a model of training drawn from the military that incorporates the notion of progressive challenge).

3. ***Frequent Breaks from Trading and Deliberative Practice*** – One of the interesting findings from research with expert performers is that they rehearse their skills in bursts. Episodes of high-quality concentration lasting no more than a few hours are followed by frequent breaks, often in the form of brief naps. A number of successful traders note that they stop trading when they are tired and stop trading at points in the day when volatility diminishes. This gives them time to recover their concentration and stay in the zone when they are trading. In a recent interview with Mark Etzkorn, for example, well-known trader Mark Cook reported that he finishes most of his trading by 2:00 ET. "At that point," he explains, "I've already been thinking 'market' for seven hours, and that's about my limit." His self-study revealed that his performance diminishes when he trades beyond his fatigue threshold: when he is presumably out of the zone.
4. ***Biofeedback*** – Of all the strategies for developing trading expertise, this may have the greatest potential. Biofeedback systems that measure skin conductance, heart rate, muscle tension, and brain waves are becoming increasingly affordable, allowing individuals to monitor their own levels of calm and arousal. While a calm biofeedback profile does not guarantee that one is in the zone, an aroused profile almost certainly ensures that the wrong brain regions are being activated for optimal performance. By combining biofeedback with deliberative practice, traders can track when their emotional patterns are taking them out of the flow

state and threatening to disrupt their trading. In my own research, I have been working with forehead skin temperature biofeedback, which is highly sensitive to enhanced blood flow to the brain's frontal cortex. By tracking rises and declines in forehead temperature during practice sessions, traders can objectively measure the degree to which they are in the zone and discover strategies that maintain the state.

5. ***Cognitive Exercises*** – Elkonon Goldberg raises the intriguing notion of creating gymnasiums for the mind, in which cognitive exercises raise the level of frontal lobe functioning. Such exercises are already utilized with success among patients who have experienced brain injury or dysfunction. Goldberg believes that normal individuals can similarly enhance their brain functioning by exercising their frontal lobes with tasks that require sustained concentration across progressively challenging tasks. For example, in my own research, I measure forehead skin temperature while performing mental sums on the stock prices moving by on the ticker tape. Because the tape moves relatively quickly, the task requires intense concentration. Interestingly, forehead skin temperature tends to stay highly elevated throughout the task (suggesting frontal lobe activation), resulting in a state of quiet focus akin to the zone. Through these and other exercises, such as those found in Zen, it may be possible to create flow experiences on demand, placing traders more consistently in a high performance zone.

Conclusion

Robert Pirsig, in his *Zen and the Art of Motorcycle Maintenance*, offers the interesting observation that the real motorcycle the rider works on is the cycle called the

self. Whether it is cycling, Zen archery, or trading, working on one's craft and working on oneself are one and the same. Through disciplined and intensive training, we literally shape the brain and create the motivational states necessary to sustain exemplary performance. This article suggests that traders can greatly accelerate this process. "What I do every day is a mental exercise that increases my mental dexterity…" trader Mark Cook observes. "I always say, 'I am not a trader, I am trading'. Trading has engulfed my being." The real market we are trading, he has found, is the market called the self.

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Figure One

Characteristics of Work Experiences Associated With “The Zone”

1. There are clear goals every step of the way;
2. There is immediate feedback to one’s actions;
3. There is a balance between challenge and skills;
4. Action and awareness are merged;
5. Distractions are excluded from consciousness;
6. There is no worry of failure;
7. Self-consciousness disappears;
8. The sense of time becomes distorted;
9. The activity becomes autotelic (pleasurable in its own right).

Adapted from Csikszentmihalyi, 1996

Figure Two

Characteristics of Successful and Unsuccessful Traders

Successful Trader	***Unsuccessful Trader***
Trades with a plan	Trades impulsively
Trades in a rule-governed fashion	Trades on hunches and urges
Trades when in a clear mental state	Trades emotionally
Trades when focused on the markets	Trades when focused on the self
Becomes problem-focused after a loss	Becomes emotion-focused after a loss
Trades with tested strategies for trade management	Trades with little or no risk management
Trades selectively, based on risk/reward	Trades inconsistently; overtrades and undertrades

Finding Solutions: How Traders Can Become Their Own Therapists

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In recent years, brief therapies have demonstrated their effectiveness for dealing with a number of normal life challenges. Unlike traditional psychotherapies, which may take months or even years to show results, these short-term techniques often help people change persistent problem patterns in as few as several sessions. Even more interestingly, these therapies can be learned by the motivated layperson, allowing individuals to become their own therapists. This is particularly useful for traders of futures and options, for whom time is the essence.

In the October, 2002 issue of SFO Magazine, I presented a brief, intensive method for overcoming anxiety and impulsive behavior patterns known as exposure-based therapy. In this article, we will turn the tables and explore a set of methods used to cultivate *positive* trading behaviors. Known as solution-focused therapy, it is one of the briefest and most powerful of the "therapies for the mentally well".

How Problems Are Constructed

A cornerstone of the solution-focused method is the idea that problems are constructed by the human mind: they represent ways in which we view ourselves. An example might help illustrate this somewhat unusual idea:

John is a trader of S&P e-mini futures contracts. He has had several losing days in a row and on two occasions failed to honor his stops, wiping out several weeks of profit. The night before his last busted trade his sleep had been fitful, and he attributed his lapse in discipline that next day to fatigue. The next evening he vowed to get good sleep, but found himself mulling over the day's poor trading. As a result, he could not fall asleep and woke up even more fatigued than the previous morning. Fortified by coffee, he vowed not to make the same errors, but now found himself hesitant in taking his normal trades. Cursing his "sleep problem", he decided he would take an over-the-counter sleeping aid and go to bed early that night. When he still found himself replaying the day's missed opportunities in his head, however, he started to worry that he would never recover his sleep. Frantically, the next day he called his doctor and asked for help with his insomnia.

The problem, from a solution-focused vantage point, is not simply that John cannot sleep. Rather, he has drawn a conclusion in his mind that he is an insomniac; that he has a sleep problem. This construction of a problem-based identity helps to maintain many negative patterns of thinking, feeling, and acting. Once people label themselves as "bad traders", "insomniacs", or "depressed", they tend to react more to the label than to their initial difficulties. John begins with a normal sleep disruption that, sadly, contributes to a lapse in his trading discipline. Instead, however, of viewing his problem

as one of trading—leaving his stops too discretionary, so that fatigue affects their implementation—he defines the problem as one of sleep. Once he constructs this sleep problem, it now becomes an object of worry and threat. Even normal difficulty getting to sleep becomes viewed as evidence of "my insomnia", further convincing him that he has a problem that will undermine his trading.

Solution-focused therapists emphasize that many life difficulties possess this self-reinforcing quality. A statistically normal, but nonetheless upsetting string of negative events is viewed as a new problem, which sets off an emotional chain reaction of anxiety and depression, and further reinforcement of "the problem". Active traders of futures and options are very familiar with this phenomenon when they experience streaks of wins or losses. Even random trading results are apt to show runs of consecutive wins or losses, yet traders—like gamblers—become convinced that they have a hot hand or a cold one. Once they construct the notion of being hot or cold, they alter their trading accordingly, perhaps by raising or lowering their position size or by taking trades they normally would not. This shifts them from their time- and experience-tested strategies, raising the likelihood that their equity curves will suffer.

Another way in which constructed problems become self-reinforcing is the notion of "trends". A short-term futures trader takes a long position in the SP after a seeming price breakout and then observes the market move one, two, three bars in the opposite direction. At some point, the trader concludes that the countermovement is evidence of a new, downward trend—despite the fact that the market is moving in a range not distinguishable from random motion. Now emotionally reacting to this constructed

"trend change", the trader bails out of his long position, only to see the market spike higher after its consolidation of the prior breakout.

The important idea offered by the solution-focused therapists is that many problems that bring people for help do not exist in reality. They are byproducts of the mind's ceaseless search for meaning in events. Even random occurrences can be taken as meaningful, leading us to believe that problems are present when nothing meaningful has actually changed. As we shall see, this tendency of the mind to construct problems out of randomness creates pitfalls for therapists and traders alike.

Why Self-Help Techniques Often Don't Work

Traders of futures and options typically work with a high degree of leverage and recognize the need to always be on top of their game. They are all too aware of the ways in which emotional interference can create lapses in discipline and distortions in perception, resulting in trading losses. As a result, many traders are interested in psychology and self-help methods that can assist them in maintaining their focus.

To be sure, there are many such self-help methods that can be useful additions to the trader's toolkit. Indeed, I recently wrote a book ("The Psychology of Trading"; Wiley, January, 2003) that details many of these methods, and I employ them religiously in my own trading (see www.greatspeculations.com/Brett.htm for specific applications). From a solution-focused vantage point, however, traditional self-help methods often make trading difficulties worse, not better. Let's explore why.

Returning to our trader John, who is bemoaning his insomnia and its impact on his trading, let us imagine that a psychologist recommends a relaxation exercise before he gets to sleep as a way of winding down and becoming sufficiently drowsy to fall asleep.

Perhaps a psychiatrist might also prescribe a short-term course of a sleeping aid to help John return to his sleep cycle. Although these are sensible courses of action, many times they will backfire. John will return to his counselor or physician with continued sleep difficulty and an even greater sense that he has an intractable problem.

The reason for this backfire is subtle, but important. By offering aid for John's sleep, the helpers are unwittingly buying into his initial premise that he *does* have a problem. The more they talk about his "sleep problem", the more they reinforce the notion that this is, indeed, a real problem that exists independent of John's meaning-making mind. This is especially problematic in longer-term therapies, where exhaustive discussions of the person's past conflicts helps cement the idea that the person is, indeed, conflicted and troubled. After all, why would your therapist treat you for a problem unless you really had a problem?

Let's bring the issue a bit closer to trading. Suppose a trading coach offers assistance for their client's "cold streaks". The coach may advice about unique money management strategies, protective stops, trading methods, or self-help techniques to cope with these streaks. All of this assistance, however, simply reinforces the underlying idea that these streaks exist, that they are a problem, and that trading needs to be adjusted to deal with them. Like the trader who exits a long position too early following a couple of adverse bars, the trader who experiences several consecutive losses is all too likely to abandon a worthwhile system at the worst possible time. From a solution-focused vantage point, any help that you seek for a problem is apt to reinforce that problem in your mind, making it worse. Many problems begin in random ways, but—ironically—

are maintained by the very things we do to eradicate them. (See Table One at the end of this article).

So what is a trader, therapist, or trading coach to do? The example of streak trading offers perhaps the clearest illustration of an alternate strategy. Instead of addressing the "cold streaks", the coach could aid the trader in backtesting his trading methods. This would identify expectable runs of losses based upon real market data. Armed with a concrete set of expectations regarding normal drawdowns, flat equity periods, and consecutive losers, the trader would be inoculated against the tendency to overinterpret events. Random adverse outcomes would be less apt to be taken for more than what they are.

Finding the Solutions: An Alternate Strategy

Solution-focused therapy avoids the pitfalls noted above by redefining the aims of the helping process. When traders seek psychological advice, they typically frame their request as, "Can you help me get rid of X?", where X is a problem pattern in trading. Their aim is to eradicate a conflict, habit, or mood state, which they have interpreted as *their problem*. Solution-focused work does not seek to eliminate such negatives. Rather, it identifies people's goals—the positives they wish to attain—*and the ways in which they are already achieving these*, even in limited fashion. The idea is not to do less of problem X, but to do more of solution Y.

Once again, an example will prove helpful. A couple comes to counseling indicating that they have "communication problems" and are considering a legal separation. They indicate that they are arguing frequently and that they seem to have grown apart. The wife indicates that her husband spends too much time working on his

trading, ignoring family responsibilities. The husband says that his wife continually nags him to do things around the home, leading him to retreat to his study. During the session, the wife bursts out in frustration, "You never listen to me!" The husband, in turn, replies, "You never support my work!"

Clearly the couple has constructed the notion that they are on the ropes. The idea of "never"—that he never pays attention to her or that she never supports him—reinforces the idea that this is a dysfunctional relationship. If the other party *never* behaves in a manner that is conducive to a good marriage, little wonder that separation seems to be the only option.

The solution-focused counselor will not fall into the trap of exploring the couple's conflicts. Discussing their problems—especially airing them in the meeting—will only further convince the couple that things are hopeless, that they cannot avoid being swamped by their difficulties even in the therapist's office. Instead, the solution-focused counselor asks each member of the couple to describe *exceptions* to their problems. "I'm sure you don't argue 24 hours a day, 7 days a week," the counselor might point out. "Tell me what you're doing when you're not arguing." Or, even better, the counselor could point out that there might be times when the couple feels just a little bit closer to each other than during the fighting times. "What are you doing differently during these closer times?" might be the question.

Beneath the counselor's inquiries is a key assumption: *During the exceptions to presenting problem patterns, the couple is doing something different and is doing something right.* Very, very few people are wholly dysfunctional. The key is to identify what they are doing when they are more functional—and then to construct this as a

solution. Instead of doing less of the problem, the idea is to keep doing more of the behaviors that bring them toward their goals.

The couple, for instance, may report that they feel closer when they act as a team, citing an occasion when they had to cooperate to get the house ready for a family reunion. From that recognition might come homework exercises that involve a high degree of teamwork toward shared goals, such as jointly planning a vacation or researching investments. In the process of performing these exercises, the couple finds out that they can, indeed, enjoy each other's company, undermining the construction that they have a "bad relationship" and "never" care for each other. Indeed, the new experiences allow them to construct a more positive identity for themselves, creating a solution out of the exceptions to the initial problem.

When traders become mired in problems, the solution-focused approach is to search for the exceptions. "Let's take a look at what you're doing when you're trading well," is what I said to a troubled trader who complained of a fear of "pulling the trigger" on trades. "Instead of assuming that you 'never' trade well, let's look at your successful trades and find the kernel of an effective trader. Let's find out what that kernel is all about and then develop it. The goal is not to eliminate a trading problem, but to become more of the trader you have always been when you're at your best."

With trader John's insomnia problem, for example, the solution-focused counselor might ask, "What kind of trading are you doing when you sleep well?" Out of this is likely to emerge a set of healthy trading practices that, once reinforced and extended, will allow John to sleep naturally, of his own accord. *The key to the solution-*

focused method is to identify what people are doing that brings them closer to their goals—and then have them do more of it.

Applying the Solution Focus to Trading

In my personal trading, I have made an annual ritual out of conducting an audit of the trades made during the past year, focusing on the winners as well as the losers. From the audit of the winners, I try to identify what I did right: what was working for me during the past year. These become the basis for "trading solutions" that I consciously attempt to implement in the coming year (See Table Two at the end of this article for a sample list of trading solutions from my personal trading). The idea is to create my own model of trading success, but to build the model from my own experience rather than borrow it from a trading guru. Before each trading day, I rehearse elements of this model in my trading diary, which I maintain as an online weblog (www.brettsteenbarger.com/weblog.htm). This consistent rehearsal helps me to internalize the trading solutions so that they become an automatic part of the trading arsenal.

The solution-focused method appears to work for much the same reason that evolution works. When there are random mutations within a gene pool, some of these prove highly adaptive and improve a species' survival rate. Over time, this selective pressure increases the representation of the mutation within the gene pool, until it becomes dominant. Similarly, we can view our trades as a set of mutations within the total pool of our trading behaviors. By emphasizing the successful trades and paying particular attention to these—constructing them as solutions—we exercise our own selective pressure and increase the representation of those behaviors in our repertoires.

Conversely, when we are problem focused—paying more attention to our deficient behaviors than our successful ones—we unwittingly reinforce these and create a kind of devolution.

Recently, I extended the trading audit concept to daily preparation by identifying a single "trade of the day" for each past day's trading. The trade of the day, which is part of the daily weblog, is not necessarily the most profitable trade one could have made, but it is the highest probability successful trade either that I did make—or should have made—given my trading systems and data. For instance, if the market emerges from an oversold condition and rises on a breakout number of stocks making short term new highs and a breakout level of positive TICK, the odds of continuation of the upside move are favorable. Entering on the long side of such a breakout, perhaps on the first pullback in the Dow TICK, might constitute my trade of the day. By identifying "best trading practices" each day, I cement in my mind the way I want to be trading, reinforcing solutions rather than spinning my wheels over problems.

To be sure, solution focused methods are not the answer to all trading challenges. Sometimes people do experience emotional disorders that interfere with their success, and these can require ongoing attention and treatment. Auditing worst trades can also be useful, especially in eliminating those few trades that often create a large share of one's annual losses. Among helping approaches, however, solution-focused work is unique in its ability to help traders become their own therapists. By requiring market participants to find their own successes and create models built on these, the solution focus makes each person his or her own guru, empowering traders rather than fostering an unhealthy dependence on others.

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Table One

Trading Problems: A Solution-Focused Perspective

1. Many problems begin as a string of negative events or as a single, powerful negative event that capture the trader's attention.
2. While a string of negative events or single, powerful negative events can occur through chance alone, people tend to search for meaning in events and look for explanations and patterns.
3. Once traders notice a problem, focus on it, and create explanations for it, they alter their behavior in an attempt to eradicate it.
4. Attempts to analyze and eliminate problems generally reinforce these problems and their consequences, creating a vicious cycle.
5. Over time, a problem focus becomes internalized, leading traders to experience themselves negatively, undercutting confidence.
6. By the time most traders seek help for trading problems, they have already internalized a problem-based identity, which further interferes with the information processing needed for successful trading.

Table Two

Sample Trading Solutions: Patterns From an Audit of Successful Trades

- Keeping each trade small, removing the pressure associated with any particular trade
- Keeping trade size constant, with each trade like every other, making trading automatic
- Limiting trades to one or two intraday swings on the SP or ND, entering markets only when tested patterns show a significant directional bias
- Limiting breakout trades to those in which the breakout is qualified by a breakout level in the NYSE TICK and/or a breakout in the number of stocks making intraday new highs or new lows
- Exiting overbought or oversold markets when the five minute volume in the ES or NQ contract spikes higher by three or more standard deviations, compared with the normal volume for that five minute period (blowoff moves)
- Entering trades only when price and the cumulative normalized TICK and TIKI lines have already moved in the direction of the anticipated move, using the most recent lows/highs in these values as a stop-loss for long/short trades.

How Experts Make Decisions Under Uncertainty – Part I

Brett N. Steenbarger, Ph.D.

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A recent research study reported in the New York Times (January 20, 2004; *Subconsciously, Athletes May Play Like Statisticians* by David Leonhardt;) offered intriguing insights into how athletes are able to make complex decisions in a split-second fashion. www.nytimes.com/2004/01/20/health/20TENN.html

Consider a couple of examples that I have assembled:

- A major league baseball batter faces a pitch thrown at over 80 miles per hour. The pitch is headed directly for the batter's head. If it is a curve ball, the pitch may break down and away for a strike. In that case, the batter will want to stand his ground and take a swing. If it is a straight fastball, the pitch may strike the batter and end his career. In a couple of moments, the batter must assess numerous variables to determine whether to stay in the batter's box and swing or duck and protect himself. The speed and rotation of the ball, the movement of the pitcher's hand, knowledge of the pitcher's repertoire—all to into an equation that is solved faster than it can be verbalized.

- Col. John Boyd studied the behavior of "top gun" fighter pilots of military aircraft and found that, during dogfights with enemy planes, they make sophisticated decisions in a matter of seconds. He described the decision-making process of Observe, Orient, Decide, and Act (OODA), and became convinced that the key to training was to accelerate the OODA loops so that pilots could respond more quickly and accurately than the enemy. A top pilot himself, Boyd was famous for his challenge that he could start from a position of disadvantage in the air and get behind the tail of any pilot who challenged him within 13 seconds—a challenge he apparently never lost.

What makes these examples worthy of consideration is that the expert performer is facing a high degree of uncertainty. There is no way of predicting in advance whether a pitcher will throw one pitch or another, and there is no way of anticipating one's next adversary in the air. Once the situation arises, there is also no opportunity for calm, rational, explicit reasoning through the situation. The subconscious mind must assess the relevant variables and make the optimum decision before any explicit reasoning occurs.

How is this possible?

Here's a snippet from the New York Times article that describes the recent research:

Each participant in the experiment sat down and placed a hand on a tabletop. A projection of a computer screen blocked their view of the hand. The goal was to guide a cursor, which followed the movement of the hand, from one side of the screen to a target on the other side.

Adding to the uncertainty, the cursor usually appeared slightly to the right of the hand, and the participants caught at most a quick glimpse of it when it was halfway across the screen. Sometimes, the cursor appeared as a discrete point; other times, it was an ill-defined cloud.

The researchers found that when no cursor flashed, people relied on what they had learned during 1,000 practice runs before the experiment: namely that the cursor was, on average, one centimeter to the right of the hand. When a cloud flashed, they considered it, but only somewhat, in a pattern that followed what Bayes's formula predicted. When a distinct cursor flashed, they relied on it and not past experience.

"Most decisions in our lives are done in the presence of uncertainty," Dr. Körding said. "In all these cases, the prior knowledge we have can be very helpful. If the brain works in the Bayesian way, it would optimally use the prior knowledge."

There are several important pieces of information from the research:

- To make their decisions, subjects needed a prolonged learning period. It took 1000 practice runs to enable subjects to make accurate predictions of the location of the cursor. This is consistent with the "implicit learning" research, which has found that subjects who are exposed to complex patterns for thousands of trials eventually learn those patterns and can make predictions based on those patterns at levels far better than would be expected by chance. Amazingly, however, they cannot verbalize those patterns or how they are making their decisions. Their learning is truly implicit—processed entirely by the subconscious mind.

- When subjects encountered new, uncertain information that contradicted the patterns they had learned for 1000 trials (the cloud), they weighted the new information in a complex manner that was consistent with Bayesian mathematics. Stated in practical terms, the subjects gave increasing weight to the new information over time, revising their estimates of the cursor's location in a way that integrated the new, uncertain information with what they had learned previously. This also is consistent with the implicit learning research literature. People can process information in complex, mathematical ways, even when they are not familiar with complex mathematics!

- When subjects encountered new, certain information that contradicted the patterns they had learned for 1000 trials, they abandoned their previous learning and went entirely with the new data. That is, they were able to put aside their prior expectations and quickly create a new basis for decision-making. This is not as easy as it may seem. People have a natural "confirmation bias" that leads us to seek out information that supports our expectations and ignore data that contradict what we believe. Here's a link to an academic article on the subject of confirmation bias: www.peel.pitt.edu/esa2003/papers/wolfe_confirmationbias.pdf . What is particularly interesting in this article is that the authors find that the confirmation bias prevents people from making decisions in a Bayesian fashion. That is, people do not accurately integrate new, uncertain information with old experience—the way experts do—when they stay anchored to their old expectations. This makes them too slow to react to new data. Experts are thus not only able to make lightning, subconscious decisions; they can also quickly revise those decisions as new data arrive. Fast and flexible are hallmarks of expertise.

There are very important implications for short-term trading in this research. One key conclusion is that the distinction between intuitive, discretionary trading and research-based, quantitative trading may be smaller than we think. Here is the outstanding finding of the research:

Our subconscious mind is a quant!

When expert traders have been exposed to thousands of examples of intraday price and indicator patterns, their subconscious minds are able to extract patterns from the noise in a manner that they themselves cannot verbalize. This is implicit learning. As new information from the market arrives second by second, the subconscious mind integrates it with the old knowledge in a complex, Bayesian fashion. One or two pieces of discrepant information—one or a few ticks against one's swing position, for example—will not necessarily trigger a decision to abandon the trade. As the discrepant information accumulates, however, it changes the expert trader's estimates of the likelihood that the trade will succeed. The trade starts to feel wrong before the trader can put his finger on what's not right. That gut impression comes from an important place—and is not just a subjective intuition. It is the result of a rigorous (subconscious) mathematical analysis!

When new information arrives to the expert trader that obviously contradicts his or her expectations (such as a sudden market reaction to a piece of economic news), the prior learning goes out the window. The expert trader is quick to exit the trade and revise expectations, rather than wallow in a confirmation bias that now fights the tape.

What keeps traders from becoming expert performers? How can we become good Bayesians? If Colonel Boyd can train a top gun to analyze an enemy fighter pilot's actions and outmaneuver than enemy in 13 seconds, perhaps we can learn to accurately respond to short-term market patterns. That is the topic of Part II of this article.

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How Experts Make Decisions Under Uncertainty – Part II

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In Part One of this two part series, I pointed out research that suggests that the subconscious processing of athletic performers displays a Bayesian quality, weighting recent events against past ones to respond to shifting patterns of circumstances. When a market shifts volatility, for example, the expert trader must integrate the new data with his or her large database of experience to anticipate the next tick or the next directional move. How much weight to give the new experience, and how much to alter that weighting with each fresh experience, is the task of the Bayesian. It appears that the subconscious mind is capable of performing sophisticated integrations of new and old data to anticipate future events. This allows for peak performance under fast, stressful conditions that do not permit conscious, explicit processing, such as those faced by fighter pilots, professional boxers, and scalpers.

Can this subconscious basis for expertise be cultivated? In an earlier article drawn from the training of elite Army Rangers, I looked at one possible model for facilitating superior performance. Perhaps we can also learn from the training of elite athletes and develop models for improving the performance of traders.

Research in Sports Psychology

What do we know about the psychological factors that contribute to success among athletes? A comprehensive research review reveals several important ingredients of superior performance:

- *Goal-Setting* – Over 500 studies find that setting goals facilitates performance across a variety of short-term tasks and long-term objectives. Goals that are highly specific, achievable but challenging, and performance rather than outcome-focused tend to be most effective. There is also evidence that blending short- and long-term goals, as well as group and individual goals, can enhance effectiveness in achievement-oriented settings.

- *Practice* – A wide range of studies of athletes, as well as experts in other fields, finds that cumulative practice is closely related to the development of expertise. This is especially the case where there is implicit learning—situations requiring the acquisition of performance skills that cannot be verbalized (such as learning to hit a tennis ball). Large numbers of practice trials with immediate feedback are particularly helpful to skill development.

- *Arousal* – Research suggests that moderate degrees of stress aid performance, while high distress can produce catastrophic declines in performance. Recent findings indicate that it is how anxiety is processed—how each person views their own stress—that is more important to performance than the absolute degree of physiological arousal.

- *Self-Efficacy* – The athlete's beliefs about his or her own capacity to perform is significantly related to actual performance. The belief in one's own capacity to succeed is the single most important personality factor associated with athletic success. Studies find that interventions that improve self-efficacy tend to improve athletic performance, even when they involve mental practice (imagery) rather than actual athletic performance.

- *Coaching* – Recent research finds that the self-efficacy beliefs of coaches are significantly and positively correlated with improvements in the performance of their athletes. Differences in coaching style also meaningfully affect athletic performance, primarily by influencing the motivation of the athlete.

How are these different findings related to the research on subconscious learning?

A plausible explanation is that goal-oriented intensive practice with rapid feedback not only builds skills, but also increases the self-efficacy of athletes. This allows the elite athlete to use arousal to facilitate rather than interfere with performance, as stress is viewed non-threateningly. The role of the coach is less to teach skills—since the skills are implicit—than to create the conditions under

which skill acquisition can be maximized. These include motivational conditions, but also conditions related to the effectiveness of practice sessions.

It is worth noting that much of this elite training takes place in team environments, including sports teams, military units, and business settings. The team setting assists with motivation by creating a supportive environment for demanding training, but also allows participants to learn from each other through observation and peer coaching. Friendly competition between teams also serves as a preparation for actual competition, honing skills under realistic performance conditions.

Summary

The success with which a trader can learn to read ever-changing market patterns may be related to the quality and extent of training he or she undertakes. Every major study of implicit learning finds that it takes thousands of concentrated learning trials before an individual develops mastery of a task. Most traders fail, I would suggest, because they never develop the critical mass of intensive learning trials needed for subconscious expertise. Without a team environment to model skills, motivate skill development, and provide goal-oriented coaching, the majority of individual traders may never develop the self-efficacy needed to weather inevitable periods of loss and flat performance. This is particularly problematic for the part-time trader, who may lack the intensive practice needed for mastery simply as a function of the reduced amount of time available to internalize market patterns, rehearse execution skills, and utilize feedback.

While much market writing focuses on the development of new indicators or methods for analyzing market data, it may well be the case that the most promising avenues for improving trading performance are tools and technologies that supercharge learning and accelerate the learning curve.

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How to Take a Loss

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There are quite a few books written on how to make money in the market. Some of them are even written by people who have made money as traders! What you don't see often, however, are books or articles written on how to lose money. "Cut your losers and let your winners run" is commonsensical advice, but how do you determine when a position is a loser? Interestingly, most traders I have seen don't formulate an answer to this question when they put on a position. They focus on the entry, but then don't have a clear sense of exit—especially if that exit is going to put them into the red.

One of the real culprits, I have to believe, is in the difficulty traders have in separating the reality of a losing trade from the psychological sense of **feeling** like a loser. At some level, many traders equate losing with being a loser. This frustrates them, depresses them, makes them anxious—in short, it interferes with their future decision-making, because their P & L is a blank check written against their self-esteem. Once a trader is self-focused and not market focused, distortions in decision-making are inevitable.

A particularly valuable section of the classic book *Reminiscences of a Stock Operator* describes Livermore's approach to buying stock. He would sell a quantity and see how the stock responded. Then he would do that again and again, testing the underlying demand for the issue. When his sales could not push the market down, then he would move aggressively to the buy side and make his money.

What I loved about this methodology is that Livermore's losses were part of a grander plan. He wasn't just losing money; he was paying for information. If my maximum position size is ten contracts in the ES and I buy the highs of a range with a one-lot, expecting a breakout, I am testing the waters. While I am not potentially moving the market in the way that Livermore might have, I still have begun a test of my breakout hypothesis. I then watch carefully. How are the other averages behaving at the top ends of their range? How is the market absorbing the activity of sellers? Like any good scientist, I am gathering data to determine whether or not my hypothesis is supported.

Suppose the breakout does not materialize and the initial move above the range falls back into the range on some increased selling pressure. I take the loss on my one-lot, but then what happens from there?

The unsuccessful trader will respond with frustration: "Why do I always get caught buying the highs? I can't believe "they" ran the market against me! This market is impossible to trade." Because of that frustration—and the associated self-focus—the unsuccessful trader does not take any information away from that trade.

In the Livermore mode, however, the successful trader will see the losing one-lot as part of a greater plan. Had the market broken nicely to the upside, he would have scaled into the long trade and likely made money. If the one-lot was a loser, he paid for the information that this is, at the very least, a range-bound market, and he might try to find a spot to reverse and go short in order to capitalize on a return to the bottom end of that range.

Look at it this way: If you put on a high probability trade and the trade fails to make you money, you have just paid for an important piece of information: The market is not behaving as it normally, historically does. If a robust piece of economic news that normally sends the dollar screaming higher fails to budge the currency and thwarts your purchase, you have just acquired a useful bit of information: There is an underlying lack of demand for dollars. That information might hold far more profit potential than the money lost in the initial trade.

I recently received a copy of an article from *Futures Magazine* on the retired trader Everett Klipp, who was dubbed the "Babe Ruth of the CBOT". Klipp distinguished himself not only by his fifty-year track record of trading success on the floor, but also by his mentorship of over 100 traders. Speaking of his system of short-term trading, Klipp observed, "You have to love to lose money and hate to make money to be successful…It's against human nature what I teach and practice. You have to overcome your humanness."

Klipp's system was quick to take profits (hence the idea of hating to make money), but even quicker to take losses (loving to lose money). Instead of viewing losses as a threat, Klipp treated them as an essential part of trading. Taking a small loss reinforces a trader's sense of discipline and control, he believed. Losses are not failures.

So here's a question I propose to all those who enter a high-probability trade: "What will tell me that my trade is wrong, and how could I use that information to subsequently profit?" If you're trading well, there are no losing trades: only trades that make money and trades that give you the information to make money later.

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Identifying Breakout Moves

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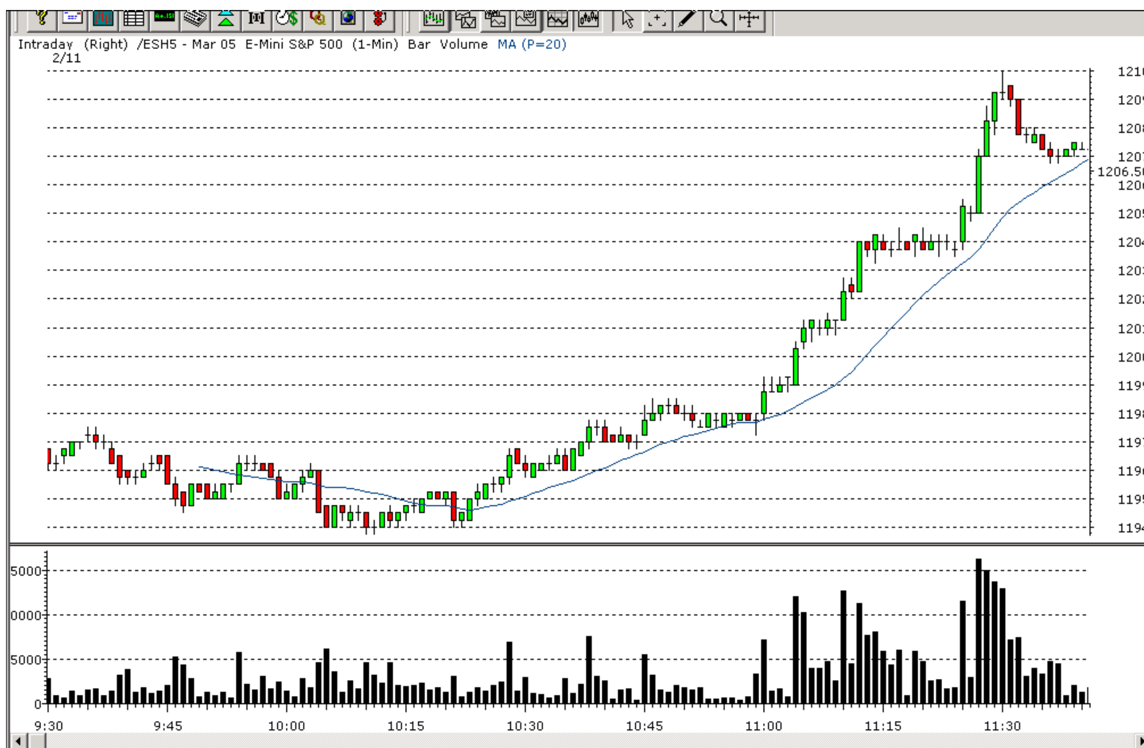
Academic studies suggest that the price changes in markets form a leptokurtic distribution—not the normal distribution that we remember from our days in statistics classes. A leptokurtic distribution is one with a very tall peak at the (zero) center, quickly descending slopes on either side of center, and then fatter tails than would be found in the normal curve. Stated simply, a leptokurtic distribution means that there are many price changes around the zero area (mean reversion), but also more than normally expectable far from the mean. To the trader, this translates into markets that spend a large percentage of their time in a range bound mode, but then can trend unusually far and persistently in a single direction.

This simple market reality sets up two distinct trading styles: one for a range bound market that fades moves away from the mean, with the expectation of mean reversion, and the other for breakouts from the range that will tend to trend in the persistent manner. These truly are different trading modes, as one will have you selling highs and buying lows; the other will have you buying (breakouts from) highs and selling (breakouts from) lows.

Breakout moves commonly take place from areas that large numbers of traders are regarding as "support" and "resistance". Frequently these are price levels that have held as highs or lows over multiple time frames (morning and afternoon; consecutive days; etc.). When these levels are finally pierced, fresh volume enters the market to take advantage of the breakout, propelling the market beyond its "level". Valid breakout moves will not let traders get back in at the prior support/resistance point and, indeed, won't even let traders work orders to get into the market. The trader who doesn't want to "pay up" by entering at the market finds himself left behind.

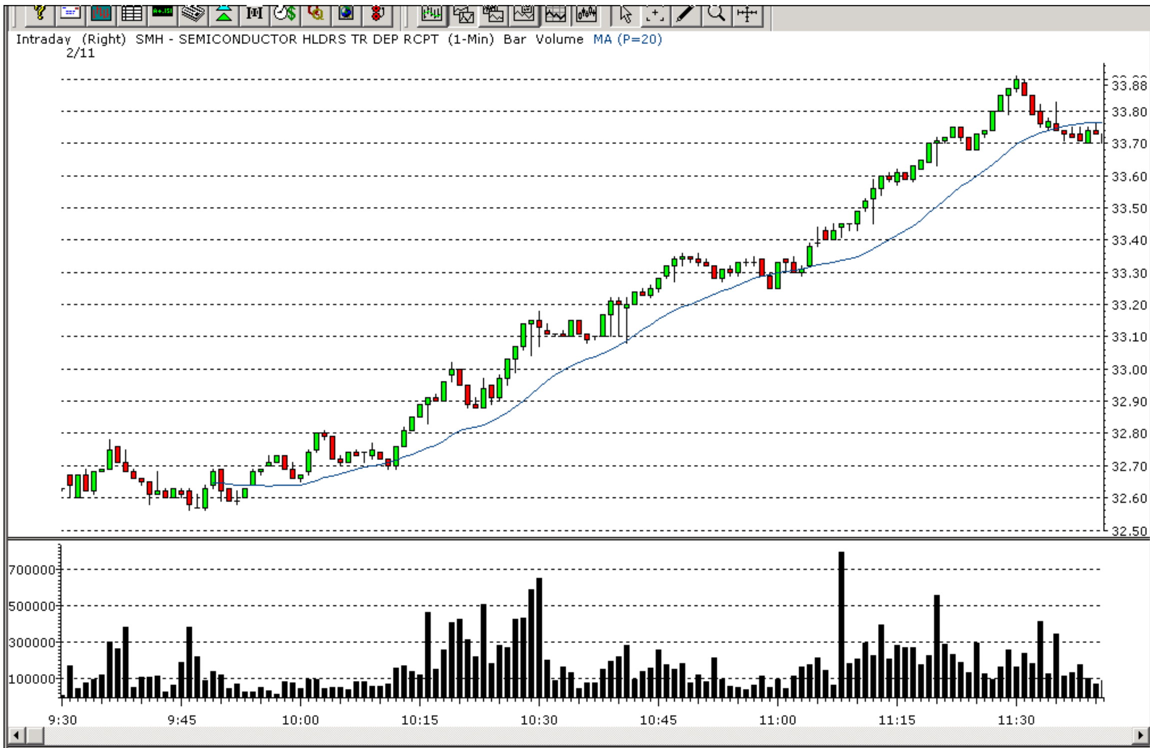
The S&P futures chart below, taken from Friday, February 11th, 2005, neatly shows the anatomy of a breakout move. The 1199.50 level had held as a high two days prior in the afternoon and then again the prior day. Once it was pierced on greatly expanded volume at 11:04 ET, it was off to the races as new buyers established value at much higher levels.

Once that breakout occurred, the only winning strategy was to get on board as quickly as possible. The general rule for breakout trading is that the duration of the prior range is proportional to the extent of the following breakout move. A range that extends for multiple days will not yield a breakout that exhausts after several one-minute bars. One can buy highs in such a market with reasonable assurance that the move has further to go.

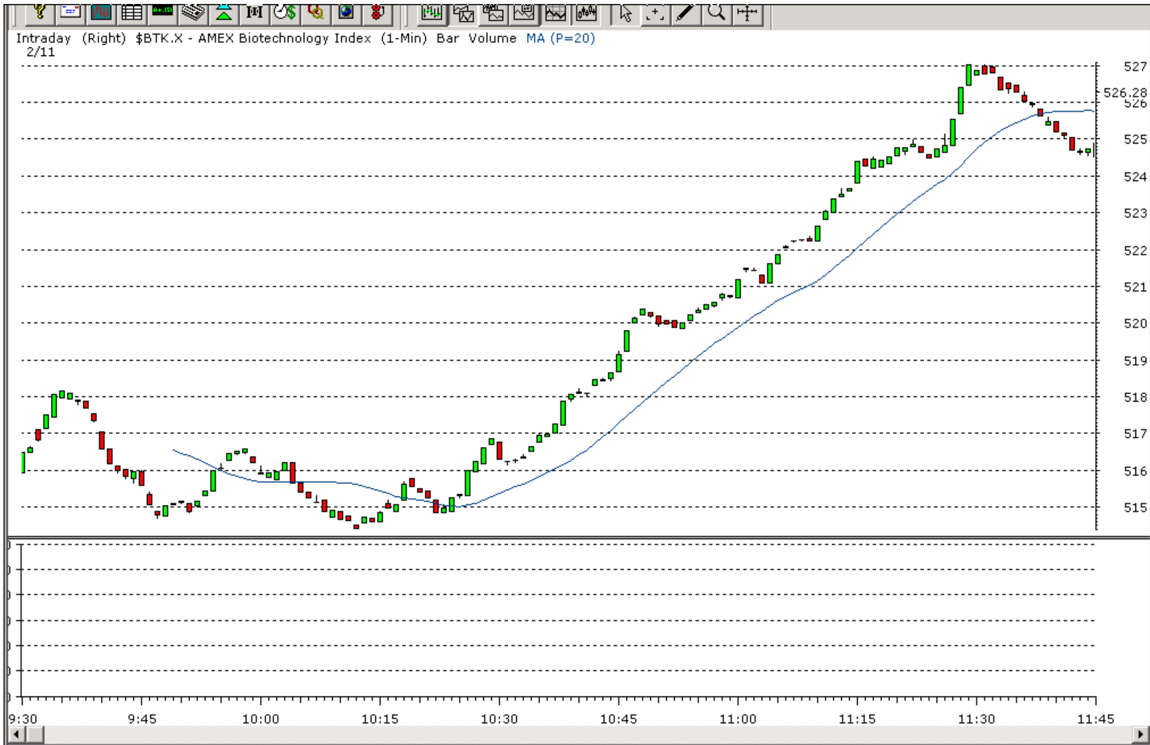


It was my daughter Devon who, several years ago, came up with the idea that stocks behave like schools of fish. When a small group of leaders changes direction, the entire school is sure to follow. The key to anticipating market breakouts—rather than getting on board once they've begun—is finding the leaders of the school. They will make their breakout moves well in advance of the broad market.

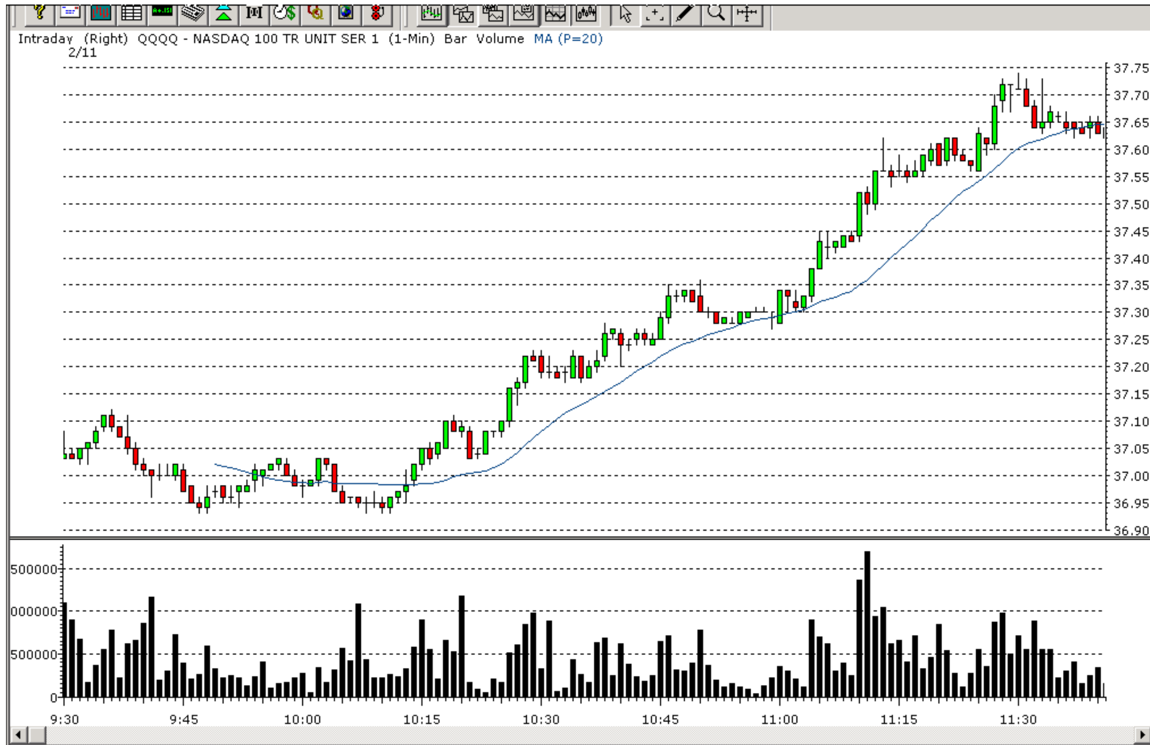
Below we can see that the semiconductor stocks made their breakout move—a thrust to new highs on expanded volume—roughly 45 minutes before the S&P 500 made its move. By the 11:04 ET breakout in the ES, the semiconductors were already well into their trending mode.



Were the semis the only lead fish? Below is the cash index for the biotechnology stocks.



Below is the broad NASDAQ 100:



The prices of the index you are trading form your **text**; what happens within the larger school of fish forms the **context**. Recognizing breakout moves—and maybe even anticipating them—requires an attention to context. Tunnel vision is the trader's enemy.

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Information Processing and Trading

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Here is an interesting observation drawn from the past six months of working with a large group of full-time traders: The most successful of the group **never** change the displays on their screens. Each morning the same information appears in the same place. The less successful traders, on the other hand, tend to experiment. They will look at different indicators each week, different ways of displaying the data, etc.

Now it may just be that successful traders are sticking to what has been working and less successful ones are casting about for solutions. I think, however, that it goes beyond that. New traders who become successful start out more consistent with their screen displays than struggling new traders.

From an information processing and learning vantage point, this makes sense. How do traders develop a feel for the market? During the research for my book, I came across a large—and underappreciated—body of research documenting the phenomenon of "implicit learning". Subjects in studies, exposed to complex patterns in number sequences, eventually learn to predict the next number in the sequences at levels far greater than chance. This typically occurs only after thousands of trials and immediate feedback regarding success/failure. Interestingly, even after they have developed this predictive ability, they cannot explain how they are able to anticipate the next in the sequence. They have learned the pattern, but cannot explain it: their learning is implicit.

My sense is that successful traders develop a feel for the market the same way that the subjects of these studies develop a feel for the patterns that they are exposed to. This would explain several things:

1) The best traders can make money, but can't necessarily explain how they do it.

2) The best traders generally start out by losing money, but develop their skills over an extended period of experience.

3) When markets change—in trend or volatility—the best traders generally need to go through another learning curve.

4) The best traders lose their edge when they are taken away from the settings in which their learning has occurred, as in the case of successful pit traders who cannot succeed in electronic trading, or successful S&P traders falling down when trading currencies or bonds.

5) The best traders get more exposure to the markets than their less successful peers by spending more time following markets—even after hours by reviewing tapes and charts.

This sheds a different light on the observation regarding the data displays of successful and unsuccessful traders. When traders change their displays, they basically restart their implicit learning process. If thousands of repetitive trials are necessary to internalize complex patterns, changing displays prevents such internalization. Adding charts to a display or toggling among multiple displays does not necessarily inform the trader. Immersion in smaller amounts of relevant information may be far more contributory to success.

A second implication of the above line of reasoning is that traders may fail, not because they are unable to learn market patterns, but because the patterns are not being captured in a user-friendly manner.

Let's take an example from schooling: A student in an elementary mathematics class might not pick up the idea of division by reading about it. When the process is explained out loud, however, or when it is demonstrated on the blackboard, the student immediately catches on. The problem is not that the student is stupid; rather it's that the student assimilates auditory and visual modes of presentation more easily than the written word. Time and again during my student counseling days at a medical school, I witnessed academically struggling students suddenly come to life when they joined study groups. The act of talking the material aloud and processing the information (inter)actively transformed mere learning by rote reading and highlighting of notes.

When you look at the information that is processed by the trader, you see that at least 90% of it is visual—most often pictoral, in the form of charts. The idea of using other senses to process market information—olfactory, kinesthetic, gustatory, even auditory—is quite foreign. It is not at all clear, however, that all people (or all traders) are visual learners. Might it be that traders fail, not because they're unable to learn market patterns, but because the traditional ways of presenting these patterns are not user-friendly? Suppose data were presented in an auditory format, with trading volume represented by auditory volume and price represented by pitch? Or if traders read their information from a numerical table rather than a chart? Or if traders processed information in groups rather than individually?

It is common to hear traders assert that it takes months or years to "learn the market"? Might that be more a reflection of the poverty of our displays than any existential reality? Putting different information onto our screens might be akin to shuffling deck chairs on the Titanic. If success has been elusive, perhaps it is time to "see" in a different way.

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Discipline

Educational

Tyler Bollhorn, Stockscores.com

What does it take to be a good trader? Many would say it is an excellent understanding of the stock market, or perhaps a lot of good contacts. Having access to technology and the ability to get trades in quickly are important. But above all else, the one thing that is more important to successful trading is something that seems very simple.

Discipline.

Sounds simple, yet it is the greatest failing of people who lose in the stock market. Successful traders realize that they will not be right all the time. Many successful traders are profitable on less than half their trades. Given these losing probabilities, the reason winners make money is because they cut losses short and let profits run. They have the discipline to hit the eject button when they are proven wrong. And those who consistently lose money? They hang on for the dream

Fear of taking a loss or fear of missing out on an uptrend cause many market participants to hang on to losing positions. So often, these traders tell themselves that they will sell when the stock falls to a certain point. However, when it does, they find a reason to establish a new limit. Too much attention is paid to the story and not enough attention is paid to the message that the market is telling.

When you take a position in a stock, you have to establish the point that the market will prove you wrong. Whether you choose to base that point on support and resistance levels, or the announcement of news, this point represents a bad outcome of your trading decision. If triggered, the exit sign is flashing. Head for the door.

Failure to take a loss when proven wrong will have two effects. First, it will likely make a potentially small loss grow into a big one. Remember that successful traders take small losses. A big loss takes often has a longer holding period, so it also ties up capital. And it will take more profits to recover.

Second, it will create fear for the trader who is seeing profit and does not want to feel the pain of a loss again. To avoid the potential disappointment of another loss, some traders take profits too early simply to lock in the good feeling that comes with making a win. Unfortunately, to be a successful trader you have to limit losses and let profits run. If you have small profits and big losses, well, you lose.

Maintaining discipline when trading is essential for success. If you have it, only simple rules of trading are necessary for success. Be strong, it is easier said than done.

Last Exit for the Lost

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I'm encountering frequent tales of the demise of once-successful "daytraders" of the futures markets, which perhaps had me thinking of The Fields of the Nephilim when I titled this piece.

Here is what I believe:

As an increasing number of players swarm to a recognized trading "edge", this creates new patterns of over-reaction and under-reaction in the markets and fresh sources of "edge".

The new sources of "edge" are always diametrically opposed to the old ones. Where the edge had been momentum plays with growth stocks, the new edge can be found in fading low volatility markets. The erstwhile edge in harvesting ticks from inefficient markets yields way to an advantage trading the more protracted overreactions of these short-term players.

The insight I had on Friday was that the patterns defining the current edge are not resolvable into the terms of the previous advantage. They are emergent phenomena, to draw upon a concept from systems theory. No amount of counting and categorizing pixels on a television set can yield insight into the meaning of a broadcast; the laws that capture the firing of neurons cannot speak to the content of resulting thought. The overreactions of today's traders form a larger pattern that becomes tomorrow's source of alpha. *The larger pattern cannot be seen from within the perspective of current traders*.

Yesterday's heroes always hope to hold on to their dying edge by blending the old with the new—oblivious to the fact that the new derives its edge precisely from the excesses of the old. Shades of Kuhn and paradigm shifts…

As I write this, Carl McCoy is growling "Love Under Will": a song about goodbyes at the graveside. I visualize the book in the eminis—the thick size and the frantic pulling and hitting of bids and offers—and I can see yesterday's traders desperately hoping to catch the next few ticks. Like the Nephilim contemplating life in the cracks and hollows, I'm resigned to the reality that "someone's gonna suffer."

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Training Traders for Success
Transcript of Chatroom Class for Linda Raschke's Traders
July 08,2002

lindarasc: 16:20:45 Brett is working with the people in MIT in sharing different thoughts and putting together questionnaires,
lindarasc: 16:21:06 and today he is going to talk about subject that uses his paper that we posted for you as a departing point!
lindarasc: 16:21:07 So...
lindarasc: 16:21:17 Welcome back Brett!
brett: Hello, and thanks for having me back.
brett: I think I'll start by introducing the topic for the day...
brett: Then by getting into the main ideas...
brett: And perhaps we'll have some time for questions/comments that can be sent to a moderator...
brett: And forwarded to me.
brett: In this class session, I'd like to focus on issues of training for expertise...
brett: So I won't be talking about the current market or ways of analyzing the market...
brett: Anyone interested in that can go to my weblog which is linked at www.greatspeculations.com
brett: Today the focus is on how people develop expertise and become proficient at what they do.
brett: I have been looking at sports, games of skill, the military, music, etc...
brett: To try and identify what makes people truly great at what they do...
brett: With the idea that we might be able to abstract some of these principles and ideas to the training of traders.
brett: As we'll see, this will nicely take us to the theme of the article: OODA.
brett: An excellent book on the topic has been written by K. Anders Ericsson...
brett: He has studied experts in various fields and studied how they became experts...
brett: Here's an interesting quote from his research:
brett: "The acquisition of expert-level performance in a domain is very difficult and takes many years...
brett: with only gradual improvement even under the best circumstances. The key problem for a beginner is to...
brett: identify a sequence of training tasks with attainable learning goals that will eventually lead...
brett: to the desired level of performance. Thus the complex and ill-defined goal of acquiring expert performance...
brett: is broken down into a sequence of attainable training tasks."
brett: In fact, what Ericsson is referring to can be seen clearly in military training, and is very relevant...
brett: for the development of traders.
brett: Before troops are sent into simulated battle or actual combat, they engage in a lengthy period of drilling...
brett: Where they have to repeat certain skill activities again, and again, and again.

brett: They receive prompt and accurate feedback on a timely basis and use this in a feedback loop to improve performance.
brett: The same is true in sports, where there is drilling of individual skills such as dribbling, rebounding, etc...
brett: in basketball or work on various putting, driving, etc skills in golf.
brett: Expertise, Ericsson would argue, is built from the ground up, and requires a functional breakdown...
brett: of the activity into doable skill-chunks with much practice and repetition.
brett: This is one reason I am particularly interested and excited about the research project Linda is conducting.
brett: What she is doing is highlighting a limited number of trading skills and then drilling traders on these...
brett: day after day in real time trading. The format of the chatroom very much fits with what we know...
brett: about how expertise is developed.
brett: Notice that Ericsson emphasizes the *gradual* nature of skill development...
brett: In his studies, expertise is a function of *years* of deliberative practice on a regular basis...
brett: With frequent drilling, rehearsal, etc.
brett: The best way to become a full time trader is to trade full time, because that is where the exposure is...
brett: but the learning curve can be *greatly* accelerated if you have a mentor who can break trading down into...
brett: component skills and assist with the drilling.
brett: BUT...
brett: more goes into expertise than drilling. In my review of research, I have identified several (5) factors:
brett: 1) Natural Talent - there is little doubt that certain basic skills are present in some individuals...
brett: more than others. You don't need a super high IQ to be a successful trader, but neither can you have...
brett: a truly deficient intelligence. Similarly, there are personality traits--which have a strong inborn,
brett: genetic component, that facilitate successful trading. Cognitive abilities are inborn as well, to a large...
brett: degree, and we know that the capacity for attention/concentration is a major factor in learning skills.
brett: So right away, in trading as in sports, some people start off with an advantage. Everything else determines...
brett: what you make of the advantages you've got. And that is important.
brett: 2) The second factor important in expertise is an early, strong interest in the activity, aided by mentorship...
brett: and encouragement.
brett: Experts aren't just interested in what they do...they seem to have a passion for it. It's in their blood.

brett: This draws them early to the activity and sustains them through the otherwise boring periods of practice...
brett: and the inevitable discouragements early in the learning curve...
brett: Mentorship becomes key in chanelling the talent and giving encouragement and guidance...
brett: It is *very* difficult to find wholly self-made peak performers. Coaches and mentors generally play a ...
brett: crucial role in the development of talent.
brett: 3) The third factor is the sheer quantity of practice. Those who become expert in their domains practice...
brett: *a lot*. Indeed, practice is their major activity. Olympic athletes are a great example...
brett: Their training is every day, with tremendous dedication.
brett: The sheer amount of practice has been found to differentiate people who are good in their fields and those...
brett: who are truly great. Their learning curves are so much more advanced as a function of greater exposure.
brett: 4) HOWEVER - The quality of practice is as important as the quantity. Specifically, valuable practice...
brett: is highly directed and deliberate.
brett: It is dedicated to learning specific abilities, applying the abilities to real life situations, and learning...
brett: from the results.
brett: The example given by Ericsson is the child who practices the piano simply because the parents demand it.
brett: The quality of practice is missing...
brett: Studies of chess players who become expert find that they spend much time studying the games of experts...
brett: They systematically compare the moves they would have made to the ones made by the experts and learn from...
brett: the discrepancy.
brett: Quality practice generally involves working with high quality teachers against high quality opposition.
brett: 5) A fifth factor in developing expertise appears to be a multimodal processing of information...
brett: There are many different learning styles, and most people have strengths and weaknesses as learners.
brett: An acronym that is useful in remembering learning styles is VARK.
brett: V = Visual
brett: A = Auditory
brett: R = Read/write
brett: K = Kinesthetic
brett: An auditory learner might pick up a lot from a lecture; a kinesthetic learner learns by doing, etc.
brett: I have a short VARK questionnaire that I can give the group some time if there is interest.

brett: But the key with respect to developing expertise is that information and skills are more deeply processed...
brett: When they are processed in multiple ways.
brett: So if we hear it, see it, read it, and do it, the skill and info is more likely to be internalized than if...
brett: we rely on one modality exclusively.
brett: This has interesting applications for training traders...multimedia is really the way to go!
brett: This is why mentors, such as in martial arts, have students listen, observe others, perform exercises, etc
brett: The combination of all the above makes for more effective and efficient learning.
brett: Finally, I have a 5
brett: sorry...I have a 6th factor I'll toss out.
brett: I call it "training in extremity" or TIE
brett: Successful training and development of expertise commonly involves performing skills under highly...
brett: challenging and even adverse conditions.
brett: This is *very* true of military training, where soldiers have to practice in difficult terrain, under hard...
brett: demands from squad leaders, etc. It is also true in coaching within sports, as coaches create extraordinary demands...
brett: during practice sessions to prepare for the rigors during games.
brett: Even chess players will push themselves to play blindfolded or in lightning fashion with very quick time...
brett: limits per move.
brett: By creating practice conditions that are more challenging than the normal scenarios likely to be faced...
brett: The expert performer builds mental toughness and develops the inner confidence that he/she can handle anything.
brett: This latter point is very very important.
brett: Training is NOT just about skill building...
brett: It is about developing one's identity within a profession/field of activity and developing the mind set...
brett: necessary for success.
brett: Quantity of practice that is high quality under strenuous conditions is a recipe for training success...
brett: Mentally as well as in the development of skills.
brett: Which brings us to OODA and the article.
brett: Imagine a time line of trading.
brett: At one end of the time line is a trader who places a maximum of one trade per week.
brett: He has plenty of time to analyze the markets, conduct statistical studies, consult charts, etc
brett: Now imagine the other end of the trading time line...
brett: The floor trader is scalping for ticks. He will place hundreds of trades in a day. He does not have the time...

brett: to conduct lengthy investigations, analyses, etc.
brett: THE SHORTER THE TIME FRAME OF TRADING--AND THEREFORE THE MORE RAPID THE TRADING--THE MORE NECESSARY IT IS...
brett: THAT THE SKILLS INVOLVED IN TRADING BE MADE AUTOMATIC.
brett: This is a fundamental law, I believe.
brett: As Colonel John Boyd identified, the winner in any aerial dogfight is going to be the pilot who is speediest...
brett: in mental processing. The quick loops of observe-orient-decide-act allow the pilot to maneuver before the opponent...
brett: can find his bearings.
brett: Speed of processing and executing skills is every bit as important as acquiring those skills in the first place.
brett: In other words, expertise consists of taking what starts out as effortful and making it automatic...more and more...
brett: efficient.
brett: So it is not enough to repetitively practice a skill...One must do so with ever greater speed and accuracy.
brett: One way this is done in the military is by creating those conditions of extremity.
brett: The "Best Ranger" competition is conducted each year by the Army...teams of Rangers (2 man teams)...
brett: are pushed to the extreme over 60 hours of nonstop task performance...
brett: including a 20-25 mile run with a 65 pound rucksack, timed assembly of a disassembled weapon, obstacle courses...
brett: and so forth. The emphasis is on speed...
brett: The teams don't move on to challenge number two until everyone has finished number one.
brett: That means that the speedy teams get time to rest. Otherwise, there is no rest.
brett: Once you can perform under such conditions...
brett: even the rigors of war become manageable.
brett: Because you now perform the activities in your sleep...they come automatically...even in the most difficult conditions.
brett: I believe that we can learn much from the training of Rangers and the greats in sports, chess, etc.
brett: Much of what we do as traders involves too little repetition, too poor quality of practice, and practice...
brett: THAT IS MUCH TOO COMFORTABLE.
brett: If we are going to speed up our OODA loops and become automatic as traders...
brett: creating structured exercises under conditions of adversity is a promising avenue.
brett: So allow me to conclude by telling you of my personal project.
brett: I maintain a large historical database of index prices, indicators (such as NYSE TICK), and other market statistics.
brett: I have carved the database into 5 day chunks, obscuring the dates and using altered index values.
brett: The percentage changes from minute to minute, etc are the same, but now the index has dummy values and I don't know...
brett: the date from which the data were drawn.

brett: I then pop up five day block after five day block and advance the screen one bar at a time for day six...
brett: And time myself in pulling the trigger on practice trades.
brett: And when I've traded the first chunk, the next chunk pops up, and I time myself again...and again...
brett: The whole idea is to purposely put myself in totally unfamiliar terrain (just like Special Ops training)...
brett: and quickly observe, orient, decide, and act.
brett: My score is based on my accuracy and speed.
brett: Once I perform reasonably well, I then add conditions of adversity to the training...
brett: I must perform over longer time periods, under conditions of distraction, with real money on the line, etc
brett: I believe there is much we can do for ourselves to speed up and steepen our learning curves...
brett: And at the same time cultivate the mental toughness and confidence needed to size up any market, pull the trigger,
brett: and make a few dollars.
brett: I am happy to discuss this and related topics with anyone who wants to email me.
brett: My address is steenbab@aol.com.
brett: I'd like to thank you for having me, and hopefully I've stimulated a bit of thinking...
lindarasc: 17:14:08 Hi Brett!
brett: about how you are training yourself for greatness.
lindarasc: 17:14:19 We were discussing using a randowm number generator....
brett: I look forward to staying in touch!
lindarasc: 17:14:25 to create random charts for you!
lindarasc: 17:14:27 for us!
lindarasc: 17:14:38 that would be interesting too!
brett: A lot of markets look random to me!! :-)
brett: Yes, that's a great idea.
lindarasc: 17:14:53 But that was an excellent presentation you gave us...
brett: Thanks
lindarasc: 17:15:05 and you are getting me motivated on a late Monday afternoon....!
lindarasc: 17:15:12 So, let me just stop and mention to everyone..
brett: Great!!
lindarasc: 17:15:19 if they have specific questions (I got none)
brett: Let's run an obstacle course!!
lindarasc: 17:15:33 They should go ahead and send them to your e-mail address....
lindarasc: 17:15:40 We will clean up a copy of this transcript,
brett: That's great...I'll get back to everyone who emails me.
lindarasc: 17:15:51 (which is easy since Brett's spelling is perfect)
lindarasc: 17:16:02 and we will have it posted for everyone tomorrow!
brett: Spelling is easier than trading!
lindarasc: 17:16:26 :-)....well, I am not so coordinated on the keyboard so neither are easy for me.
lindarasc: 17:16:37 But, Thank-you once again, and
brett: The key is eliminating thinking...

lindarasc: 17:16:47 if you have results from our one project trade today,
brett: Not positive thinking
lindarasc: 17:16:55 hold off on e-mailing them to us...
lindarasc: 17:17:01 wait till tomorrow after the close...
lindarasc: 17:17:07 We have the grid updated through Sunday....
lindarasc: 17:17:28 but we will update again after the close tomrorow so everyone can see the general results.
brett: I do encourage everyone to participate in the research...
lindarasc: 17:17:46 Point is just to have more PLUSSES in the column than mINUSES!
brett: I'll make sure you learn a lot from it...
brett: With lots of feedback of results, analyses, etc.
lindarasc: 17:18:16 OK....and if you are not signed up yet but wish to, we will give you instructions on how to do that tomrrow morning!
lindarasc: 17:18:26 Thank-you again BRETT!!!!
brett: Thanks, and have a good nite!!
lindarasc: 17:18:41 Good Night!
genghis: 17:18:39 Good Night

Learning to Trade: The Psychology of Expertise

Brett N. Steenbarger, Ph.D.

When people hear that I am an active trader and a professional psychologist, they naturally want to hear about techniques for mastering emotions in trading. That is an important topic to be sure, and later in this article I will even have a few things to say about it. But there is much more to psychology and trading than "trading psychology", and that is the ground I hope to cover here. Specifically, I would like to address a surprisingly neglected issue: How does one gain expertise as a trader?

It turns out that there are two broad answers to this question, focusing upon quantitative and qualitative insights into the markets. We can dub these ***research expertise*** and ***pattern-recognition expertise***, respectively. These perspectives are much more than academic, theoretical issues. How we view knowledge and learning in the markets will shape the strategies we employ and—quite likely—the results we will obtain. In this article, I will summarize these two positions and then offer a third, unique perspective that draws upon recent research in the psychology of learning. I believe this third perspective, based on ***implicit learning***, has important, practical implications for our development as traders.

Developing Expertise Through Research

The research answer to our question says that we gain trading expertise by performing superior research. We collect a database of market behavior and then we research variables (or combinations of variables) that are significantly associated with future price trends. This is the way of ***mechanical trading systems***, as in the trading strategies developed with TradeStation and the systems featured on the FuturesTruth.com site. We become expert, the mechanical system trader would argue, by building a better mousetrap—finding the system with the lowest drawdown, least risk, greatest profit, etc.

A variation of the research answer can be seen in traders who rely on ***data-mining strategies***. The data-miner questions whether there can be a single system appropriate for all markets or appropriate for all time frames. To use a phrase popularized by Victor Niederhoffer, the market embodies "ever-changing cycles". The combination of predictors that worked in the bull market of 2000 may be disastrous a year later. The data-miner, therefore, engages in continuous research: modeling and remodeling the markets to capture the changing cycles. Tools for data mining can be found at kdnuggets.com.

There are hybrid strategies of research, in which an array of prefabricated mechanical systems are defined and then applied, data-mining style, to individual stocks to see which ones have predictive value ***at present***. This is the approach of "scanning" software, such as Nirvana Systems' OmniTrader. By scanning a universe of stocks and indices across an array of systems, it is possible to determine which systems are working best for which instruments.

As most traders are aware, the risk of research-based strategies is that of overfitting. If you define enough parameters and time periods, eventually you'll find a combination that predicts the past very well—by complete chance. It is not at all unusual to find an optimized research strategy that performs poorly going forward. Reputable researchers develop and test their systems on independent data sets, so as to demonstrate the reliability of their findings.

Can quantitative, research-based strategies capture market expertise? I believe the answer is an unequivocal "Yes!" A perusal of the most successful hedge funds reveals a predominance of "quant shops". Several research-based stock selection strategies, such as Jon Markman's seasonal patterns (MoneyCentral.com) and the Value Line system, exhibit long-term track records that defy mere chance occurrence.

And yet it is also true that many successful traders neither rely upon mechanical systems nor data-mining. Indeed, one of Jack Schwager's most interesting findings in his Market Wizards interviews was that the expert traders employed a wide range of strategies. Some were highly quantitative; others relied solely upon discretionary judgment. Several of the most famous market participants—Warren Buffet and Peter Lynch, for example—employed research in their work, but ultimately based their decisions upon their judgment: their personal synthesis of this research. Quantitative strategies *can* capture market expertise, but it would appear that all market expertise cannot be reduced to numbers.

Developing Expertise Through Pattern Recognition

The second major answer to the question of trading expertise is that of pattern recognition. The markets display patterns that repeat over time, across various time-scales. Traders gain expertise by acquiring information about these patterns and then learning to recognize the patterns for themselves. An analogy would be a medical student learning to diagnose a disease, such as pneumonia. Each disease is defined by a discrete set of signs and symptoms. By running appropriate tests and making proper observations of the patient, the medical student can gather the information needed to recognize pneumonia. Becoming an expert doctor requires seeing many patients and gaining practice in putting the pieces of information together rapidly and accurately.

The clearest example of gaining trading expertise through pattern recognition is the large literature on ***technical analysis***. Most technical analysis books are like the books carried by medical students. They attempt to group market "signs" and "symptoms" into identifiable patterns that help the trader "diagnose" the market. Some of the patterns may be chart patterns; others may be based upon the identification of cycles, configurations of oscillators, etc. Like the doctor, the technical analyst cultivates expertise by seeing many markets and learning to identify the patterns in real time.

Note how the pattern recognition answer to the question of expertise leads to a very different approach to the training of traders. In the research perspective, traders learn to

improve their trading by conducting better research. This means learning to use more sophisticated tools, gather more data, uncover better predictors, etc. From a pattern recognition vantage point, however, trading success will not come from doing more research. Rather, direct instruction from experts and massed practice leads to the development of competence (again, like medical school, where the dictum is "See one, do one, teach one").

Another way of stating this is that the research answer treats trading as a science. We gain knowledge by uncovering new observations and patterns. The pattern recognition answer treats trading as a performance activity. We gain proficiency through mentoring and constant practice. This is the way of the athlete, the musician, and the craftsperson.

Can expertise be acquired by learning patterns from others and then gaining experience identifying them on one's own? It would seem so: this is traditionally how chess champions and Olympic athletes develop. There are also examples of such expertise development in trading: Linda Raschke's chatroom (www.mrci.com/lbr) is an excellent example of a learning device that takes the pattern recognition approach. Users of the site can "listen in" as Linda—a Market Wizard trader herself—identifies market patterns in real time. My conversations with traders who have enrolled in this service leave me with little doubt that they have acquired profitable skills, eventually moving on to becoming successful independent traders. Richard Dennis' experiment with the "Turtles" is perhaps the most famous example of how expertise (in this case, a pattern-based trading system) can be modeled for people with little market background and yield winning results.

And yet there are nagging doubts about the actual value of the patterns typically described in market books and tapes. A comprehensive investigation of technical analysis strategies ____ found very little evidence for their effectiveness. An attempt to quantify technical analysis patterns by Andrew Lo at MIT found that they did, indeed, contain information about future market moves, but hardly as much as is generally portrayed. Because pattern recognition entails a healthy measure of *judgment*, it is very difficult to demonstrate its efficacy outside of the expert's hands. In other words, the expert trader may be utilizing more information in trading than he or she can verbalize. This is certainly the case for chess experts and athletes. While they can describe what they are doing, it is clear that their proficiency extends well beyond the application of a limited set of rules or patterns.

This phenomenon has been the subject of extensive study in psychotherapy research. It turns out that there really is a difference in results between expert therapists and novices. But it also turns out that there is a difference between what expert therapists say they do and what they actually do in their sessions. This was noted as far back as the days of Freud. While he advocated a set of strict therapeutic procedures to be followed, his own published cases deviated from these significantly. What appears to work in therapy is not what the therapists focus on—their behavioral techniques, psychoanalytic methods, etc.—but the ways in which these are employed. Using any techniques in a sensitive way

that gains the client's trust and fits with the client's understandings is more important than the procedures embodied by any of the techniques.

So it may well be with trading. Expert traders may describe their work in terms of price-volatility patterns, momentum divergences, short-skirt patterns, or a nesting of cycles, but it might be the ways in which these patterns are employed that makes for the expertise. Great traders may be able to identify patterns in their work, but it is not clear that their greatness lies in their patterns.

Implicit Learning: A New Perspective

The term ***implicit learning*** began with the research of Brooklyn College's Arthur Reber in the mid 1960s. Since that time, it has been an active area of investigation, producing numerous journal articles and books.

Implicit learning can be contrasted with the research and pattern recognition perspectives described above, in that the latter are examples of explicit learning. By conducting research or by receiving instruction in market patterns, we are learning in a conscious, intentional fashion. The implicit learning research suggests that much of the expertise we acquire is the result of processes that are neither conscious nor intentional.

A simple example drawn from Reber's work will illustrate the idea. Suppose I invent an artificial "grammar". In this grammar, there are rules that determine which letters can follow given letters and which cannot. If I use a very simple grammar such as MQTXG, then every time I show a subject the letter M, it should be followed by a Q; every time I flash a T, it should be followed by an X.

The key in the research is that subjects are not told the rules behind the grammar in advance. They are simply shown a letter string (QT, for example) and asked whether it is "grammatical" or not. If they get the answer wrong, they are given the correct answer and then shown another string. This continues for many trials.

Interestingly, the subjects eventually become quite proficient at distinguishing the grammatical strings from the ungrammatical ones. If they are shown a TX, they know this is right, but that TG is not. Nevertheless, if you ask the subjects to describe how they know the string is grammatical or not, they cannot verbalize any set of cogent rules. Indeed, many subjects insist that the letter arrangements are random—even as they sort out the grammatical ones from the ungrammatical ones with great skill.

Reber referred to this as implicit learning, because it appeared that the subjects had truly learned something about the patterns presented to them, but that this learning was not conscious and self-directed. Reber and subsequent researchers in the field, such as Axel Cleeremans in Brussels, suggest that many performance skills, such as riding a bicycle and learning a language, are acquired in just this way. We learn what to do, even with great proficiency, but cannot fully verbalize what we know or reduce our knowledge to a set of patterns or principles.

Such implicit learning has been demonstrated in the laboratory across a variety of tasks. Cleeremans and McClelland, for example, flashed lights on a computer screen for subjects, with the lights appearing at six different places on the screen. The subjects had to press a keyboard button corresponding to the location of the light on the screen. There were complex rules determining where the light would flash, but these rules were not known by the subjects. After thousands of trials, the subjects became very good at anticipating the location of the light, as demonstrated by reduced response times. Significantly, when the lights were flashed on the screen in a random pattern, no such reduction in response time was observed. This was a meaningful finding, since the patterns picked up by the subjects were not only outside their conscious awareness—they were also mathematically complex and beyond the subjects' computational abilities! (Like the markets, the patterns were actually "noisy"—a mixture of patterns and random events.)

It appears that much repetition is needed before implicit learning can occur. The thousands of trials in the Cleeremans and McClelland study are not unusual for this research. Moreover, it appears that the state of the subjects' attention is crucial to the results. In a research review, Cleeremans, Destrebeckqz, and Boyer report that, when subjects perform the learning tasks with divided attention, the implicit learning suffers greatly. (Interestingly, conscious efforts to abstract the rules from the stream of trials also interfere with learning). This has led Cleeremans to speculate that implicit learning is akin to the learning demonstrated by neural networks, in which complex patterns can be abstracted from material through the presentation of numerous examples.

The implicit learning research suggests a provocative hypothesis: Perhaps expertise in trading is akin to expertise in psychotherapy. While therapists say their work is grounded in research and makes use of theory-based techniques, the actual factors that account for positive results are implicit, and acquired over the course of years of working with patients. Similarly, traders may attribute their results to the research or patterns they are trading. In reality, however, the research and the patterns are simply "cover stories" that legitimize seeing many markets over the period of years. It is the implicit learning of markets over thousands of "trials" that makes for expertise, not the conscious strategies that traders profess.

Implications for Developing Expertise in the Markets

Such an implicit learning perspective helps to make sense of Schwager's findings. There are many ways of becoming immersed in the markets: through research, observation of charts, tape reading, etc. The specific activity is less important than the immersion. We become experts in trading in the same way that subjects learned Reber's artificial grammars. We see enough examples under sufficient conditions of attention and concentration that we become able to intuit the underlying patterns. In an important sense, we learn to ***feel*** our market knowledge before we become able to verbalize it. While simply "going with your feelings" is generally a recipe for trading disaster, I believe it is also the case that our emotions and "gut" feelings can be an important source of market information.

The reason for this is tied up in the neurobiology of the brain. In his excellent text The Executive Brain: Frontal Lobes and the Civilized Mind, New York University's Elkhonon Goldberg summarizes evidence that suggests a division of labor for the hemispheres of our brains. Our right, nonverbal hemispheres become activated when we encounter novel stimuli and information. Our left, verbal hemispheres are more active in processing routine knowledge and situations. When we first encounter new situations, as in the markets, we will tend to process the information non-verbally—***which means implicitly***. Only when we have made these patterns highly familiar will there be a transfer to left hemisphere processing and an ability to capture, in words, some of the complexity of one's understandings. As we know from studies of regional cerebral blood flow, the right hemisphere is also activated under emotional conditions. It is not surprising that our awareness of novel patterns, whether in artificial grammars or in markets, would appear as felt tendencies rather than as verbalized rules.

So now we get to the traditional domain of the trading psychologist! How do we know when our feelings are conveying real information for trading and when they are interference from our conflicts over success/failure, risk/safety, etc.? It is not so simple as "tune out your emotions when you are trading". Much of what you might know about the markets may take the form of implicit knowledge that is encoded nonverbally.

This is an area that I am currently researching, and I welcome readers to stay in touch with me about the results. I will make sure updated information is posted in a timely way to my personal page at www.greatspeculations.com. I also hope to have my own book out on the topic early in 2003; my page will also keep readers abreast of that development. But in the remainder of this article, allow me to engage in a few speculations of my own regarding the implications of implicit learning for trading success.

1. ***Many are called, few are chosen*** – I believe the implicit learning perspective helps to explain why so few traders ultimately succeed at their craft. Quite simply, they cannot outlast their learning curves. If, indeed, it takes thousands of trials to generate successful implicit learning, a great number of traders would have been bankrupted by then. Many others might not survive that number of trials simply due to the time and energy required. It is impossible to hold a full-time job and generate the degree of immersion in the markets needed for implicit learning. On the other hand, it is impossible to obtain a full-time income from trading without developing the mastery conferred by years of experience. Part-time traders never develop expertise for the same reason that part-time chess players or athletes are unlikely to succeed. For purely practical reasons associated with raising a family, making a living, etc., few people can undergo the "starving artist" phase of skill-building.

2. ***Emotions interfere with trading*** – This is a near-universal observation among full-time traders and captures an important understanding. Fear, greed, overconfidence, self-blame—all of these can undercut even the most mechanical

trading. Indeed, when Linda Raschke and I surveyed 64 traders for their personality and coping patterns, the factor of neuroticism—the tendency to experience negative emotions—emerged as a major factor associated with trading difficulties. This makes sense from an implicit learning perspective. To the degree that a trader is focused on his or her fears, self-esteem, fantasies, etc., attention is drawn away from the learning process. The problem may not be emotionalism per se; there are many highly emotional, but successful traders. Rather, the issue may be the degree to which emotions interfere with one's cognitive processing by competing for attention. Focusing on negative emotions may be a much larger problem than actually experiencing them. Many outstanding traders "explode" when they make a rookie error. For them, however, the storm blows over quickly; less successful traders appear to be less able to let the issue go. As a result, they become caught in a cycle of blame, increasing self-consciousness, and further blame. As a psychologist, my leaning is to help traders experience their frustration and get over it quickly, rather than "overcome" it altogether. (In my chatroom session with Linda Raschke, I will be addressing how to accomplish this).

3. ***The advantages of learning trading vs. investing*** – If the internalization of complex patterns requires many thousands of observations across different market conditions, the challenge for the trader is making this process as efficient as possible. My sense is that there may be an advantage to learning trading, as opposed to investing, simply because short-term traders are apt to observe many patterns in the course of a single day or week. The investor, conversely, may note a pattern every few months or years, greatly extending the amount of time needed for implicit learning. This dynamic would help to explain why many of the most successful traders I have met have had experience working on the exchange floors. In the fast-paced environment of the floors, a trade may last seconds to minutes, with many trades placed per day. Complex research strategies and chart analyses fly out the window when time frames are compressed to that degree. Instead, traders become so immersed in the markets that they acquire the (implicit) ability to read moment-to-moment patterns of momentum and price change. This creates an ideal implicit learning environment—having so many patterns to read per day makes the development of expertise much more efficient—but it also might help account for difficulties floor traders often experience when they attempt to trade away from the floor. Without the contextual cues that help them process those price and momentum shifts, floor traders lose their edge—even though they may think they are employing their same, successful trading methods.

4. ***Developing technologies for training traders*** – If we look at how experts are trained in other fields, we notice a common factor: an intensive period of apprenticeship in which the student works under a master and obtains continuous instruction and practice. Consider, for example, the cultivation of expertise in the martial arts. Many years will be spent in the dojo studying under a sensei before the black belt is conferred. Instruction alternates with practice; rehearsal of

techniques alternates with the application of techniques in real-life (tournament) conditions. The online medium has created a variety of promising strategies for training traders, such as Linda's chatroom, real-time market commentary via weblog, and services that allow simulated online trading. My sense is that we will see an accelerated shift from services that emphasize trading techniques to comprehensive trading "dojos" that incorporate real-time instruction, practice, and coaching. Already we are seeing expert instruction modules built into conventional software programs such as Metastock. This move toward immersive implicit learning environments strikes me as a most promising application for peer-to-peer networks, as traders share research resources and trading experiences and learn from each other. (See www.limewire.org for more information on Gnutella and P2P networking).

5. ***Developing technologies for facilitating learning*** – This is my primary research interest in trading psychology. A broad array of research suggests that learning is mediated through the brain's prefrontal cortex, which also controls attention, concentration, planning, and other executive functions. We also know that children with learning disabilities are significantly more likely than others to possess neurological deficits associated with the frontal lobes, including attention deficit hyperactivity disorder (ADHD). Elkhonon Goldberg cites considerable research that indicates we can improve the functioning of our frontal cortex through structured exercises, much as we can build our muscles in the gym. Such exercises have been used, for example, in delaying the onset and progression of Alzheimer's disease. Is it possible, however, to develop super-states of concentration and learning in a mental gym the way that bodybuilders can hone their physiques in a weight room? I believe we can. I am currently working with Dr. Jeffrey Carmen on biofeedback strategies that directly measure regional cerebral blood flow to the prefrontal cortex. Utilizing infrared sensors to detect heat changes in the forehead (reflecting increased frontal blood flow), it is possible for traders to know exactly how much of their mental processing power is available to them at all times. Moreover, it is possible for them to learn strategies for increasing their blood flow and maximizing their optimal learning states. This would allow traders to process each trading day (or lesson) as thoroughly as possible, creating more efficient learning.

My research to date suggests that the state of mind induced by the biofeedback work is not unlike the state that people enter during hypnotic induction or meditation. It is a state of relaxed and focused concentration. Such a mind frame minimizes the impact of emotional interference at the same time that it quiets the verbal, internal dialogue that permeates much of our cognitive lives. Following Goldberg's hypothesis, I believe that the capacity to enter such states of consciousness may allow us to efficiently process novel information by facilitating right hemispheric activation, even as it dampens emotional arousal and the interference of critical, verbal thinking. This very much fits with psychologist Mihalyi Csikszentmihalyi's observations of "flow" states among highly creative and successful individuals. ***The***

learning of expertise may depend as much upon the mind state of the learner as the quality of the instructional materials.

Conclusion

I began this article with a straightforward question: How does one gain expertise as a trader? We have seen that expertise is often described as the outcome of an explicit research process or as an explicit process of acquiring knowledge about recurrent patterns. Much skill-based learning, however, is acquired implicitly, as the result of processing thousands of examples. Small children learn language, for example, long before they can verbalize rules of grammar and syntax; we learn complex motor skills, such as hitting a baseball, without ever being able to capture our knowledge in a way that could be transferred to another person.

While immersion in research and in pattern recognition can indeed produce trading expertise—a finding made clear by Schwager—the key ingredient in trading development may be the immersion, not the research or the patterns per se. If this is true, efforts to find *the* best trading system or *the* most promising chart pattern are off the mark. The ***what*** of learning trading is less important than the ***how***. If you want to become a proficient trader, the most promising strategy is to immerse yourself in the markets under the tutelage of a master trader. You need to process example after example under real trading conditions, with full concentration, to develop your own neural network.

I believe the most exciting frontier for trading psychology is the development of tools and techniques for maximizing implicit learning processes. Such techniques would assist both in the acquisition and utilization of expertise by training individuals to sustain states of consciousness in which they are open to implicit processing. As I hope to demonstrate more thoroughly in my forthcoming book, ***there are reasons for believing that experienced traders possess greater expertise than they are aware of***. This tacit knowledge, to use Michael Polanyi's memorable term, reveals itself during "hot streaks" in trading and those wonderful experiences where we just "know" what the market is doing and place winning trades accordingly. Too many traders look to emulate others. The secret to success, conversely, might just well be to gain greater access to the expertise we have already acquired implicitly and ***learn to become the traders we already are when we're at our best***.

Well, if you've followed me thus far through a lengthy article you no doubt have much of capacity for attention and concentration needed to become a master trader! I have purposely made no effort to "dumb down" this article for the mass audience, even as I've tried to steer clear of technical jargon and the intricacies of research studies. In the coming months, I hope to elaborate many of the ideas and techniques alluded to in this article, and I encourage you to stay in touch regarding new directions and developments.

With that, I will part with a last research finding from Reber. Remember those artificial grammars that people had to learn, such as MQTXG? Letters were displayed to subjects that either followed the grammar (i.e., Q could only follow M; T could only follow Q, etc.) or that did not. The subjects did not know the rules of the grammar, but over many trials could figure out which combinations of letters were right and which were wrong. Suppose, however, that the grammar is changed in the middle of the experiment, so that the new constructions follow the rules of NRSYF instead of MQTXG. Will subjects continue to display implicit learning?

The answer is enlightening. After many trials with the initial grammar, without knowing the rules, subjects will choose "MQ", "TX", and "QT as grammatical constructions while rejecting "QM", "XT", and "TQ". Once the grammar is switched, the subjects' learning goes out the window and their guesses retreat to chance levels. But with enough *new* trials, subjects pick up the new grammar and are able to recognize "NR", "SY", and "RS" as grammatical and reject "RN", "YS", and "SR". In other words, people not only learn complex patterns implicitly; they continue their implicit learning when the patterns shift. This has major implications for the development of market expertise. The markets are always changing, but as long as we stay in our learning modes, we can adapt with them.

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Market Psychology – An Introductory Analysis of Intraday Option Patterns

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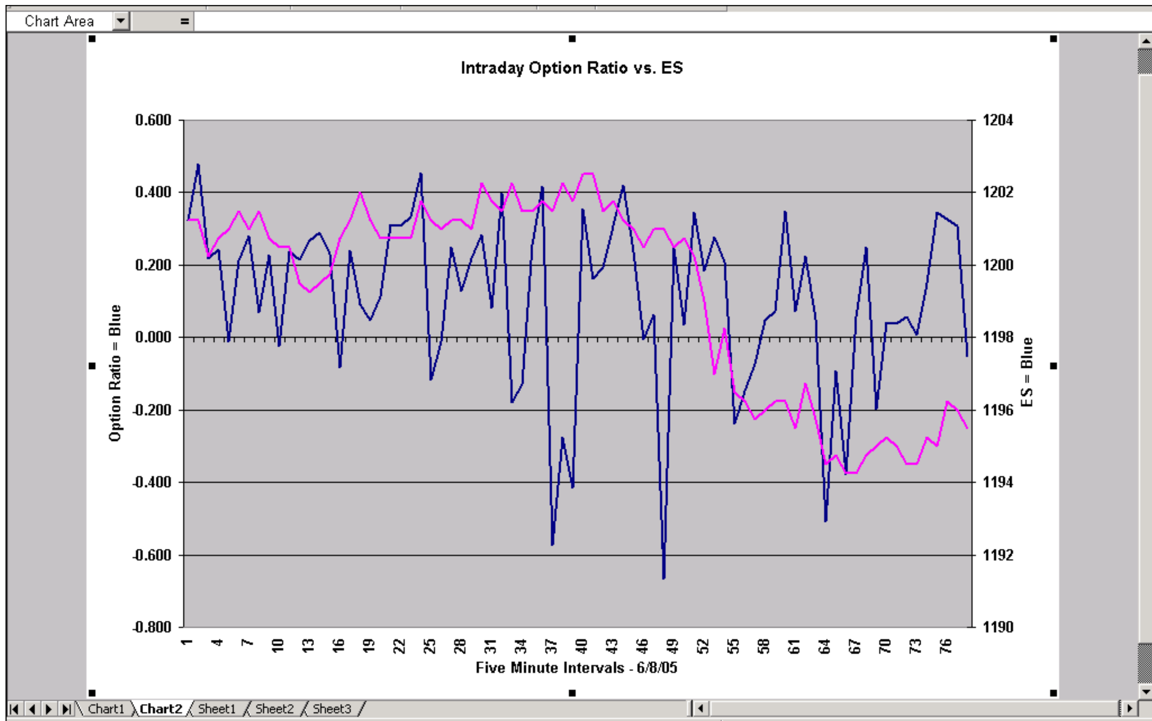
Trading psychology not only encompasses the psychology of the trader, but the psychology of markets themselves. With respect to the latter, we are looking at group psychology: the emotional patterns of all participating traders.

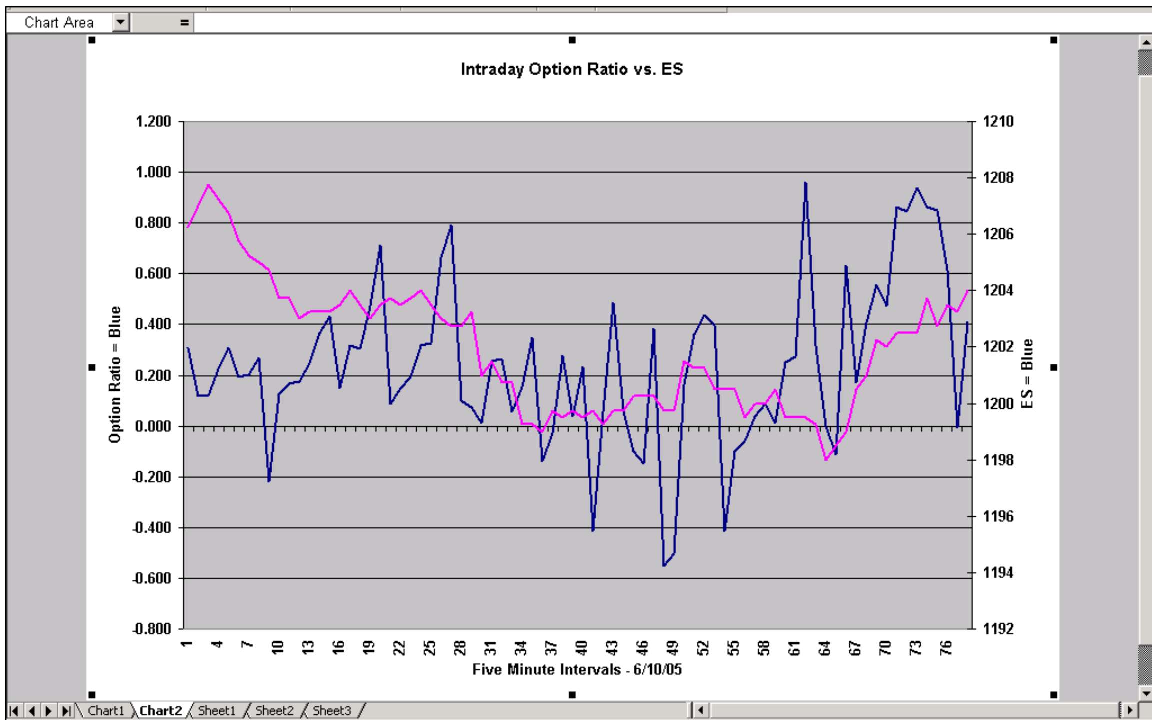
One common measure of market psychology is "sentiment". This is sometimes assessed via surveys, such as the polling conducted by Investors Intelligence. It is also more directly measured through indicators such as put/call ratios. Both are commonly held to be contrary indicators. That is, once they reach extremes of bullishness or bearishness, it is assumed that relatively few bulls or bears remain to continue a trend and the market is ready to turn.

Does this contrary reasoning apply to intraday trading? We can't take polls of traders on a frequent intraday basis, but we can measure short-term option trading. My intraday option ratio differs from traditional put/call ratios in one important respect: it looks at the difference of call volume minus put volume as a function of total option volume. Thus, the ratio can vary between +1.00 (all volume is calls) and –1.00 (all volume is puts), with zero indicating an equal proportion of calls and puts traded. For the purpose of this analysis, we sum option trading across all optionable stocks. Unlike the figures commonly reported in the financial media, option activity on stock indexes is excluded.

Below we have a chart of the option ratio for Wednesday, June 9, 2005. The blue line represents the ratio of calls to puts traded for each five minute trading period. The red line is a five-minute closing value of the ES futures. If option behavior were truly a contrary measure, we would expect to see maximum bullishness prior to the market's afternoon drop. In fact we saw exactly the opposite: immediately prior to the drop the sentiment of the market turned sharply negative.



Below is a chart from two days later (Friday, June 10, 2005).



Here we saw the market drop through most of the day before bouncing sharply in the afternoon. As the market bottomed, stock option traders were indeed bearish.

Immediately prior to the market bounce, however, we saw a sudden sharp increase in bullish sentiment. Once again, the option traders did not behave in a contrary fashion at a market turning point. Indeed, their timing seemed impeccable.

It is reasonable to assume that if sophisticated market participants had knowledge that would likely translate into a short-term market movement, they would seek to take advantage of that knowledge in ways that involve maximum leverage (and defined downside). If, for example, I knew that General Motors was at risk to have its debt downgraded, I would be sorely tempted to buy GM puts rather than short the stock. Such behavior from sophisticated participants is different from the trading of unsophisticated players who use options as a cheap way to play the market (heedless of time decay risk, valuation parameters, etc.). It is possible that the very short-term behavior of option traders could contain positive market information, even as their longer-term behavior fits a contrary pattern.

Next week I will look at a second dimension of market psychology from an intraday perspective.

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Market Psychology Questionnaire

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Note: The following questionnaire first appeared in a column I wrote for the former site WorldlyInvestor.com on January 12, 2001. Scoring for the questionnaire and an explanation of results are in the second portion of this article, after the questionnaire items.

Instructions: The following questionnaire describes 24 emotional states. Please use the scale that appears below to describe how you have felt during the last two weeks of trading. Please do not read further into this article until you have completed the questionnaire.

1 = almost never; 2 = rarely; 3 = sometimes; 4 = often; 5 = almost always

1) Happy _____	**9) Joyful _____**	**17) Cheery _____**
2) Pleased _____	**10) Content _____**	**18) Satisfied _____**
3) Energetic _____	**11) Enthusiastic _____**	**19) Lively _____**
4) Affectionate _____	**12) Caring _____**	**20) Warm _____**
5) Sad _____	**13) Melancholy _____**	**21) Depressed _____**
6) Nervous _____	**14) Stressed ______**	**22) Edgy _____**
7) Frustrated _____	**15) Angry ______**	**23) Irritated _____**
8) Regretful _____	**16) Guilty _____**	**24) Self Doubting _____**

Explanation of the Questionnaire

Please note that this is not a mental health questionnaire. It is not intended to diagnose or identify emotional problems. Instead, it is a snapshot of your state of mind during the past two weeks.

The purpose of the questionnaire is to assess the relative balance between your positive emotional states (psychological well-being) and your negative emotional states (psychological distress).

All of us experience emotional stresses. Indeed, a high degree of stress is built into many life situations (raising children in a two career family; short-term, highly leveraged trading; etc.). The challenge is not to reduce stress, since the demands we face at work and home are part and parcel of what make life meaningful. Rather, the goal is to ensure that stress does not generate distress; that our lives have a favorable balance between states of well-being and states of distress.

Every challenging situation we face is a source of stress. Every challenging situation we face is also a potential source of well-being—and a potential source of distress.

If we reduce our stress by eliminating life's challenges, we also reduce our avenues for well-being and fulfillment. A great example of this for many people is retirement. Once retired, people face few of the demands from work and raising a family. They also may experience few of the joys associated with productive work and family attachments. Without these sources of well-being, life can become dull, routine, and meaningless—which generates distress!

It is not well appreciated by most people that many "psychological symptoms" result, not from great conflicts, deficits, or problems with self-esteem, but from a relative absence of well-being. Abraham Maslow was one of the first psychologists to recognize that we need positive emotional states to function optimally.

This questionnaire can thus serve as a quick and dirty way for you to identify where you stand with respect to both distress and well-being. We commonly recognize that emotional states are most likely to sabotage trading if distress is high. Equally important, however, is the interference with trading that results from an absence of well-being.

In my own student counseling practice, two-thirds of all the people I have met with have no diagnosable emotional disorder whatsoever. They are dealing with normal life challenges—and very often the goal of our work is to expand their well-being; not "treat" their distress. Those students come to counseling asking, "What is my problem?", hoping to stop doing something wrong. Instead, they should be asking, "What makes me happy and fulfilled?" and start doing more of the right things.

What percentage of your life is spent doing the things that truly make you happy? So much of what gets people in trouble in life—addictions, extra-marital affairs, excessive debt—is a (poor) compensation for the happiness that is missing in their lives. So much of what gets people in trouble in trading is trying to use trading (or the results of trading) as a substitute for the gratifications otherwise missing in their lives. Trading can be immensely fulfilling, but it will not fill a vacuum.

Scoring the Questionnaire

To score the questionnaire, you'll be adding your responses for the three items in each of the eight rows. This will give you a total of eight subscale scores.

Row One (Items 1, 9, 17): This is your happiness score.
Row Two (Items 2, 10, 18): This is your satisfaction score.
Row Three (Items 3, 11, 19): This is your energy score.
Row Four (Items 4, 12, 20): This is your attachment score.

Now add all four of the above scores together. This is your total score for well-being.

Row Five (Items 5, 13, 21): This is your depression score.
Row Six (Items 6, 14, 22): This is your anxiety score.
Row Seven (Items 7, 15, 23): This is your anger score.
Row Eight (Items 8, 16, 24): This is your guilt score.

Now add all four of the above scores together. This is your total score for distress.

Interpreting the Questionnaire Results

The first thing you should look for in the results is the overall ratio of your well-being score to your distress score. This is a gross measure of your emotional balance over the past two weeks.

The average person reports more well-being than distress. If your ratio is 2:1 or greater, your balance is favorable. As the ratio approaches 1:1, it's saying that you're experiencing as much negative emotion as positive. That raises the odds that distress will interfere with life activities, including trading. A ratio where distress is greater than well-being suggests that something in your life is out of whack. It may be a temporary factor, such as a loss in a relationship, or it may be an ongoing state of affairs. If ongoing, some efforts at change might be in order.

Again, please realize that the questionnaire is not identifying emotional disorders. A person can have an unfavorable balance of emotions for a variety of reasons. It is when this negative balance persists over time that it becomes a potential impediment to trading, relationships, creative work, etc.

Simply looking at the balance between distress and well-being is somewhat misleading. A person might have a relatively favorable balance, but be low in both well-being **and** distress. In such a case, the relative absence of well-being is not (yet) generating emotional consequences, but may be worth addressing. Conversely, someone who is high in distress **and** in well-being may be in emotional turmoil, but handling it quite effectively.

In addition to the overall scores, it is helpful to examine each of the eight subscale scores closely. Because each question is scored on a 1 – 5 scale, a subscale score below 9 is relatively low, and a score of 12 or above is relatively high. By identifying your highest and lowest scores, you can assess where you are most generating distress and where you might be missing well-being. For instance, your well-being scores for happiness, satisfaction, and energy might be high, and your distress scores for guilt, anxiety, and anger might be low. The lower score on the dimension of attachment and the higher score on the dimension of depression might suggest that fulfillment in relationships is missing—and perhaps becoming a source of negative feelings about oneself.

Ideally, you would take this snapshot at intervals throughout the year, tracking your scores over time. This would give you a sense of whether ups and downs in your emotional states are situational or continuous. A series of scores would also tell you how your life is going overall, if your investments in life's activities are generating acceptable emotional returns. You wouldn't settle for 1% savings account returns on your retirement funds. Why settle for paltry emotional returns in life?

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Measuring Trend and Trendiness

Brett N. Steenbarger, Ph.D.

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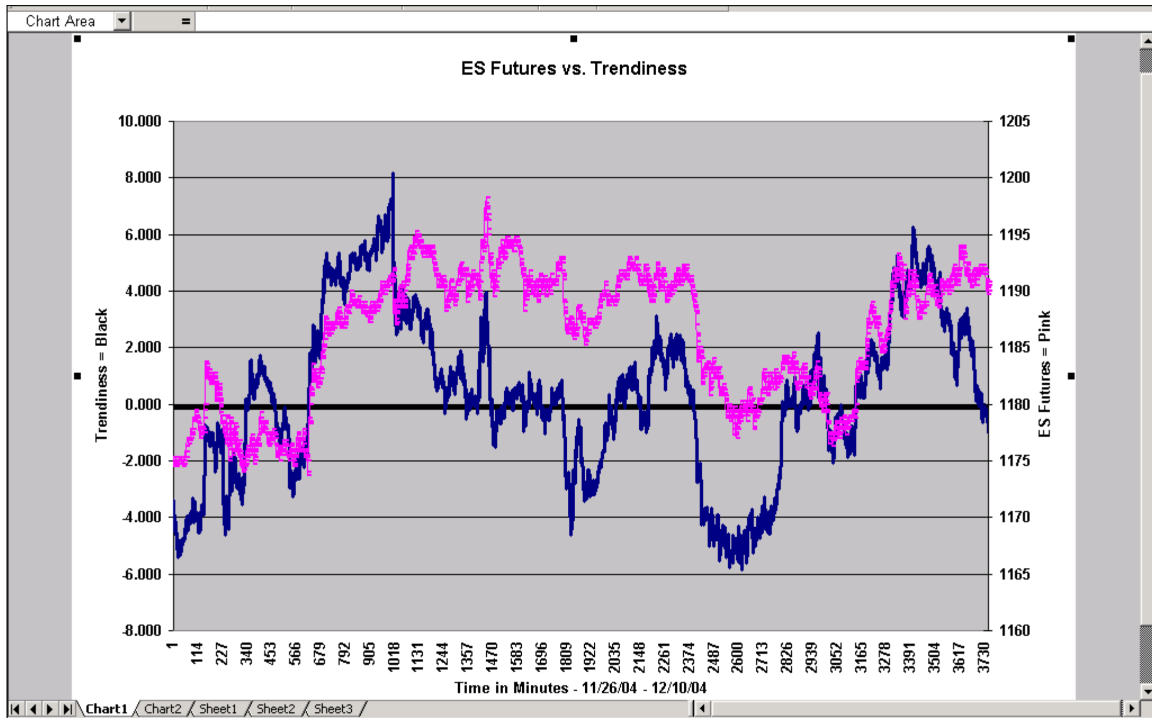
One of the challenges of short-term trading is that markets alternate between periods of directional trade (trending) and periods of non-directional trade (bracketing). Similarly, markets shift between episodes of relative volatility and non-volatility. These ever-changing cycles can play havoc with trading strategies, rewarding buying and holding at certain junctures and quick taking of profits/losses at others.

For a considerable time, I have worked on the issue of identifying trending/non-trending markets as they are occurring—and particularly as they are shifting from one to the other. My longstanding and best effort in this vein was something I dubbed the "Power Measure", which seemed to capture "trendiness": the degree to which a market was tending to trade directionally. During my research, I became convinced that thinking of trend as a noun was an error. Rather, we should think of a market's trendiness, as the tendency for direction to persist waxes and wanes. This allows us to focus on buying markets that have positive trend and improving trendiness, and selling markets that have negative trend and increasing trendiness. Similarly, it allows us to become cautious as trending periods lose their trendiness—even as they stay bullish or bearish.

My recent research has replaced the Power Measure with a new measure of Trendiness that can be computed for any tradable instrument for which price and volume data are available. I will begin posting the Trendiness Measure to the Weblog and follow its utility across a variety of markets. Its underlying logic is to break a larger period of time into smaller blocks and measure the directional persistence both within and across these blocks, compiling the results into a single metric.

In the chart below, we can see the Trendiness Measure plotted against the ES futures for the past eleven trading sessions.

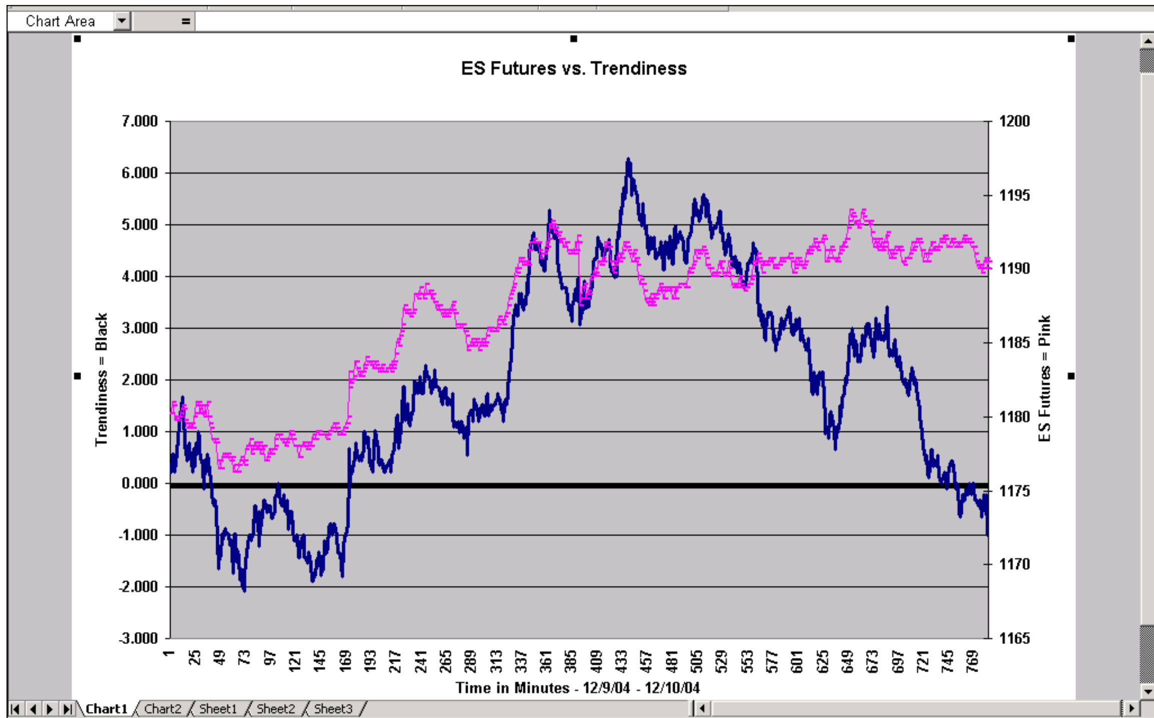


Note that the ES is drawn in pink; the Trendiness Measure is dark blue. Observe also that trendiness tops out ahead of the futures at the left side of the chart, and then it bottoms out ahead of the futures toward the right. This is precisely the pattern I had observed with the Power Measure: shifts in trendiness precede shifts in trend.

Where the new measure may excel is in capturing breakout moves. My backtesting suggests that low volume shifts from positive to negative trendiness (and from negative to positive) generally signal a directionless market. When volume and volatility expand during the directional shift, however, the market is generally signaling a breakout move. Such moves, where markets are moving in a direction and the directional persistence is expanding, represent the most profitable market opportunities.

Conversely, because the Trendiness Measure is created with a zero average value, it is possible to look at the standard deviation of Trendiness readings and establish a neutral zone, in which there is no significant trend. This, combined with a measure of volatility, could help traders identify markets where opportunity is limited.

In the chart below, I have plotted the ES futures against the Trendiness Measure for the past two days of trading. Notice how the market shifted during that time from a growing positive trend to a waning positive one to a neutral mode. This signaled weakening upside opportunity as the trading day wore on.



I will post the Trendiness Measure daily on the Weblog, so that we can follow its indications in real time. If it only helps keep traders from fading significant directional moves, it will have been worth the development effort.

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Measuring Trend and Trendiness – II

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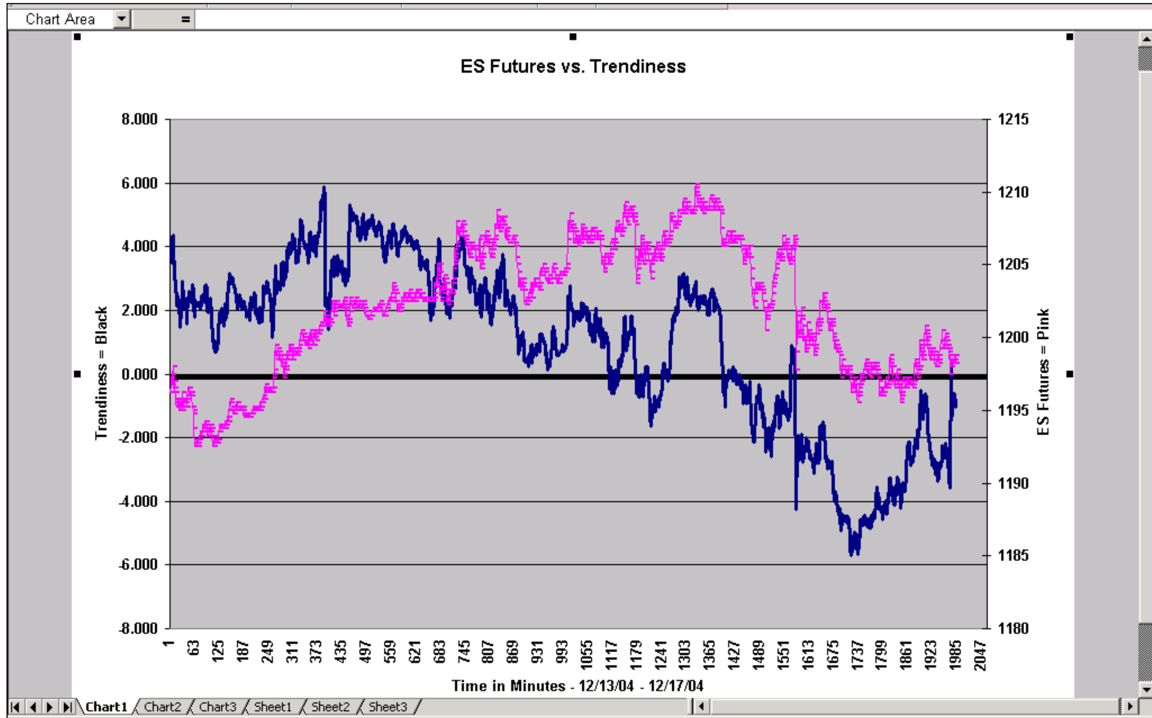
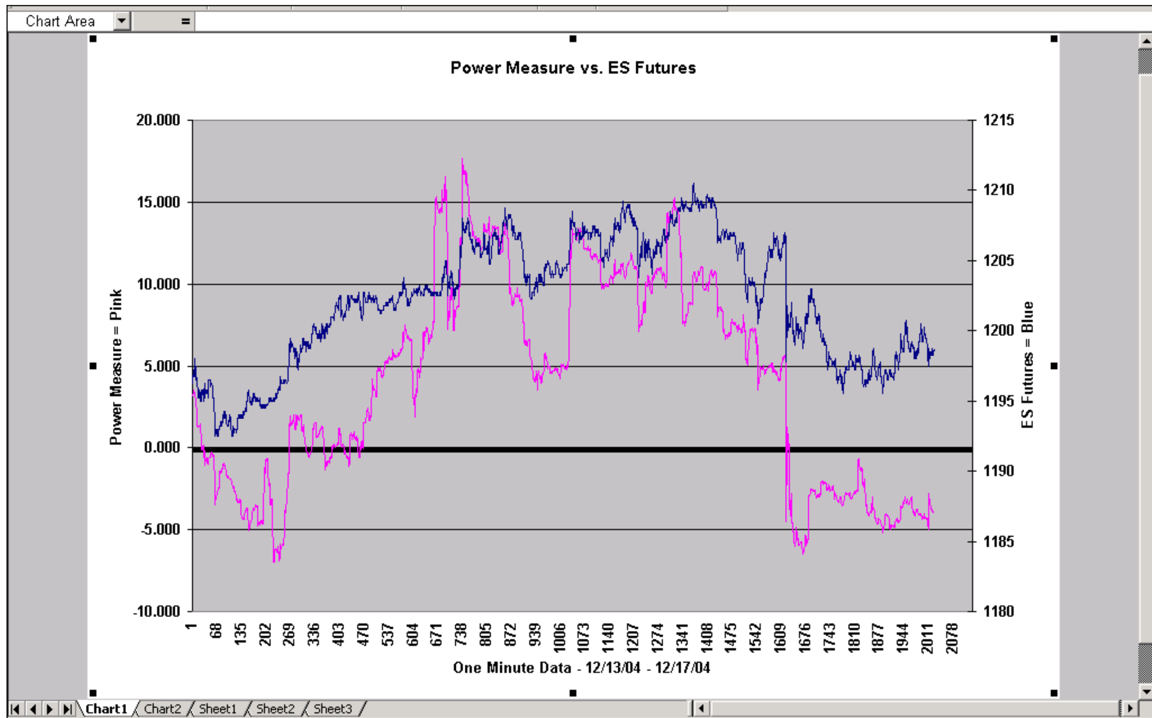
Below are two charts that look back on the past week, using two different methods for assessing the market's tendency to trend:





While there are timing differences between the Trendiness Measure (described in last week's article) and the Power Measure, they basically tell the same story over the course of the week. The market moved higher with an improving trend, then moderated its ascent (with declining positive trend), then pushed lower with the trend measures dipping into negative territory. By Friday, the trend measures lifted off their lows, remaining in neutral territory, giving indication that we were not following through to the downside.

The market can be described as being in one of five modes at any given time: bullish trend with expanding positive trendiness; bullish trend with waning trendiness; neutral trend (rangebound); bearish trend with expanding negative trendiness; bearish trend with waning trendiness. When there is a trend and trendiness is expanding in the direction of the trend, a buy and hold strategy is warranted. When trendiness is waning, but there is still a directional trending bias, a strategy of entering on countertrend moves is indicated. When the trend is neutral, the strategy is to fade extremes (i.e., movements away from a volume-weighted average price).

This analysis suggests that any attempt to have a single trading style—trend-following, countertrend, etc.—is misguided. The market cycles through the five modes at irregular intervals, rendering any fixed strategy obsolete. Fortunately, trending and non-trending modes do persist for some time, allowing nimble traders to benefit from an accurate assessment of the market's trading mode.

Understanding what the market is doing is every bit as important as predicting what it might do.

Ninety percent of all the trading problems I observe are due to two factors: overtrading (assuming opportunity where there is none) and failure to accurately identify what the market is doing. Both are liabilities of subjective trading styles. If you know that a sizable proportion of market participants operate with such subjective biases, it should be possible to define trading systems/methods that exploit such tendencies.

Brett N. Steenbarger, Ph.D. is Director of Trader Development for Kingstree Trading, LLC in Chicago and Clinical Associate Professor of Psychiatry and Behavioral Sciences at SUNY Upstate Medical University in Syracuse, NY. He is also an active trader and writes occasional feature articles on market psychology for a variety of publications. The author of The Psychology of Trading (Wiley; January, 2003), Dr. Steenbarger has published over 50 peer-reviewed articles and book chapters on short-term approaches to behavioral change. His new, co-edited book The Art and Science of Brief Therapy is a core curricular text in psychiatry training programs. Many of Dr. Steenbarger's articles and trading strategies are archived on his website, www.brettsteenbarger.com

Micropsychology of the Markets

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Like the Roman god Janus, trading psychology has two faces: one turned toward traders and their processing of market events; the other gazing upon the market and the sentiment of the crowd. In one incarnation, trading psychologists analyze the trader; in the other, they evaluate the market.

While many traders in the stock indexes are intraday participants, closing out positions by the end of the day, the majority of sentiment/market psychology tools are computed at best on an end-of-day basis. Here I'm thinking of such standards as put/call ratios, surveys of investor/trader sentiment, and money flows into various market sectors. By the time such macro measures of trader psychology are disseminated, the trade is over for the active participant.

My experience is that successful traders are exquisitely sensitive to moment-to-moment shifts in market psychology. They seem to be able to identify the ebb and flow of greed and fear within the trading day by attending to subtle market cues. What micro events could they be looking at? Are there measures of market micropsychology that could inform decision-making among active traders?

Let's consider an analogy from my book. Psychotherapists pace themselves by "markers" of client emotional processing, timing when they will comfort an afflicted person and when they will afflict that individual's comfort. I might notice, for example, that—in the midst of discussing a humiliating incident from the past—the client makes a pained face and shifts positions in her seat. Later, when I call attention to the woman's failing, abusive marriage, she makes the same face and turns slightly from me. "Are you feeling ashamed to discuss your marriage with me?" I might ask gently. "Does it feel like talking about your past all over again?" The subtle cues of facial expression and body posture alert me to the psychological reality that the woman's marriage is activating excruciating memories of her past, keeping her trapped in distress.

Markets communicate similar signals to the perceptive trader, sometimes on a minute-by-minute basis. Each market day is a narrative written in chart form, detailing the hopes realized and dashed amidst the struggles of bulls and bears. Consider the following scenarios:

- After a market move that falls within the previous day's extremes, volume suddenly dries up and the trade becomes highly non-volatile;

- Thousands of contracts trade at the offer price, with 800 more stocks trading at the offer than at their bid. Upon falling back, price returns to

that level, but now only a few hundred contracts trade there and barely more stocks trade offer than bid.

- As price moves to new lows after an extended downswing, option participants suddenly begin to snap up calls, driving the intraday put/call ratio to new lows.

- During a selling episode in the S&P eminis, traders are bidding up contract prices in the more volatile Russell and semiconductor indices.

- An economic report comes in much weaker than expected and stock indices drop immediately, but then quickly return to their original range amidst choppy action in the interest rate and currency markets.

In each of these situations, short-term behavioral cues of traders are informing the perceptive trader about the market's micropsychology. As with my therapy client, we can make reasonable judgments about the market's "state of mind" by detecting patterns in the market's behavior.

Since 2003, two important events have occurred in the stock indexes:

1. Volume in the Merc e-mini products has expanded greatly. Where hundreds of contracts once traded at various price levels, we now see thousands trade. Recognizing this, the Merc increased its maximum order size from 500 to 1500 early this past year.

2. Volatility in the indexes has contracted greatly. The option-derived volatility index (VIX) has dropped from the 20s and 30s to well below 15. It is not at all unusual to see a daily price range of less than ten S&P points—well below 1%--whereas moves of 2% were not uncommon during the bull market of the late 1990s and the subsequent bear market.

What this means is that we have more market participants chasing less market movement. This is akin to adding players to a game of musical chairs, while decreasing the number of chairs. The result is an increasingly frantic scramble for the remaining seats, which takes the form of violent runs up and down in the indexes, punctuating quiet, tense periods when the market's music keeps playing.

In this game of musical market chairs, the largest traders control the pause button. They wait for the other players to bunch together; then they grab a seat just as they stop the music. Much of the intraday movement of the market is attributable to precisely this bunching and its exploitation by large traders.

At the level of micropsychology, the successful trader can detect the dynamics of the musical chairs game, just as the therapist detects a client's dynamics. Sellers pile into a market, failing to drive it to new lows; buyers reach for stocks and can't break them out

of a range. All of those players will eventually have to puke their positions, as the market pushes them past their stop-loss or holding period comfort zones. These dynamics are announced by cues, no less than the client's marital distress.

This, I believe, is one of the greatest frontiers of trading psychology: Not the application in which traders are clients, but applications in which traders become psychologists, analyzing the markets. As each client has his or her own markers of emotional states and cognitive processing, each market day manifests its own distinctive cues. The ability to listen, formulate, and act is a core competency linking the trader and the shrink.

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My Trading System: A Brief Summary

Brett N. Steenbarger, Ph.D.

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Note: This was written December 1, 2003 and reflects the system as of the date of writing. Modifications to the system and its implementation are ongoing and are followed in the Trading Psychology Weblog.

This article describes a non-mechanical, rule-based intraday trading system for the ES (S&P E-mini) futures, though it can easily be adapted to trading the SPY ETF or the full sized SP futures. There are three major inputs to the system: TREND, INSTITUTIONAL ACTIVITY, and MOMENTUM. The basic logic of the system is to identify the short-term trend as bullish, bearish, or neutral and predicate intraday entries on the behavior of the Institutional Buying/Selling and Momentum during the day. This is explained below. The specific indicators that assess trend, institutional activity, and momentum are summarized daily in the Weblog.

There are two trading modes for the system:

- ***Short-term trend following***. This is based on research that shows that, over the short-run, trending price movements of a threshold vigor are likely to continue in their present direction, while over the longer-run, they are apt to reverse.

- ***Breakout***. This is based on research that shows that, when there is no established trend and the market is trading within a range, a break above or below that range is likely to continue in its present direction if it reaches a threshold vigor, and is likely to reverse if it does not reach this critical mass.

In an established bullish or bearish trend, a modeling approach is used to generate an expectable countertrend movement. When this movement occurs, it forms the basis for an entry. Thus, the system buys the market on pullbacks during a short-term uptrend and sells the market on bounces during a short-term downtrend. By looking at markets from the recent past similar to those of the current market, it is possible to generate a profile of past bounces and pullbacks to provide a template for when to enter the current market. The system is non-mechanical because these profiles are always changing, in accordance with recent market action. An expectable pullback or bounce in a high volatility market is not the same as in a low volatility market, for example.

When the trend reading is neutral, the system goes into breakout trading mode. To buy or sell an upside or downside breakout, the market must move to a new high or low, register breakout readings on the NYSE TICK (to demonstrate a high degree of participation among stocks), and demonstrate a plurality of individual stocks participating in the move

by registering new short-term highs or lows. I maintain a basket of stocks that I follow closely intraday. If half or less of the stocks in the basket fail to register a fresh new high or new low during a candidate breakout move, the system will not take the move. (If the Trend is going the other way, the system could even fade the move per the rules above). Only when price, TICK, and new highs/lows are moving in concert does the system take a breakout move.

Exits are primarily time based with two overrides. The same modeling process mentioned above is used to generate a profile for the duration and extent for expectable moves, given similar markets in the past. Once the duration or extent is reached and there is a very short-term loss of momentum (assuming the trade is profitable), the position is exited. The first override is if the position is profitable and volume and/or volatility expands in the direction of the trade by a threshold amount, an immediate profit is taken as soon as very short-term momentum wanes. The second override is a stop loss, which is averages 3 ES points, but is adjusted for volatility. This stop loss is moved to breakeven once the position is profitable by a threshold amount (averaging 1.5 points, but also adjusted for volatility.

The general goal is to exit under one of three conditions:

- When the trade is profitable and traders begin piling into the move, raising volume and volatility to unsustainable levels.
- When the trade is unprofitable from the outset and it is important to limit losses.
- When the trade is neither profitable nor unprofitable, but isn't moving in the expected direction in the expected time frame. The time-based stop allows the trader to "scratch" the trade before it hits the stop loss and becomes a loser.

My informal observation is that the third stop condition is the most important. If I am following my rules and trading in the direction of trend, institutional activity, and momentum, my trade should go profitable in a relatively short amount of time. Once a threshold time period is reached—and research is needed to define what that period is—the odds are no longer in the trade's favor (partly because the market momentum is being lost). Learning to exit trades *before* they are losers is a skill critical to maintaining a favorable P/L.

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On Becoming a Swing Trader

Brett Steenbarger, Ph.D.

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The following was posted to the Spec List on 12/10/03.

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Well, it's been almost three months since I stepped down from my full-time counseling activities to pursue more-or-less full-time trading. In that time I've learned a lot and met with a modest degree of success. I'm running about 60% winning trades and managing to make money overall with more winning weeks than losers. So far, so good.

Now you would think that this would bring encouragement from one's closest trading friend. Not at all. I recently received an email from a valued and distinguished friend/Spec telling me, in essence, that my trading was too frequent, in error, and headed for no good.

My definition of a friend is one who perceives the best in you, and who wants the best for you. So I could not dismiss this feedback out of hand. If there's one thing I've learned in my brief trading career it's that closing your mind to events that disconfirm your expectations (and positions) is a sure road to the poorhouse. A good trader actively *looks* for facts that disconfirm his/her hypotheses.

So I burned some midnight oil and began a little study. I took several recent time periods and compared two strategies on paper--both grounded in counting. The first strategy mirrors my recent trading, limiting trades to an intraday time frame with fairly tight stops. The second strategy uses a similar approach but takes trades that set up over multiple days, with a multiday holding period and commensurately wider stops.

The question addressed by my study was whether a very short-term strategy, capitalizing on smaller moves each day, would outperform a longer-term strategy, which seeks lengthier market swings.

Now before I launch into some findings, here's an interesting observation. If you work with 1 and 5 min data (as I do), limit your trades to short-term moves, and ground your trading in any kind of counting, you end up as a short-term trend follower. Trends with sufficient momentum tend to persist in the short-run, before reversing subsequently. When you trade intraday, you follow that momentum once it begins to manifest and ride it until it wanes. Generally, this means that you miss price bottoms and tops and ride the sweet spots of daily swings.

When you trade over multiple days, however, and again ground trading in any kind of counting, you wind up as a counter-trend trader! That is, you end up entering the market on the long side after protracted declines and you end up selling markets that have been extended to the upside. Those are the occasions in which the distribution of future outcomes is most skewed. In general, this means getting in near market bottoms and out closer to unsustainable tops. It also means trading much less frequently.

There are obvious risks to both approaches, as a function of holding period, transaction costs, and timing. But my paper simulations show clearly that overall profitability is greatly diminished with very short-term trading. What is happening is that the sum of the sweet spots in intraday moves falls short of the larger trending moves over the multiday period.

To give a simple (and humbling) example, had I simply put my active trading capital into the SP in October, 2002 when I wrote my bullish counting article for MSN ("Why This Rally is the One to Trust") and held the position to the present, I would have made far more money than by trading in and out of the market during that time and catching small daily swings.

I will continue the data explorations, but for now I have to acknowledge that I have been like the man who furiously climbs the ladder of success only to find that it leans in the wrong place.

My friend was right, and my trading was wrong. Changes will follow.

What else are friends for?

All I can do is thank my friend and wish him a happy birthday.

Brett

Personality and Trend-Following

Brett N. Steenbarger, Ph.D.

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I would describe my approach to trading as research-based trend following. By that I mean that I attempt to ride strength or weakness in the market after it has been manifested. I do not, however, automatically assume that any trend is my friend. Instead, I use historical research to distinguish between trending movements that are likely to continue and those with a high probability of reversal. This is a highly disciplined approach to trading in that it requires significant research and preparation time, as well as an ability to stick with market movements and one's game plan.

In my book The Psychology of Trading, I referred to personality traits that tend to distinguish successful traders from less successful ones. Several of these traits are also likely to influence the degree of success traders are likely to have in adopting a trend-following approach to trading. Below are several self-assessment questions that might be useful in determining whether you'll face particularly great challenges in riding market trends. Please write down "yes" or "no" answers to each of the twelve questions before reading further:

1. When something goes against you in the market, do you often find yourself venting your frustration?

2. Do you enjoy (or as a child did you enjoy) roller coasters or other thrill rides?

3. Do you often find yourself procrastinating over work?

4. Do you consider yourself moody—sometimes rather up, sometimes rather down?

5. Would you generally prefer going out and partying with friends rather than staying at home with a good book or movie?

6. Do you often find yourself apologizing to others because you forgot to do something you were supposed to do?

7. Are you generally high-strung, tense, or stressed?

8. If given the choice at a buffet, would you prefer to try exotic foods you've never heard of rather than familiar dishes?

9. When you have a task that needs to be done around the house, do you tend to take a quick and dirty approach, rather than a meticulous, painstaking approach?

10. After a losing trade, do you often feel guilty or get down on yourself?

11. Have you experimented with or regularly used two or more recreational drugs (other than alcohol) in your life?

12. Are you often late for appointments or for social plans you've made?

If you indicated "yes" to most or all of questions 1, 4, 7, and 10, you most likely score high on a trait called "neuroticism". Neuroticism is the tendency toward negative emotional experience, and it shows up as anger, anxiety, or depression.

If you responded "yes" to most or all of questions 2, 5, 8 and 11, you probably score high on a trait called "openness to experience". Openness reflects a tendency toward sensation seeking and risk-taking.

If you answered "yes" to most or all of questions 3, 6, 9, and 12, you potentially score low on a trait called "conscientiousness". Conscientiousness measures the degree to which an individual is oriented toward duty, responsibility, and dependability.

Other things being equal, the ideal personality pattern for trend following is one of high conscientiousness, low neuroticism, and low openness. A good trend-follower will stick with rules and systems (conscientious), won't impulsively enter or exit trades on the whim of emotion (neuroticism), and will trade for profits, not stimulation (low openness). In my experience, some of the best systems traders are among the least flashy people. They are meticulous and conscientious about their research and execution, and they don't let their emotions or needs pull them from their discipline.

Conversely, individuals who are high risk-takers and who crave novelty, stimulation, and action often take impulsive and imprudent risks. Very frequently, the neurotic emotions kick in after a series of losing high-risk trades. Such individuals are trading for excitement and self-validation, not just profits. Even if they are given a tested, profitable trading system, they will not be able to follow it faithfully.

System traders often focus their research and energy on defining the optimal parameters for a system's profitability. Equally important is finding a trading strategy that meshes with one's personality. Traders who are relatively risk-averse may trade shorter time frames and/or smaller positions than those who are risk-tolerant. Traders with a higher need for novelty and stimulation may benefit from trading a greater number of stocks and/or markets rather than focusing on a relative few. Are some personalities simply unsuited for trading? I would say yes, just as some personalities are not cut out to be fighter pilots or surgeons. It is difficult to imagine a trader enjoying ongoing success without the capacity for disciplined risk-taking.

It is not at all unusual to find that a trader is losing with a trend following approach because he or she is acting out unmet personality needs in the market. One of the best trading strategies one can employ is to find adequate outlets for attention/affection,

achievement, self-esteem, emotional well being, and excitement outside of trading. Sometimes traders I talk with try to impress me by explaining that trading is their entire life. They do not realize that their very "passion" and "obsession" with the markets are likely to sabotage them, imposing undue pressures and interference. If you have a trading system and you faithfully execute that system, trading should be reasonably boring and routine. Better to enjoy roller coasters outside of market hours than ride them with your equity curve!

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Perspectives From Dr. Brett

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The following are excerpts from The Psychology of Trading (Wiley, 2003).

Trading, indeed, is a microcosm of life. If you long to develop yourself, as a person and as a trader, search high and low for the immortals. Find the heroes and heroines who have lived their lives with passion, nourishing all who have come in contact with them. Discover those who have lived, breathed, and studied the markets, enriching the world with their ideas. Then hoist them on your shoulders, remaining ever mindful of your debt. You will be surprised how high you stand, how far you can see…In our debts to others, we find the true measure of our wealth.

Find your passion: The work that stimulates, fascinates, and endlessly challenges you. Identify what you find meaningful and rewarding, and pour yourself into it. If your passion happens to be the markets, you will find the fortitude to outlast your learning curve and to develop the mastery needed to become a professional. If your passion is not the markets, then invest your funds with someone who possesses an objective track record and whose investment aims match your own. Then go forth and pour yourself into those facets of life that will keep you springing out of bed each morning, eager to face the day.

It is far better to struggle in the service of one's dreams than to find instant success at meaningless work. The greatest joy in life, George Bernard Shaw once wrote, is being used for a purpose you recognize to be mighty. The greatest fields—those that are a calling and not a mere job—give one room to expand and develop oneself. There is only one valid reason for trading the markets, just as there is only one valid reason for being a psychologist, a dancer, or an architect: *because it is your calling*, the arena that best draws upon your talents and passion for self-development.

This, I believe, is the eternal allure of the markets. With a reasonable stake and an online account, each person can undertake his or her own gold rush and enact the highest entrepreneurial quest. Like salmon that swim upstream to spawn, sperm that pursue the egg, and prospectors that dig for precious metal, many will be called and few chosen. It matters not. What matters is the dignity and the dimension of soul conferred by one's noblest impulses. It is not desirable to rule in hell or to serve in heaven; far preferable, to paraphrase Ayn Rand, is to fight for tomorrow's Valhalla in order to walk its halls today.

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Planning Your Losses
Brett N. Steenbarger

(April 14, 2002) – I received dozens of emails following my recent chatroom class with Linda Raschke. The question I heard most often concerned the setting of stops. Specifically, traders were interested in learning how I set my stops, especially with trades that lasted an average of less than 30 minutes.

I believe that a key to successful trading is learning how to become comfortable with taking a loss. We know that markets, while not perfectly efficient, are largely so; complete predictability is never going to be attained by mortal traders. That makes trading a bit like hitting in baseball, where one can achieve a high degree of expertise, even while making frequent outs.

Losing traders often bring a measure of perfectionism to their work. They equate a good trading day with a profitable day. No, no, no! A good trading day is one in which you have followed your well-researched plan with focus and discipline. Good trading days, over time, will generate profits. But the uncertainty of the markets means that even the best laid trading plans can go awry. *In the short-run, you cannot control your profitability.* You **can** control whether or not you have good trading days, which **will** generate profits over the long haul—**if** you have adequately researched your strategies.

Broken clocks are right twice daily and even unresearched strategies implemented impulsively can occasionally yield profits. Those might **seem** like good trading days, but in reality, they reinforce the very qualities associated with failure.

The perfectionistic trader equates taking a loss with experiencing failure. The loss thus sets up a rash of negative internal dialogues and subsequent trades born of frustration. A more realistic trader realizes that there is a degree of uncertainty built into the market and that losses are simply a cost of doing business. The goal is to limit these losses as effectively as possible, not will them away or becoming preoccupied with them.

Stop Loss Scheme #1: Price-Based

In this article, I will cover three basic stop-loss strategies: price-based, time-based, and indicator-based. All of these can be rehearsed in advance to make the taking of losses more automatic (i.e., less emotional).

Most traders are familiar with price-based stops (though not all adhere to them!). I utilize price-based stops as a last resort in losing situations, when time and indicators won't take me out of a trade.

As I indicated in the chatroom, I view every trade as a hypothesis. If I am buying the SP on a one-minute time frame, it is because I have identified a candidate low point in that market. Perhaps I have noticed that the Dow and NYSE Composite TICK values have dropped to significant negative values, but that price has held above its prior low. I

may place my order to buy with that prior low serving as my stop point. I have hypothesized that the prior low was an important low and that this pullback is the first in an upswing. If we return to that prior low, my hypothesis was not supported and I need to retrieve my remaining capital.

A key to making such price-based stops work is setting your entries near your hypothesized high and low points so that losses will not be excessive when your hypotheses fail to pan out. On short term trades, this means that I am examining one-minute and five minute charts along with my market-maker screen for bids and asks. Remember, if the patterns you are trading only historically test out with 50% winners, you must keep the size of the losers much smaller than the average winners to make your system profitable!

Stop Loss Scheme #2: Time-Based

The second stop-loss approach makes use of time. One system I trade was designed for a holding period of 21 minutes in order to capture 3 S&P points. If the desired profit has not been achieved in 21 minutes, I exit the trade—even if my price stop has not been hit.

The logic for such a time-based stop is as follows: I try to enter short-term trades where momentum is increasing in the direction of my trade. If I have been successful, the position should become profitable fairly quickly. If the market stays flat to slightly down when I have taken a long position in a market, it means that I did not read the momentum correctly. That, too, is an invalidated hypothesis. I have learned from hard experience that when a trade stays flat, I was probably **right** about the direction of the move, but that the flat move is all the direction is going to give me. That means the next move is likely to be one that will hit my price stops. The time-based stop thus allows me to scratch a trade rather than lose a point or two.

One of the few rigid laws in trading is that risk and reward per trade are proportional to the holding period. When designing your trading approach, I encourage you to factor holding period into account as a way of suiting your methods to your personality and risk-tolerance. I designed the 21 minute system by researching the best predictors of 3+point profits in the S&P over various brief time spans. I examined dozens of indicators—volatility, momentum, volume, intraday advances/declines, various TICK figures, sector indices, intraday new highs/new lows, index futures premiums, intraday put/call figures, intraday TRIN, etc.—to come up with something that tested well and held up against independent data. Once the system was built, the time-based stop was already built in, supplementing my price stops.

Stop Loss Scheme #3: Indicator-Based

The third stop-loss methodology is indicator based. As I suggested above, many of the predictors that I utilize in my trading are intraday versions of common stock market indicators, such as advances/declines, new highs/new lows, and volume. I spend

much time testing these indicators against prospective price action, since the relationships among the indicators—and between indicators and price—are always shifting. For example, the blending of the predictors in the 21 minute system that I utilize today may not be (and probably won't be) the blending I will be using next year. My goal is to identify what has been working in the market and keep doing it—until it degrades.

A large part of the research that goes into developing such trading approaches is determining what happens when the indicators that are candidate predictors hit extreme values. Will the extreme indicator reading produce a continuation of the trend or will it predict reversal? Such information can be helpful in setting stops.

For example, one of my trading frameworks utilizes a two hour average holding period. The NYSE Composite TICK is an important predictor for this approach. I recently researched what happens when the TICK breaks out of its two hour range. Interestingly, when the TICK significantly breaks above its range, the broad market averages move upward by .20% over the next several hours. When the TICK significantly breaks below its range, the averages decline a further -.11%. (This corresponds to an average gain of around 2 SP points versus a loss of a point).

Over my testing period, the market was up 148 times and down 184 times when the TICK made a downside breakout. It was up 205 times and down 121 times when the breakout was to the upside.

Armed with such research, I created an indicator-based stop. If the TICK breaks out to a significant new high or new low against me (i.e., a new high if I am short; a new low if I'm long), I exit the trade—even if my price stop has not been hit. (In certain situations I might even stop and reverse, given the bias for short-term continuation in the direction of the TICK breakout).

If you take the time to research intraday indicators at various time frames, you can create indicator-based stops to fit your trading style and approach.

Using Stops as a Psychological Tool

Once stops are set, they can be mentally rehearsed while the trade is on as a way of ensuring that they will be honored. A good loss is a planned one; the only true market failures are the ones that are unintended.

I have reviewed the writings of a number of trading mentors: Linda Raschke, Ken Wolff, Mark Cook, Ari Kiev, Alexander Elder, Mark Douglas, and the many others interviewed in Jack Schwager's wonderful Market Wizards books. To a person, these successful traders and coaches emphasize that discipline is at the heart of exemplary trading. When you set, rehearse, and honor stops, you are building that discipline and using your losses to reinforce the qualities needed for success.

It is an irony that successful traders plan for "failure"; unsuccessful ones fail to plan.

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Playing Defense for 2003: A Psychological Strategy for Navigating Risk and Reward

Brett N. Steenbarger, Ph.D.

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Note: A version of this article was written for MSN Money in late 2002 after the market had lifted off its October bottom. The principle of identifying an initial pullback from a candidate breakout move and using that as a stop once the move reasserts itself is a trading strategy that works across a variety of time frames. Here's how I applied it on a large time frame.

On the heels of a third consecutive down year, investors find themselves Janus-faced in January, with one eye toward value and opportunity and the other toward risk management and safety. To paraphrase the military strategist Clausewitz, "Everything in investing is very simple, but the simplest thing is difficult. The difficulties accumulate and end by producing a kind of friction. . . . This tremendous friction . . . is everywhere in contact with chance, and brings about effects that cannot be measured, just because they are largely due to chance." The present market seems particularly friction-filled, with the looming chance events of war, terrorism, and international turmoil. How is one to resolve the dilemma of Janus during 2003, pursuing opportunity on one hand and maintaining adequate defenses on the other? In this article, I will draw upon insights from both psychology and market history to provide a measure of guidance for willing but wary investors.

A Tale of Two Markets

Consider two stock markets, seeming mirror images of each other:

Market A is on a tear. The NASDAQ 100 Index ($NDX) is up over 30% in less than two months, leading the general market higher over that period. Among the NASDAQ winners, tech stocks are the champions, rising almost 75% in that brief period. Small stocks are outperforming large ones, as money from an easing Federal Reserve finds its way into entrepreneurial firms. This has led the weekly advance-decline line of NYSE stocks to new all-time highs. With interest rates declining and money supply flourishing, the economy appears poised for continued growth. Though the market is selling at a robust 26.7 times current earnings, investors do not seem worried. Reflecting the vigor of Market A, over 50% of respondents to the Investors Intelligence survey are bullish, doubling the number of bears. Market A, it would seem, has its face turned upward, toward further gains.

Market B, on the other hand, is in the throes of the bear. For the first time since the 1940s, the Dow Jones Industrial Average ($INDU) is about to complete its third consecutive down year. It has been a sickening plunge, shaving 75% from the NASDAQ 100 average ($NDX) and over 40% from the S&P 500 Index ($SPX). The economy is responding only in a tepid manner to repeated Federal Reserve easing, with little if any private-sector job creation. The dollar has fallen below parity with the Euro and, in the face of global tensions, gold is trading at a multiyear high. Burned by corporate scandals, investors are shy to reenter the stock market. According to the Federal Reserve of St. Louis, during the nearly three years of market decline, institutional money funds have soared from $650 billion to $1218 billion. Even money market rates of less than 2%

seem more attractive to investors than such great franchises as Coca-Cola (KO), McDonalds (MCD), Ford, (F), General Electric (GE), and Disney (DIS), which are trading at or near five year lows. Market B, it would seem, has its face turned downward, toward further losses.

Now suppose you are an investor forced to choose between investing in Markets A and B. Which would you select? Market A, with its robust gains and heady optimism, or Market B, with its multiyear weakness and attendant pessimism?

In the light of recent history, you might be tempted to go with Market B. While the outlook for Market B is uncertain, your memory is probably all too fresh for what happens to overvalued markets filled with optimism. Better to be a contrarian than a lemming.

Only, I'm afraid Market B is **not** the better choice. In fact, it's no choice at all.

You see, *Markets A and B are one in the same*.

Today's market has risen sharply in a brief span, *and* it is hovering above multiyear lows. It features name-stocks at sharply reduced prices, *and* it is trading at over 53 times S&P's estimated core earnings. It is enjoying considerable Federal Reserve liquidity and low interest rates, *and* it is suffering from tepid growth. There is opportunity, *and* there is risk. Perhaps even more than usual, this is indeed a Janus-faced market.

Opportunities and Risks: Playing Defense in Life

How are investors to navigate these risks and rewards? Psychologists recognize that this question is part and parcel of life itself. In all our pursuits, we play offense and defense: we direct ourselves toward goals and protect ourselves from disappointment.

The strategies that allow us to cope with the risks associated with life's pursuits are known as *defense mechanisms*. Examples of such mechanisms include the ability to rationalize away threatening events, the repression of painful memories, and the projection of our more unsavory qualities onto other people. Defenses buffer a person's sense of self from anxiety, loss, and uncertainty.

Consider a first date that goes sour. Inadequate defenses would leave us overwhelmed in the face of this normal stress, creating unbearable pain over such "rejection". Conversely, overly rigid defenses may contribute to a sense of guardedness on future dates, undermining the goal of meeting a partner. Psychologists assess defenses by the degree to which they distort our perceptions of the world and subsequent responses. If a commonplace occurrence such as a bad first date causes us to radically alter our sense of self or others, we now become less capable of responding accurately to life events. The absence of a defense—or the erection of excessive defenses—creates a similar result: a poorer adaptation to life and its challenges.

The hallmark of successful coping is the *flexible* use of defenses. The person who brushes off the disappointment of an awkward first date by rationalizing that, "We just weren't meant for each other" no longer needs to doubt self or others. That person is free to pursue relationship goals unhindered by the recent setback. By creating a mental category for normal, expectable negative outcomes, the individual with successful coping is able to weather most of life's storms. A bad day on the job? A disagreement with a loved one? A loss on the playing field? All of these lose their threat value once we are able to perceive them as normal events.

This helps explain how many of the most creative, productive individuals in the arts, sciences, politics, and sports are able to reach their heights. Instead of giving up in the face of disappointment, they define it away as "a cost of doing business" and forge onward. In his book Greatness: Who Makes History and Why, psychologist Dean Keith Simonton found that the most successful individuals in their fields had the same ratio of successes to failures as their less successful peers. The difference was in their persistence. The great creators continued to cope and create despite their setbacks, eventually generating a body of contributions that set them apart. It appears that General George Patton was correct when he observed that, "Success is how high you bounce when you've hit bottom."

Offense and Defense in the Markets

Traders and investors are only as good as their defense mechanisms. A hypersensitivity to loss will take a person out of a promising position long before it has met its profit potential. Conversely, an insensitivity to risk leads to imprudently holding positions through devastating declines. Successful coping in the markets requires an ability to differentiate normal, expectable setbacks from abnormal events that possess genuine threat. If we view the current market as Market A and buy stocks, we need to stick with our offense and weather normal dips in order to ride out the bull market potential. We also need, however, to be able to switch to defense when we determine that those dips are indicative of Market B, so that we can exit with most of our capital intact.

How can we find such flexibility in our investment decisions? Here is where an inspection of market history may prove instructive.

We begin, like any scientist, with a hypothesis. My hypothesis for the current market was outlined in my column of October 25, 2002, which examined major market bottoms from 1965 to the present. I concluded that the October lows—if followed by a series of upthrust days—represented a long-term low point, with a favorable price forecast 500 days into the future. We did in fact achieve those upthrust days and, despite choppy action, have remained well above the October nadir.

The question for market defense then becomes: How much of a movement against the October-December upthrust is expectable, and how much should lead us to discard the bullish hypothesis? In Table One below, I have summarized cyclical market bottoms since 1962 and the duration and extent of their initial upthrusts and pullbacks.

Closing Low Date for DJIA	**Duration of Initial Rally**	**% Gain During Initial Rally**	**Duration of Initial Pullback**	**% Loss of Initial Pullback**
6/26/62	41 days	14.98	42 days	(9.41)
10/7/66	27 days	10.28	30 days	(4.29)
5/26/70	18 days	7.63	11 days	(7.09)
12/6/74	68 days	36.17	14 days	(5.55)
2/28/78	70 days	16.17	18 days	(6.53)
8/12/82	58 days	37.14	30 days	(7.06)
10/19/87	10 days	15.84	23 days	(12.28)
10/11/90	52 days	11.50	9 days	(6.33)
4/4/94	49 days	6.16	12 days	(4.98)
8/31/98	5 days	6.39	2 days	(5.05)
10/9/02 (est.)	20 days	20.38	3 days	(4.70)

Table One: Initial rallies from major low points in the Dow Jones Industrial Average and initial pullbacks from rally highs (measured in trading days); 1962 – Present.

We can see from Table One that initial rallies from major cyclical low points in the Dow are variable in both extent and duration. Not including the hypothesized low on 10/9/02, the average duration of initial rallies has been 39.8 days. The average gain

during these rallies has been 16.23%. The initial pullbacks from the rally point, defined as the distance from the rally high to the lowest point prior to the market making a subsequent new high, averaged 19.1 days. The average loss during these pullbacks was (6.86%). Interestingly, the record suggests that it is not unusual for the initial pullback to retrace most of the initial rally, as in 1962, 1970, 1987, 1990, 1994, and 1998. Generally, however, the duration of the initial pullbacks has been briefer than that of the initial rallies.

As of the present writing, the Dow rallied for 20 days after making a hypothesized major low on 10/9/02, gaining over 20% during that time. This represents the third largest initial gain since 1962. The two gains that were larger, in 1982 and 1974, both occurred at important cyclical low points that were followed by years of higher prices. The initial pullback took only 3 days, terminating on 11/11/02, with a decline of (4.70%), in line with the magnitude of prior initial pullbacks. Interestingly, the initial large rises of both 1982 and 1974 were followed by pullbacks that retraced only a small portion of the gains, setting the stage for continued strength thereafter.

Since the hypothesized initial pullback of 11/11/02, we have achieved rally highs in the Dow and, despite recent choppiness, have remained above the level of the pullback low, albeit by only a fraction of a percent. This then creates a useful defensive parameter. If the current market is going to be like 1982 and 1974, with a strong initial thrust from a multiyear low followed by a shallow pullback and subsequent solid gains, the Dow should not close decisively below the lows of early November (8358.95). As long as the market stays above this level, it makes sense to play offense and participate in the possible long-term, substantial gains of Market A.

Conversely, a decisive decline below the closing level of 11/11/02 would suggest a failure of the rally from the initial pullback. This break of the uptrend is not typical of market action following important cyclical lows since 1962 and suggests that the weakness is no longer normal and expectable. At that point, investors may defensively view this as Market B and not risk a more severe decline that could test or even break the October low.

To be sure, given the roughly four-year cyclical swings under consideration, we are dealing with a small sample size. Nonetheless, the coping value of decision rules based on historical analysis is not inconsiderable. By identifying initial pullbacks from market upthrusts and using these levels as stop-losses in case of reversal, the investor or trader enacts a healthy defense mechanism. This defense allows for normal, expectable moves against one's position, while offering protection from more sizable, dangerous reversals.

While we cannot know the future with certainty, especially in Janus-faced 2003, we can approach the markets in a scientific spirit. This means carefully framing hypotheses and identifying the results that either support or disconfirm our expectations. As long as we are above early November levels, I will continue to trust the rally that commenced in October in expectation of pre-election year bullish tidings in 2003. Should we break the November lows, I will retrench and protect my capital. We have no guarantee that we will get rich in this market, but we can ensure that we will not go broke while pursuing our fortunes. *That* is playing defense.

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Preparation in Trading

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Note: The following is an excerpt from Gail Osten's interview with Brett Steenbarger in the March, 2003 issue of Stock, Futures, and Options *(SFO) magazine entitled "The Windmills of Your Mind and the Pathway to Your Trades". The entire interview can be accessed at www.sfomag.com.*

Brett Steenbarger: One very simple thing—I find that actually writing out on paper, in front of me, the rationale for the trade I am placing is helpful…the point where I enter, the profit/target, the point where I would exit if the trade went against me, and the time of day of the trade—all of the basic information. If I write that down and place it in front of me, it became much easier to pull the trigger when I needed to—to take the quick profit if that was appropriate, to get out quickly with a small loss if that seemed right. Just having it on paper seemed to be correlated with more successful, more controlled trading. And so, I've gotten in the habit of writing down my trading plans and following what I write down—almost as if they are instructions given to me by someone else.

<<Brett's Note – November, 2003: Since this interview, I have expanded the "writing down" technique considerably. From the pre-opening through the market close, I keep a running, written log of all my thoughts and perceptions about market action. It is time-stamped so that I can refer back to the diary and cross-check my perceptions with market action at that time. Basically, it's a trading blog that I write for myself only. The running commentary helps me identify strengths and weaknesses in my thinking, but also seems to help me think more clearly. I am convinced that we process information differently when writing than when either thinking silently or speaking aloud. Many times, a connection will come to me when I'm writing that I would have never thought of otherwise. The written market log is thus a stimulus to creative thinking and a way of keeping myself actively engaged in the market.>>

Gail Osten: What about pre-trading preparation?

Brett Steenbarger: Incredibly important is the amount and type of preparation traders perform before the markets open. Overnight I'm doing my research. I'm planning my trading for the day. The more time I spend in the research process and the more I write that down and formulate it clearly in my head, the more likely it is that I will do some good trading that next morning. And so I put myself in the habit of placing my research in diary form. Now, of course, I put that research online as a weblog…Each day my trading journal is on the Web with the indicators and the ideas on the basic strategy for the day. Is the market trending; is it leaning toward the long side, the short side? That

has helped tremendously in systematizing my thinking—making decisions clearer when the action starts.

<<Brett's Note – November, 2003: The weblog now includes midday updates and a summary of my actual trades as well as preopening reports on research and market strategy. It is not at all unusual for my day's trading strategy to not fully crystallize until I have written the weblogs. Using the written diary to summarize and integrate findings from indicators assessing trend, momentum, and institutional activity has been perhaps the single most helpful personal step I have taken toward profitable short-term trading.>>

Quantifying Mind: The Neuropsychology of Trading

Brett N. Steenbarger, Ph.D.

Note: This is a version of a posting to the SpecList from April, 2003.

Abstract: This is a lengthy posting on brain activity as it relates to trading. While recent advances in functional magnetic resonance imaging are revealing important brain-behavior relationships, such research is difficult to conduct with traders. Use of thermal biofeedback holds particular promise in objectively quantifying the degree to which individuals are engaging in executive cognitive functions. Preliminary data suggest that such biofeedback accurately discriminates between haphazard/discretionary and rule-governed/mechanical trading methods.

One of the traditional challenges research psychologists have faced is the reliance upon the self-report of experimental subjects for data on such variables as moods, intentions, etc. With the advent of functional magnetic resonance imaging (fMRI), it has become possible to track cerebral blood flow patterns among subjects as they perform various tasks. This allows researchers to see which areas of the brain are activated during standardized tasks that draw upon particular cognitive functions.

Such standardization is necessary when assessing the functioning of particular patients. For instance, a task called the PASAT (Paced Auditory Serial Addition Test) presents subjects with a series of numbers. Each number in the series is followed by n seconds of silence before the next number is presented. The task is for subjects to add the series of numbers mentally. This tests auditory processing speed, attention, and calculating ability. By obtaining fMRI pictures of normal subjects engaging in the PASAT, we have a sense for the brain regions that are activated when engaged in these functions. When a brain damaged patient is asked to perform the PASAT, the fMRI reveals those relevant brain regions that are not receiving adequate blood flow. Interestingly, when efforts at cognitive rehabilitation are undertaken, the brain damaged patients can regain some of their skill at tasks such as the PASAT. This is corroborated by fMRI pictures that show new regions of blood flow to those brain areas associated with auditory processing and attention.

The implications of this work are profound, suggesting that the brain is much more plastic than has been assumed in the past. With imaging, we can now see the brain develop new blood flow patterns. Obsessive-compulsive patients, for example, who have undergone successful behavioral psychotherapy reveal structural brain changes before and after their treatment. In the future, such changes might even constitute an objective measure of whether a pharmacotherapy or psychotherapy has been successful.

One of my longstanding passions has been to identify the brain regions that are activated during trading, and particularly the patterns of brain activation that distinguish successful traders from their less successful counterparts. It is reasonable to believe that traders who experience emotional interference with their trading, for example, would display different

blood flow patterns under fMRI than traders who maintain a reasoned discipline in their work. It is also reasonable to believe that neophyte traders might show different blood flow patterns than their more experienced peers. (Research, for example, finds that novel tasks tend to be processed in the right cerebral hemisphere, while routine tasks are processed dominantly in the left. Intriguingly, negative emotional experience also tends to be lateralized to the right).

There are significant logistical difficulties in studying trading with fMRI. Imaging is very expensive, and getting on the magnet at busy medical centers is not easy. Perhaps even more daunting is the challenge of placing an entire trading station inside an MRI tube and creating realistic trading conditions. Finally, there is the challenge of creating standardized trading tasks, so that different individuals can be assessed on the same metrics.

I've mentioned on the List (and in my book) that one way I've tried to begin exploring the brain/trading relationship is through a novel form of biofeedback. Most biofeedback measures physiological arousal, and is used to track patterns of anxiety for the purpose of relaxation. Forehead skin temperature biofeedback, however, evaluates minute shifts in skin temperature on a real time basis. This reflects increases or decreases of cerebral blood flow to the frontal regions of the brain, which are the mind's "executive center". The logic behind the biofeedback unit is that skin temperatures should increase when subjects are engaged in such processes as concentration, judgment, planning, and verbal reasoning. Conversely, forehead skin temperatures should decrease when subjects are frustrated or otherwise emotionally aroused and when they are physically active.

I commissioned an engineer to build such a machine (since none are commercially available) and have been engaged in using it for research purposes. Most recently, I have created standardized tasks for the unit that involve varying degrees of emotionality, activity, attention/concentration, etc. By taking forehead skin temperatures every 10 seconds during task performance and calculating the standard deviation of the readings, I can compare the distribution of temperature scores under one set of task conditions with those derived from other tasks. The readings strongly support the underlying rationale of the device: tasks requiring the greatest mental effort consistently generate the highest temperature readings. The biofeedback unit appears to be an accurate means for quantifying the degree to which subjects are exercising their executive brain functions.

An interesting side note: Very high skin forehead temperature readings that are sustained over a period of minutes are invariably accompanied by major mood shifts, in which subjects report feelings consistent with being "in the zone". They report an unusual degree of clarity, focus, present-centeredness, and ease of thought. I should emphasize that this is not a placebo effect: the digital readings of the machine are hidden from the subjects so that they have no idea of whether their readings are high or low.

In my most recent experimentation, I attach myself to the biofeedback unit while placing a variety of trades in the market. Unlike fMRI, there is no logistical problem with being hooked up to the machine while trading. Specifically, I tried to create two very different

trading conditions: 1) uncertain, frustrating trading where I made decisions intuitively on the basis of common technical oscillators and chart patterns, and 2) structured trading where I traded a tested, mechanical system. To keep conditions constant, I traded over identical time frames in similar midafternoon markets. During the seat-of-the-pants trading, I started with relatively high forehead skin temperature readings, which deteriorated over the course of the trade. In the structured trading, however, my readings continued significantly higher throughout the trade. In fact, the average readings were much higher than the highest levels recorded during my standardized concentration tasks. Objectively (and subjectively) I was in the zone--but only when trading was structured.

The reason for this is a bit subtle. In the seat-of-the-pants trading, I didn't really know what to look for to base my decisions and had to flit from screen to screen to pick up (probably random) cues of strength and weakness. My attention was highly divided, and--because the trade duration was short (less than a half hour)--I felt rushed in my decision-making. During the mechanical trading, however, I knew exactly what to follow on a minute to minute basis and stayed glued to a customized screen that contained all the relevant data for decision making. My attention was not divided, and I experienced no sense of time pressure or frustration. (Yes, the mechanical trading has also been more profitable).

Much more experimentation remains to be performed. How are the biofeedback readings (reflecting sustained concentration and mental effort) affected by large increases in market volatility or position size? By holding period? By the nature of the trading system? Do successful traders sustain significantly different readings from unsuccessful ones? How much individual variability in readings occurs during hot and cold trading periods?

Perhaps the most intriguing questions involve training. Can we train people to sustain mental effort and access "the zone"? Would such training improve trading performance by enhancing trader discipline, pattern recognition, and problem-solving? Can dysfunctional trading patterns (blaming self for bad trades, failing to take valid trading signals, impulsively trading when valid signals are absent) be eliminated by reprocessing anxiety during states of high frontal activation? This, I believe, represents an important frontier for trading psychology.

Brett

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Reasoning and Trading

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"Think before you act!"

"Count to 10 before you say something you'll regret."

"Ready, aim, fire!"

"I'll think it over."

In many situations we face in daily life, we recognize that action must be guided by reason. Thinking is a powerful antidote to impulsive behavior. A perfect example is the breaking of habits. We learn to overcome compulsive eating or drinking by making ourselves first think about the consequences, then consciously choose an alternate course of action. Without clear thinking about priorities, it is far too easy to fall into patterns of behavior that offer short-term rewards but longer-term consequences.

So it is for traders. Having worked with dozens of traders over the past year, I can vouch for the fact that, among active market participants, overtrading is the single most common problem they face. Overtrading in this context means putting trades on where there is no explicit edge—and even no valid rationale—for the trade. Generally, the reasoning behind the excessive trade is nothing more than, "I felt like it was going up." What the impulsive trader fails to realize is that this is no different from the dieter's excuse, "I felt like eating the chocolate cake."

A common occurrence for me is that I will go into a trader's room and observe him/her trade. Although the trader may be struggling and losing money every day, generally they make money while I am watching them. This is not because I am offering such grand market insights; usually I do not impose my market views on a trader. Rather, I require the trader to verbalize the reasons behind his or her trade. This has the natural effect of slowing down their trading and making them distinguish between genuine trade ideas and mere trading impulses.

From my vantage point, all trading ideas boil down to variations on two themes:

1. The market is trending, and we want to buy pullbacks in an upward trend; sell bounces in a downward trend;
2. The market is range bound, and we want to sell moves toward the top of the range once buying dies out; buy moves to the lower end of the range once selling dries up.

If I am employing solid reasoning in my trading, I want to assess the status of those themes in both the time frame that I am trading and in the larger time frame. A trend in a shorter-time frame may be part of a range in a longer frame; a range in the short time frame may be a consolidation within a larger trend. Not infrequently, your ideas regarding targets for a trade will come from the assessment of the larger time frame.

A sure-fire way to identify impulsive trades is by their absence of a well-conceived exit. Ninety percent of the effort is going into getting into the trade—the entry—because the purpose of the trade is to be in the market, not to make a profit. The impulsive trader seeks action, not results. Because exits are associated with the cessation of action, they get short shrift.

Conversely, the reasoned trade contains several components:

1. An assessment of current price behavior: Is buying pressure expanding or contracting; is selling pressure expanding or contracting; is price volatility expanding or contracting?
2. An assessment of market conditions at shorter and longer time frames: trending or bracketing?
3. A target for the trade: A move to new highs/lows for a trend trade; a move toward a price mean for a bracketing trade.
4. Criteria for stopping the trade: Conditions that will convince you that your trade idea is no longer valid
5. A decision of resource allocation to the trade: How much of your capital you are willing to put at risk on the trade idea.

If talking these five components out loud before each trade would lead you to trade less often and would lead you to trade far differently from how you're currently trading, there is a likelihood that you are overtrading. There is definitely something to be said for having a feel for trading. That doesn't mean, however, that feelings substitute for market knowledge and awareness.

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Remapping the Mind: Cognitive Therapy for Traders

Brett N. Steenbarger, Ph.D.
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Active traders of futures and options make frequent rapid decisions, requiring a high degree of mental clarity. Reviewing their losing trades, they often find that they have deviated from their established strategies and plans, talking themselves into decisions that they would never make in paper trading rehearsals. It is acutely frustrating to replay the day's session and see the "obvious" signals missed and the impulsive decisions made. "What was I thinking?" is the common refrain. At times, it seems as though we are not in our right minds.

According to cognitive therapists, that is exactly what happens. In the heat of trading, we shift our mind states, activating automatic thought patterns that can sabotage the best-laid trading plans. The goal of cognitive therapy is to identify these thinking patterns, intercept them, and replace them with more constructive alternatives. In this article, I will review the basics of this approach and explain how traders can become their own cognitive therapists.

Schemas: The Mind's Maps

Cognitive therapy begins with the notion that people have a basic need to make sense of their world. Our need to explain life events is so strong that sometimes we will prefer superstitious and mystical explanations to none at all. A classic example comes from people who suffer from a problem known as panic disorder. In the midst of completely non-threatening situations, such individuals can suddenly experience overwhelming fear. Because the reaction seems to literally come out of nowhere, patients with panic disorder invent their own explanations for their attacks. If their panic occurred in a mall or in a car, they will assume that malls and cars are the problem and avoid these settings. Eventually, the list of offending situations multiplies to the point where panicky patients refuse to leave their houses.

The webs of ideas that organize our perceptions are known as schemas. We can think of schemas as mental maps. In a sense, they are the filing cabinets in which our experiences are stored. The Swiss developmental researcher Jean Piaget described intellectual growth as a function of the development of our schemas. When we first encounter new information and experiences, we try to assimilate these to existing schemas. For example, if we are expecting a market to decline, we may interpret a short-term rise to a new high as a potential head in a head-and-shoulders formation. If, however, it is no longer possible to fit the new information with our expectations, we eventually accommodate—or alter—our schemas to explain our experience. Thus if the market breaks sharply higher rather than turns down following the suspected "head", we might abandon our bearish position and trade the upside in a breakout mode.

Ultimately, all of us are heirs to our experience. As we grow older, we develop increasingly rich and complex schemas, helping us understand more of life's experiences. The categories in our mental filing cabinets reflect the life events we have encountered. People who have grown up feeling secure and loved will internalize positive schemas about themselves. Someone who has experienced violence and rejection will tend to develop a more negative mental map. Most of us have met individuals with low self-esteem who can barely accept a compliment. Their filing cabinets simply can't accommodate positive feedback; it doesn't fit their experience.

The challenge for traders of stocks, futures, and options is that we inevitably bring our schemas to our trading. How we interpret the world will color how we interpret market action. To see how this can disrupt trading, let us consider the example of a trader I will call Tony.

Perfectionism: The Hidden Saboteur

Tony did not grow up in a violent, abusive home. Indeed, his parents loved him and provided emotional and financial security. Both parents, having come from less-than-affluent backgrounds, were determined to provide their family with the material comforts they had never enjoyed. They worked hard and emphasized achievement. Growing up, Tony was always a good student and received praise for his scholastic and athletic accomplishments. His parents were strict with him and required long sessions of nightly homework. This, however, paid off and Tony was able to attend a highly competitive college and business school.

Despite his achievements, Tony was frequently unhappy. He often felt that he did not live up to his parents' expectations. Secretly, he doubted that he could live up to his father's example. Even when he achieved in school or on the football field, he feared that he would subsequently fall short. Determined to do his best, he pushed himself mercilessly. He was stricter with himself than his parents had ever been.

Tony developed an interest in trading during his business school education. He experienced early success in a bull market and came to see trading as a means for achieving his lofty financial goals. Soon after trying his hand at full-time trading, however, Tony found his emotional patterns interfering with his trading. Despite developing a trading system that he had carefully backtested and paper-traded, Tony repeatedly violated the system, placing low-percentage trades at times and sometimes avoiding valid signals. On such occasions, he berated himself and felt like a failure. Even when trades went well, he found himself second-guessing his decisions. Maybe he should have traded larger size; maybe he should have traded the more volatile and profitable contract.

Of the schemas we bring to trading, perfectionistic ones are among the most corrosive. Depressive ("I'm worthless") and anxious ("Something bad is going to happen to me") schemas are obviously negative and bring painful emotional consequences. Perfectionistic schemas, however, masquerade as virtues. Tony *prided* himself on his

high standards and achievement motivation. He saw these as answers, not as part of the problem. What he didn't realize is that the message of the perfectionistic schemas—"I'm not good enough"—was the real source of his motivation. As long as those schemas were operative, he would never truly accept himself. Indeed, many of Tony's worst losses occurred after he increased his trading size following several consecutive wins. The profits were not enough, so he had to put more on the line. When an inevitable loss occurred, it wiped out much of the previous gains.

In my book *The Psychology of Trading* (Wiley, 2000), I tell the story of a Kansas bar that I once frequented. A blue neon sign on the window promised "Free Beer Tomorrow". When patrons came the next day, however, the bartender informed them that the free beer was *tomorrow*. Needless to say, no one received free beer at that bar.

The motto of the perfectionist might well be "Self Esteem Tomorrow". "If only I am better," the schema suggests, "then I'll be OK." When better arrives however—a new high in the equity curve, a gain in the market—the underlying feeling of not being good enough persists. Tony believed he could never measure up to his father, and that colored all of his self-evaluations. Though he believed himself to be motivated by achievement, he was, in fact, motivated by a nagging sense of inferiority. Like the bar patrons, he kept coming back, only to find the promise of self-esteem one day removed.

Identifying Negative Schemas

Piaget would say that Tony is assimilating his trading outcomes to his perfectionistic schema. Instead of concluding that he really is successful and competent, he rationalizes away his victories and dwells on his shortcomings. After one particular successful trade, he seemed joyless. "Yeah," he reported to me, "that's great. But will I be able to keep it up?"

The first step in altering negative schemas is identifying them in the first place. Cognitive therapy views the negative thinking that emerges from depressive, anxious, and perfectionistic schemas as habit patterns. Catching ourselves in the act of misinterpreting events and then interrupting those habitual thinking errors is half of the change process.

How can we recognize a problematic schema when it first arises? The pioneer of cognitive therapy, Dr. Aaron Beck, found that one hallmark of negative schemas is *automatic thinking*. Once these schemas are activated by life events, there is a cascade of automatic, negative thoughts that generate anxious, depressed, and angry feelings. These thoughts have a scripted quality, almost as if a tape plays inside our heads. Very often the same thoughts will emerge for very different situations, suggesting that this is not true independent reasoning, but a byproduct of schemas derived from previous life experience.

Tony, for example, produced a number of automatic thoughts that began with the words, "I should have." He frequently second-guessed his trades, even when these were

profitable. One of his favorite—and most destructive—exercises was reviewing the trading day and identifying all the trades he "should have" made. These trades were not signaled by his systems and, indeed, would have required omniscience of a real-time trader. Nonetheless, Tony prided himself on doing this after-hours homework, convinced that reviewing the markets would make him a better trader.

Very often people are not aware of their automatic, negative thoughts. By keeping a cognitive journal, traders such as Tony can become better observers of their habitual thinking. Figure One (at the end of this article) depicts one such journal page, and sample entries that might have been made by Tony. The psychologist Albert Ellis organized his journals in an ABC format, where the first column represented the Activating Event (the current situation); the second column described the Beliefs about this event (the person's self-talk, or internal thought process); and the third column captured the Consequences of these beliefs (anxious feelings, missed trading signals, etc.). By filling out a journal entry every time a targeted problem occurs (a bad trade, feelings of frustration regarding trading), traders train themselves to become better self-observers.

One of the best ways for traders to begin a cognitive journal is to integrate it with a trading journal. Many traders keep a journal of their trades, noting the setups they are trading, the entries, trade sizes, parameters for stops, exits, and profits/losses. Review of such a journal often yields helpful insights into one's trading strengths and weaknesses. By adding ABC columns to the traditional trading journal, traders can now monitor the relationship between their trading results and their state of mind. Tony, for example, was shocked to discover that his worst trading losses typically came after he "motivated" himself (i.e., criticized himself for not making enough money) and increased his trading size and frequency. Such observations were crucial in helping him recognize that the perfectionism he took as a virtue was actually holding him back.

This latter point is very important. People tend to identify with their negative thoughts, failing to recognize that their thinking is an integral part of their problem patterns. A real-time trading journal that incorporates a description of the thoughts, feelings, and behaviors at the time trades are placed, managed, and exited allows traders to review their self-talk and identify its consequences. *Equally important, the filling out of a journal during problem periods requires an interruption of the automatic thoughts*. By adopting the role of self-observer and identifying the consequences of negative thoughts, the trader begins the process of divorcing the self from schemas. It is a real step of progress when people can say, "This isn't really me thinking; it's that silly tape going through my head." Interrupting a pattern is the first step in divesting it of its strength.

<u>Changing Negative Schemas</u>

The beginning work in cognitive therapy, maintaining the journal, allows traders to identify their negative thoughts as they occur and observe their destructive impact.

Once traders become proficient at interrupting their automatic thinking, however, the next step is to turn their thinking around.

There are a number of techniques for altering disruptive thought patterns, as summarized in Figure Two at the end of this article. This can be accomplished in cognitive therapy is adding a fourth column to the journal. Ellis incorporates a Column D, in which the individual Disputes the negative thoughts and beliefs that are generating anxiety, depression, and frustration. This disputation is an active process in which people challenge and undermine their negative thoughts. In a sense, the trader plays devil's advocate to his or her negative thoughts, questioning their validity and reminding themselves of their consequences.

In my own practice, one of my favorite techniques for disputation is to have people role-play conversations they would have with others in similar situations. For instance, I asked Tony to carry out a mock conversation he might have with a trader-friend who had missed a breakout move. Interestingly, people who become immersed in their own negative thoughts can be very positive, encouraging, and supportive of others who face the same dilemmas. In talking with an imagined friend, Tony was invariably constructive, telling the friend that this was a learning experience, that he should feel good about honoring his stops, and that he should be proud that his overall track record was positive.

Once Tony could enact his positive conversations with others, I had him perform a guided imagery exercise in which he pretended that *he* was the best friend he was talking with. We then rehearsed conversations with friend-Tony, helping him talk to himself the way he knew how to address others. By making such self-talk a regular part of homework exercises, Tony was able to cultivate a new, more positive cognitive pattern.

As is so often the case, however, it was not any great therapeutic strategy, but life itself that provided Tony with the best method for changing his perfectionistic schemas. During a visit to his parents' home, he went to the bathroom and happened to look inside the cabinet above the sink. There he noticed a bottle of Prozac that had been prescribed for his father. In a flash, Tony recognized what should have been obvious all along: his father was an unhappy, depressed man. Burdened by the same self-doubts that tortured Tony, the father had reached a point where he needed the medication to get through the day.

Suddenly Tony's father was no longer on a pedestal. He was a vulnerable human being, just like Tony. Instead of driving himself to match his father's inflated image, Tony indicated for the first time that he didn't want to end up like his dad. As bad as it was to undergo trading losses, Tony found it worse to contemplate the possibility of living the remainder of his life as a depressed human being.

Armed with this realization, we conducted homework exercises where Tony was to stop himself whenever he encountered an automatic thought that had sabotaged his

past trading. After taking a few deep breaths and focusing himself, he confronted the automatic thought by asking, "Is this my thought, or my father's thought?" and "Will this thinking help my life, or will it make me a depressed person?" Instead of identifying with his negative schemas, Tony turned them into adversaries. In a very real sense, Tony retained his motivation to outdo his father, but he had redefined the challenge. Instead of outdoing his father's perfectionism, he became committed to leading a happier life than his dad. As he found success in this goal, his trading benefited as well.

Keys to Success in Cognitive Therapy

Cognitive therapy is not the answer to all problems involving negative thinking. Some people suffer from chronic depression or anxiety and require more intensive psychotherapy and/or medications. For many people such as Tony who face performance-based conflicts, however, cognitive work can be a rapid and powerful means for self-change. In these situations, several factors are responsible for the success of the cognitive approach:

- ***Self-monitoring*** – Daily monitoring one's thought processes with a cognitive journal is very helpful in targeting specific thought patterns for change and helping traders recognize the connection between their negative schemas and their trading problems. Active traders of futures and options often feel as though they do not have the time for such self-work, but without clear targets for change, efforts at self-improvement are apt to be diluted.
- ***Homework*** – Research suggests that there is a direct correlation between the completion of cognitive homework assignments and the eventual success of cognitive therapy. The idea is to develop new, positive thought patterns, and this can only be accomplished through repetition. Indeed, I would venture to say that such therapy is unlikely to be successful unless traders make a daily commitment to self-work. It is difficult to imagine unlearning longstanding patterns without such consistency of effort.
- ***Emotional Arousal*** – Research studies have also found that the challenging of negative thought patterns is most likely to be successful if it is conducted in an emotionally charged fashion. Simply filling out a cognitive journal and not truly *confronting* one's schemas is likely to prove a futile, intellectual exercise. The key to Tony's success was his *emotional* recognition that he could no longer emulate his father. Once perfectionism was more of a threat than falling short of his father's image, he was empowered to change his longstanding patterns.

In over 20 years of conducting brief therapy and writing numerous academic journal articles and book chapters on the topic, I can state with relative certainty: ***The quickest way to change a pattern of thought or behavior is to make it your enemy***. Once we no longer identify with our problem patterns, it is easier to interrupt them, challenge them, and enact more promising alternatives.

One exercise I found helpful in my own trading was an annual trading audit where I added up the precise dollar amounts of my losing trades that I could attribute to

destructive trading practices. I wrote that number down next to my trade station and, each time I was tempted to fall into the old traps, I asked myself if I really wanted to add to that figure. This put the brakes on many ill-considered trades.

In that spirit, I leave you with a homework exercise. Once you have targeted a few automatic thoughts for change, tape a set of cue cards to the wall beside your monitors. One automatic, negative thought will be written on each card, and beside each thought will be an estimate of the amount of money that thinking pattern has cost you. Before each trade, simply scan the cue cards and nix any impulses to trade if those thoughts are dominant. If you can perform such an exercise with consistency, you will be well on the way toward becoming your own therapist.

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Figure One
A Sample Cognitive Journal

Column A **Activating Event** (Description of the situation in which a problem pattern occurs)	**Column B** **Beliefs** (The thoughts and self-talk that accompany the situation)	**Column C** **Consequences** (The emotional and behavioral results of holding the beliefs)
I doubled up on my standard SP position, fading a low volume rally in an overbought market.	I've been making a couple of points here and there, but my equity curve has stayed relatively flat the last month. I need to become more profitable.	I immediately started feeling more stressed while the position was on, as each tick moved my account by more than I was used to. I exited in a panic when the market spiked higher on a buy program, then watched in frustration as the market retreated to my target zone.
I obtained a buy signal on the ES on the breakout above the Globex highs. I waited for a pullback to make my entry instead of taking the signal immediately.	I was criticizing myself for having missed the Globex session lows and told myself I could make up some of the difference by waiting for a pullback.	The market continued higher after the breakout and I missed an additional three points before entering, leaving me feeling like a fool.
I took a four-point profit on my NQ position; the market continued higher by three points after my exit.	I regretted not holding the position longer and maximizing my gain. I began thinking, "None of my positions are working out the way I want them to."	I started feeling down after taking the profit and tried to boost myself by making a midafternoon trade in a low volatility market. Got stopped out on a whipsaw and felt even more frustrated.

The cognitive journal has two functions: 1) It can be used to review past problems and identify the automatic thoughts that have sabotaged trading in the past; and 2) It can be used in real time to intercept negative thought and action patterns as they are occurring. Keeping a cognitive journal is useful in targeting specific schemas for change. Adding a fourth column allows traders to challenge negative beliefs and rehearse and act upon more positive alternatives.

Figure Two
Techniques for Disrupting Negative Thought Patterns

- *Shifting Gears* – Most negative thought patterns are accompanied by distinctive emotional and physical manifestations. As soon as you notice these manifestations, it is useful to shift emotional gears by discontinuing whatever you are doing and engaging in an alternate activity. For example, you might leave the trade station and perform some vigorous physical exercise. By interrupting the flow of negative thoughts and placing yourself in a different state, you can often return to the situation in a different mode.

- *Using the Cognitive Journal and Cue Cards* – One purpose of the cognitive journal is to remind traders of the potential consequences of negative thought patterns. Often, a graphic emotional reminder is enough to halt traders in their tracks. Cue cards that can be kept handy during trading can serve as a mental "pre-flight checklist" to ensure that traders are in the right mindset for their work.

- *Performing Stress Inoculation* – This is a technique where traders actually mentally rehearse and combat their negative tendencies prior to placing trades. Invoking and coping with these patterns in advance serves as a psychological inoculation, making it easier to deal with problematic schemas when they emerge in real time.

- *Making Patterns Your Enemy* – I often encourage people to associate their most negative patterns with some hated person in their lives, imagining that their self-talk is actually coming from someone they can't stand. Vividly imagining that negative thoughts are coming from an "enemy" makes it easier to "answer back" and stand up for oneself, beginning the process of building more positive schemas.

Note: These can be useful and powerful techniques, but no psychological methods can substitute for rational trading strategies grounded in research and trading experience. Many traders who experience doubt and fear experience these feelings ***rationally****, reflecting the inner realization that they lack adequate preparation in the markets. Trading psychology can help you make the most of a good trading system or method, but cannot substitute for one.*

Repetition and Greatness

Brett N. Steenbarger, Ph.D.

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The following is an excerpt from a roundtable article published in the July, 2003 issue of Stock Futures and Options (SFO) magazine. The entire article can be accessed at www.sfomag.com.

As a psychologist and an active trader, I am my own trading coach and client. Much of my self-work has little to do with resolving conflicts from the past, learning coping skills, or other such therapeutic staples. Rather, I find myself working on consistently implementing the cognitive, emotional, and behavioral patterns that distinguish exemplary performers across a variety of disciplines. There is a rich research literature on the psychological factors that distinguish creative, successful individuals in the arts, sciences, sports, and politics. Dean Keith Simonton, psychologist at the University of California, Davis, and K. Anders Ericsson, psychologist at Florida State University, are two of the more prolific contributors to this body of knowledge. Both emphasize that high levels of achievement in any field are the result of continuous, intensive, deliberative practice, in which skills become internalized to the point of becoming automatic.

An insightful article about legendary baseball pitcher Sandy Koufax appeared in the May, 16, 2003 issue of *Investor's Business Daily*. Koufax observed, "As much as you can do to get the variables out of the delivery, the easier it is to repeat. That's the key to a repeated golf swing or pitching motion or batting swing…The pitcher wants to do exactly the same thing every time." Jane Leavy, author of Koufax's autobiography, noted, "The hardest thing in sports is no single act, it is the replication of that act."

Working on my own trading, I have been able to achieve a higher degree of replication by developing a set of rules to guide my entries, exits, and position sizing. Most of these rules are based on research that I have performed regarding the trending qualities of the SP and ND futures. In general, I want to be entering directional markets when the market's trendiness is expanding, exiting when the trendiness is waning, and adding to positions when the short- and intermediate-term trends and trendiness are aligned.

To keep myself grounded in these rules, I maintain a daily weblog ("blog"), which is an online diary that allows me to follow each trend-related measure, assess its status, and formulate my ideas for the coming day's trading…The blog forces me to focus on basics and "get the variables out" of my trading. I have found that it greatly reduces my internal mental chatter during trading by taking much of the discretion and potential impulsivity out of decision-making…It also makes all of my market mistakes quite public—a useful tool in cultivating humility!

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Responding to Adversity – A Personal Account

Brett N. Steenbarger, Ph.D.

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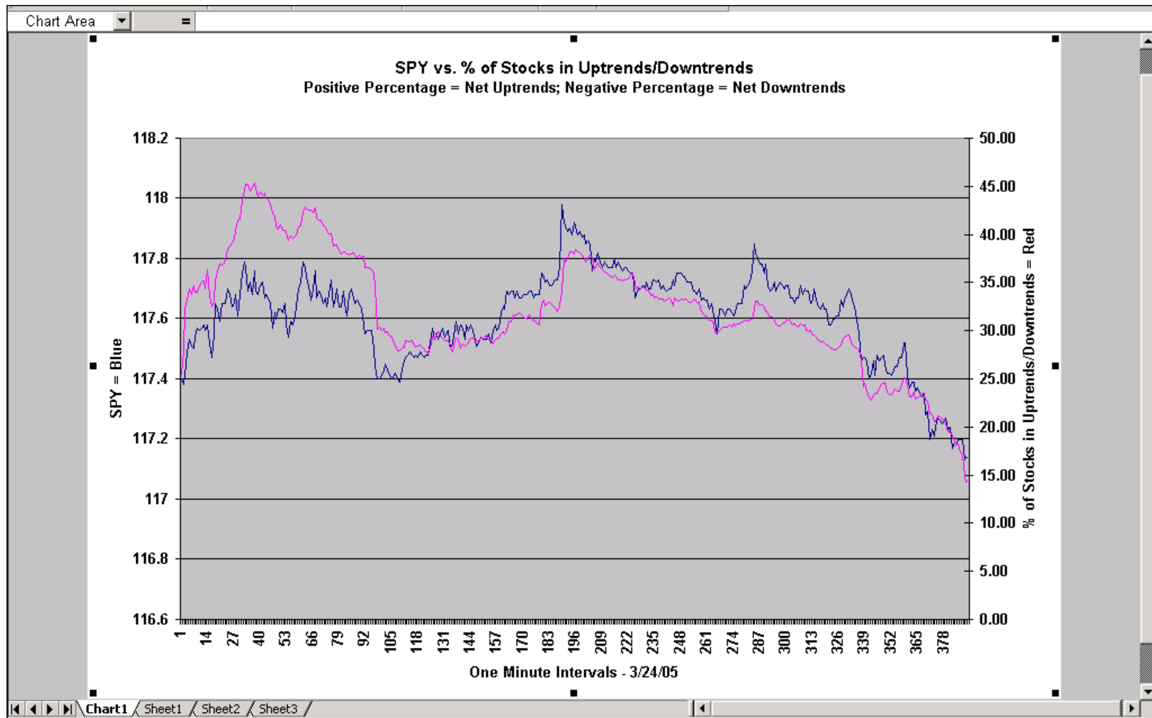
This past Thursday (3/24/05), I traded poorly. I didn't lose a tremendous amount of money—I'm pretty good about getting out when I'm wrong—but the money was not what concerned me. What gnawed at me was that I was completely wrong about the market's morning direction.

Partly it was a problem of getting "married to an opinion". I saw that there had been substantial weakness the prior day, and I expected that to carry over to Thursday's trade. With each push up early in the morning, I faded the moves. Several trades briefly went in my favor only to see the market bounce even higher. Before I knew it, I was nicely in the red. *Worse yet, I couldn't figure out why*. Remembering the medical advice I had so often given other traders—"Above all else, do no harm"—I packed it in for the day. It didn't help matters that my opinion was borne out in the afternoon trade.

The errant experience led me to scan the market to try to identify where I had gone wrong. The first thing I noticed was that the vast majority of stocks that I scanned were rising in the morning, even as I was trying to get short. I thought to myself, "Suppose I constructed an indicator that told me how many stocks were in an uptrend vs. downtrend during the day. Would shifts in the trending behavior of individual stocks lead moves in the large indexes?"

After a couple of misfires, I figured out a way to measure "trending" on a short-term basis and apply it to the large universe of S&P and NASDAQ stocks, including both small cap and larger cap issues. Below appears a chart of the indicator for Thursday's trade:



Notice how, early in the morning, the % of issues trending higher (the red line) was steadily rising. We then dipped and made a second high, but fewer stocks by that time were uptrending (though at no point during the day were more stocks downtrending than uptrending). The market gradually rose to its high of the day midday, but again fewer stocks were participating in that upward movement. For the remainder of the day, the proportion of stocks trending higher steadily eroded, as did the S&P 500 price. Had I waited for the proportion of stocks to disconfirm price gains in the index, my idea of selling would have borne fruit.

Of course, this is only one day, and I need to go back in time and see if this indicator similarly catches periods of strength and weakness in the market. At the very least, it invites all sorts of research questions, such as:

- Is there a threshold percentage of stocks that need to be trending in a direction to maintain that direction?
- Do markets with a net positive but waning percentage of uptrending stocks behave similarly to markets with a net negative and growing percentage of downtrending stocks (and vice versa)?
- When markets show a relative balance between uptrending and downtrending stocks (indicator near zero), do breakouts in the indicator lead or lag price breakouts in the indexes?
- How does the behavior of the indicator parallel the action of such measures as the NYSE TICK? If a large number of stocks tick higher, but this does not cause a higher proportion of stocks to trend higher, can you conclude that you are getting a bounce in a downtrend—and vice versa? (This is actually the best of all questions).

This may or may not be a fruitful direction for research, and I hope to report results on the Weblog over time. My point in this article, however, is not to tout a new measure. Rather, it is to look at how traders respond to adverse outcomes in the market.

The most successful traders I have worked with have two qualities:

1. They hate losing and do not easily accept defeat.
2. Once defeated, their competitive instincts drive them to figure out what they did wrong and correct it.

I can think of several traders who went through cold spells and took breaks from trading as a result. They examined themselves and their trading during the breaks and traded differently when they returned. Most often, they traded better after their break, exceeding their previous positive performance. In a very real and important sense, they had remade themselves.

Contrast this response to adversity to two other kinds of traders, both of whom are consistently unsuccessful:

1. The first kind of trader shrugs off the losing performance after initial disappointment. He rationalizes the loss as a "growing pain" or a "learning experience". He focuses attention on what he didn't do wrong, and minimizes his poor overall performance. By the end of the day, he doesn't feel so badly about what happened, which readies him to repeat the performance in coming days.

2. The second kind of trader hates losing and goes into a tirade after hitting his loss limit for the day. Perhaps he even continues trading beyond this limit. He fumes about the market's unfairness or about his own poor trading. He brings his bad mood home with him and only begins to feel better once he has shifted his attention away from the markets. Feeling better the next day, he finds the problems recurring in subsequent trade.

The problem with these two types of traders is that they never get to the point where their drive to win impels them to re-analyze themselves and the markets. In fact, even as I am writing this, I'm thinking that perhaps their desire to not lose is greater than their desire to win. In either case, they never take that constructive step where their competitive motivation pushes them to figure things out.

In fact, as I think about S&P and NASDAQ traders who have not succeeded in the business, I cannot identify a single one who responded to loss by systematically studying the market, figuring out what might have gone wrong, and then applying their insights to the market.

Imagine that you begin hearing a clattering noise under the hood of your car and sudden sluggish performance as you accelerate. Can you imagine chalking up the aberration to "just one of those things" that happen to cars? Would you purposely focus on things about the car that you liked? Or would you fuss and fume over your car's behavior, stubbornly pushing the car to drive beyond its limits?

Of course not. You'd pull the car over to the side of the road and look under the hood.

Traders who respond to glitches in their trading without pulling over and without looking under the hood are doomed to eventual breakdown.

Do you review, in detail, trades that went wrong and systematically identify what you could have seen in the market to avoid the problem? Do your trading failures push you to develop new insights into the market? I'm not talking about superficial bullshit self-analyses, such as, "I wasn't patient enough in my trading", or "I needed to have better discipline". That's not looking under the hood.

Here's what looking under the hood is: You sit there for hours figuring out a way to measure the short-term trending behavior of every operating company that trades, gathering the data, and then putting the data in a form that makes potential success. And if that effort fails, you figure out why and spend another few hours refining the idea.

Would you expect to win at chess without studying chess games? Would you expect to fix cars without observing and testing the various systems? Do great coaches and players win without observing tapes of their performance—and tapes of their opponents?

Winners respond to adversity with effort—creative effort. Not all efforts are rewarded by the markets, but lack of effort is always punished over time. Markets are not always fair, but—in the end—they are mercilessly just.

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Reversals in Minds and Markets
Jon Markman and Brett Steenbarger

Note: This is a draft of an article that appeared in July, 2002 on the MSN Money (www.moneycentral.com) website.

Consider the following scenarios:

- A highway patrol officer aims his radar gun at passing cars to determine who is speeding. He notices a vehicle traveling 45 miles per hour in a zone that only permits 30 mph. As it passes the patrolman, however, the car accelerates to 50, then 60, then 70 miles per hour. The officer lets out a sigh of relief, noting to his partner, "Well, we don't have to worry. He's going down the road so fast, he'll have to slow down eventually!"

- A psychologist meets with a client who has been complaining of feelings of depression. For the past several weeks, she has not been eating well and her sleep has been disrupted. At this meeting, however, the client divulges that she now can barely get out of bed and is entertaining regular thoughts of suicide. "That's good news," the psychologist responds. "You're feeling so bad, you've got to be improving shortly!"

- For the second time in a row, the stock market declines over 3% in a single session, with the number of issues making new 52 week lows swamping the number making annual highs. Volume and volatility have picked up on the decline and a well-known market analyst concludes, "We're seeing a capitulation. This is a great time to buy."

In all three examples, people are making inferences about a reversal of trend based upon its increasing trajectory. Interestingly, where the first two situations seem absurd, the third has been a staple of recent market commentary. It has also been a major reason why investors have held onto positions through the recent decline, reluctant to sell when a bottom might be at hand.

In this article, we would like to explore the psychology of reversals and shed some light on how change occurs in minds and markets. We believe that such an analysis will help investors frame their market strategies in the light of Wednesday's dramatic reversal and the raised hopes it has fostered.

Reversals and Emotional Change

The idea of the positive feedback loop is common to many approaches to psychotherapy. Problems occur when people become locked into coping patterns that create negative consequences. As the consequences mount, so do their faulty efforts at coping, creating a downward spiral.

A classic example is insomnia. Once a person finds that she cannot sleep, she begins to worry about sleeping and engage in a variety of actions to *make* herself sleep. Of course, it is difficult to feel naturally drowsy when one is trying with all one's might to induce rest, so the very efforts at coping help to maintain wakefulness.

Ironically, the best treatment for such insomnia is to convince the person to cease all efforts at making sleep happen. Simply having the individual perform a boring task is sufficient to get their minds off their insomnia and naturally lapse into drowsiness and sleep. The key to "cure" is reversing the faulty coping strategy with sufficient emotional impact and/or repetition to ensure that the new pattern becomes self-sustaining.

Research conducted by cognitive psychologist Daniel Wegner of the University of Virginia suggests that much personal change has this ironic quality. When we try to control an action, as in attempting to not think about an unpleasant person or event, the results typically backfire: an *ironic process* leads us to focus even more upon them. People change, he observes, by reversing their coping efforts and thwarting this ironic process.

British psychologist Michael Apter, has proposed a Reversal Theory of motivation that helps make sense of this irony. His research suggests that emotional states are organized in polar extremes. During a given day or week, people shift from one pole to another, as in the case of a person moving from excitement to boredom. Much of what psychotherapists accomplish is a shifting of individuals from one pole to another, enabling them to access new thoughts and behaviors.

A dramatic example of Apter's reversals can be found in the research of University of Texas psychologist James Pennebaker. He found that people who make efforts to avoid expressing painful emotions wind up experiencing *more* of those emotions, taking a toll on their mental and physical health. Interestingly, however, individuals who write about their suppressed emotional pain in journals find relief from their experiences and subsequently enjoy greater health. Once again, cure is found by radically reversing people's coping efforts.

Reversals in the Markets

Markets, we propose, operate on the same principle of psychological reversal as people. In a sense, this is Newton's First Law of kinetics applied to minds and markets: an object in motion tends to stay in motion with the same speed and in the same direction unless acted upon by an unbalanced force. It is the unbalanced force of the therapist, nudging the person toward their opposite pole, that creates reversals of mood and behavior.

So what provides the unbalanced force among markets?

Here we turn to Edgar Peters, author of *Fractal Market Analysis* and Senior Manager of Systematic Asset Allocation for PanAgora Asset Management, Inc., for an answer. He explains that market participants are arrayed at a variety of time frames. Some trade on a

minute-to-minute basis. Others hold positions for days, still others for weeks or longer. While the magnitude of average price changes vary as a function of holding period, the distribution of those changes is shaped similarly across time frames.

What holds the market together, Peters explains, is that low probability events at a short time frame—extreme rises or declines—are normal events at higher time frames. When a steep short-term rise or decline occurs, relative values for selling or buying are created for participants at longer time frames, *who then enter the marketplace*. They provide the unbalanced force that reverses the short-term trend. In a very real sense, traders and investors at longer time frames are therapists for the market. By entering the markets in force when prices become attractively high or low, they become agents of reversal.

One important, Newtonian implication of this line of reasoning is that trends will stay in place until price extremes are reached that convince the longer time frame participants to enter the fray. Markets, it would appear, are prey to the same ironic process as people. While traders and investors are actively seeking tops and bottoms, markets inexorably continue their rises or declines. Only the reversing effects of the longer time frame participants can nudge a market trend to its opposite pole.

Reversals in Market History

A study by Paul F. Desmond in the February 26, 2002 issue of Lowry's Reports supports this notion of market reversals. Going back to 1938, Desmond investigated all instances of significant market declines. He specifically looked at the distribution of volume among rising and declining stocks each day and the distribution of total point changes among rising and declining stocks.

Desmond found that major market declines were typically accompanied by a series of days in which 90% of volume was concentrated in falling stocks and 90% of price changes were concentrated in declining issues. This suggested to him that panic and indiscriminate selling was a hallmark of the latter stages of market declines.

He also found, however, that declines did not terminate until there were one or more days in which 90% of volume was concentrated in rising stocks and 90% of price changes were concentrated in rising issues. This, to use our phrase, was the unbalanced force that created the reversal. Vicious downtrends tended to remain in place until such bargain conditions were created that buyers (presumably from longer time frames) piled into stocks.

Could the market lows have been predicted in advance? No, although they can be identified quickly once the strong upthrust days have occurred. Market bottoms do not exist independent of subsequent market action. It is the mass buying noted by Desmond that creates bottom points in the markets. "Days of panic selling cannot, by themselves, produce a market reversal," Desmond notes, "any more than simply lowering the sale price on a house will suddenly produce an enthusiastic buyer…It takes strong Demand, not just a reduction in Supply, to cause prices to rise substantially."

What Does This Mean For Investors in Today's Market?

Desmond notes that the September, 2001 decline did not produce a single day in which 90% of volume and price changes were concentrated in falling stocks. Similarly, during the rise that followed the September lows, there were no strong demand days in which 90% of volume and price change were concentrated in rising issues. This led Lowry's Reports to conclude that we had not seen the ultimate market bottom, despite the severity of the September drop. In retrospect, their call was correct.

In the recent market, the closest we came to a day with 90% of volume concentrated in declining stocks was July 2nd, when the figure was in the high 80s. The sharp rise on July 5th saw 90% of volume concentrated in rising issues, but then the meltdown accelerated without a single 90% day in either direction. Most notably, the rise this past Wednesday did not meet the criteria of vigorous buying despite the magnitude of the price changes achieved. This raises the very uncomfortable proposition noted by Desmond that the market's eventual fall may not be broken until we have seen a series of down days with 90% negative volume and price—enough of a decline to bring the longer term bargain hunters out in force.

"Look at the extent of the decline we have had," Desmond exclaims in wonder, "and we havent even had the panic stage yet! … We had the long bull market where investors were trained like Pavlov's dogs to buy every dip and it takes a long time for people to unlearn those lessons." Indeed, Desmond notes, this may explain why major bear markets tend to occur once in each generation.

If Wegner, Apter, Pennebaker, Newton, and Desmond are correct, only significant reversals create change. Prices have retreated significantly from their highs, but not yet so significantly that buyers are stampeding to pick up the bargains. Wednesday's rally may have been therapeutic for traders and investors, but it was not the therapy Paul Desmond—and market bulls—need to see.

Risk and Success

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Sometimes you hear people debate whether trading success is attributable more to trading techniques vs. psychology. The answer, of course, is both—but the point where the two intersect is risk management. A huge percentage of trading success or failure can be laid at the doorstep of risk management. A recent book on risk management (that I'll be reviewing next week) observed that, across different traders and trading firms, 90% of all profits were attributable to 10% of all trades. While traders would like to think of themselves as making money on a majority of their trades, the reality for frequent traders is that a minority of trades are winners—and it is the few large winners that produce a favorable profit/loss statement (P/L).

The book goes on to observe that, if 10% of trades account for a majority of profits, it follows that a large percentage of trades have to be "scratched". A cardinal skill in trading is recognizing that a trade is wrong before it hurts the P/L. Time and again, I have seen good traders exit trades when the trades fail to move in their direction; bad traders exit only after the trade has moved against them.

And yet it is equally true that, if 10% of trades are going to account for the lion's share of profits, traders must be willing to milk very good trades. This not only means finding the sweet spot where you can "cut your losses and let your profits run"; it also means being willing to trade sufficient size to maximize returns from a good trade. The worst traders I know put on their maximum size when they're trading at their worst. Typically, they have just lost on one or more trades and now are trying to get the money back. The best traders are able to identify superior trading opportunities—and are patient in waiting for those—and will put size on to take advantage of these. This is how 10 good trades more than make up for 90 scratches and losers.

A favorite trading story that I tell concerns a very successful trader. He promised to tell me the secret of trading success. Of course, my curiosity was piqued and I asked, "What is that?" He responded with a question: "What the ratio of your largest position size to your normal size?" "Three-to-one", I told him. He smiled. "Consider 20-to-1," was his advice and his success formula.

I completely believed him. The reason he was successful had nothing to do with finding a better oscillator, regression analysis, or chart formation. He was successful because he had the ability to identify—and wait for—particularly profitable opportunities and then take maximum advantage of those. While 20:1 position sizing is—and will always be—rich for my blood, I think the principle is valid: success is partly a function of putting size on for the logical, not psychological, reasons.

This is one reason trading is so difficult. It is an unusual blending of traits that allows someone to be prudent with risk, scratching trades that don't move promptly as expected, while at the same time milking opportunity. It is easy to find traders who are risk-averse and stick with their one and five lot positions; it is also easy to find traders who will swing size freely, including times when they are frustrated with the trade. What is rare is to find the mix: the ability to accept and limit the 90% of occasions that don't work, and yet act aggressively on those 10% of times when there is a move to be exploited.

What is true for size is also true for time. Much can be learned simply by identifying how long a trader has held onto winning vs. losing trades. If a trader is quickly exiting trades that aren't going in the desired direction, the average holding times for such trades should be quite low. Conversely, with the good traders, it's not unusual to see a trading log that registers 10% of trades that are held for a lengthy period of time. Invariably, these are the winners that contribute significantly to the overall P/L. The truly unsuccessful traders will also display a minority of trades with long holding times—and these will be the losers. I recently asked a trader why he hung onto a long position for an unusually long period of time. He looked at me somewhat quizzically and replied, "Because I had the bottom!" He was willing to sit through a choppy trade as long as it went in his direction and as long as nothing happened to convince him that he didn't identify the bottom. That one trade made his entire day.

Perhaps this is a truism in all of life. The people who I have seen who have been very successful in dating and relationships have been willing to go on very many first dates, but not so many second and third ones. They "scratch" the unpromising dates and then focus their energies on the 10% that look worthwhile. The same is often true with respect to career and company success. A successful individual may take on ten projects over the course of a year, but focus efforts on a single initiative when it yields promise. A company may roll out ten products and quickly pull nine, making significant money on the one that finds ready acceptance in the marketplace. Even successful artists and inventors, researcher Dean Keith Simonton found, tend to churn out creative efforts, deriving their fame from the small minority of works that attract the attention of an appreciative world.

Successful traders risk manage their market exposure. Successful individuals risk manage their life exposures. It is not just how much we undertake, but how much we scratch in life that determines our ability to benefit from the episodes of promise that come our way.

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behavioral change. His new, co-edited book The Art and Science of Brief Therapy is a core curricular text in psychiatry training programs. Many of Dr. Steenbarger's articles and trading strategies are archived on his website, www.brettsteenbarger.com

Seeking the Path of Least Comfort

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One of my favorite quotations comes from the philosopher Friedrich Nietzsche, who observed, "In peaceful times, the warlike man turns upon himself."

Comfort is a near-universal value. We seek comfortable clothes, comfortable cars, comfortable beds, and comfortable lifestyles. We want to retire in comfort, and when we see people upset, we want to comfort them. Hotels? Sofas? Headphones? All are made with comfort in mind.

In fact, comfort is almost as important to us as convenience. We shop at convenience stores, take the most convenient route to work, eat convenient frozen and fast foods, take the most convenient airline flights, and download music for convenience. Delivery people bring us pizzas, bookmarks save us navigation time on the computer, and paychecks are directly deposited to our accounts—all for the sake of convenience.

With all that comfort and convenience, you would think people would enjoy a surplus of free time, living a life of ease. But that's not how it works.

What is missing from a life of comfort and convenience is *effort*. Over time, people conditioned to comfort/convenience lose the capacity to sustain efforts. We can see this dynamic at work in our bodies, when we cease making physical efforts. In the absence of exercise, lifting even modest weights, jogging short distances, or climbing a small hill become daunting efforts. Ceasing physical activity does not bring greater well-being. Rather, people who stop exercising become increasingly unfit for even normal activity, suffering ever-greater aches, pains, and limitations.

The results of lives devoted to comfort and convenience can be viewed during retirement. For too many people, retirement is hardly the "golden year" experience. First they lose parenting roles; then they stop working. Filling days with vacations, golf, tennis, and trips to restaurants and movie theaters, they essentially retire from challenge. Comfort, in the retirement context, is often a codeword for the abandonment of goals and efforts. Eventually, like people who cease exercising, retirees find themselves unable to muster the energy to face normal life demands.

How much of getting old is simply the result of our decisions to cease using our bodies, to abandon our will, to retreat from all that is demanding? Ayn Rand noted the contradiction nicely when she observed that, in the Biblical story, man was cast from the paradise of Eden and condemned to a life of toil. How many of us long for Eden, only to discover that it is life's labors that bring us the greatest sense of fulfillment?

There's a certain kind of person that refuses to seek comfort: Nietzsche's warlike man who will turn on himself if there aren't external challenges at hand. If I cannot work on the market, I'll work on myself; if I can't reach a goal at work, I'll pursue a personal challenge. These are the people who exercise for the sheer joy of pushing one's body to the limits—and the pride that comes from expanding those limits. For such people, the path to follow is the one of least comfort. It is through directed efforts that we become more than we are.

Why these reflections on life and challenge? At the end of August, I will turn 50. My work at the medical school has been rewarding: I have headed a counseling program, taught in a variety of courses and programs, published a number of articles and books, and developed my interest in trading and trading psychology. My position at the school has always been secure, my finances are debt-free, and I have been blessed with a supportive group of friends and colleagues.

In other words, heading into my sixth decade of life, I am *comfortable*.

And that is the problem.

It's a problem I have faced before. During my sophomore year at Duke University, I knew I had to maintain an excellent grade point average to enter graduate school in clinical psychology. I also knew that my courses were not challenging me; that I could sustain mostly A's if I took the usual courses. In a fit of inspiration, I signed up for a graduate Comparative Literature course that required a working knowledge of two foreign languages. I had only a high school background in French. It was the most difficult, least comfortable course offering I could think of—and that's why I signed up.

After many long nights spent with assignments, bleary eyed from continual use of foreign language dictionaries, I received an A- from the instructor. From that time forward, no course ever intimidated me

So now, as at Duke, I find myself firmly in the comfort zone: a secure job, a paid-up home, a well-funded retirement. And, just as I did in college, I have decided to abandon that ease.

That is why, beginning in July, I am relocating with my family, starting roots in an entirely new community, and tackling some of the most demanding work imaginable. On July 12th, I will become a full-time psychologist working in a trading firm with some of the country's most successful traders.

That is when I start work as Director of Trader Development for Kingstree Trading, LLC in Chicago.

Out the window will go job security, the convenience of setting my own schedule, and the ease of work routines honed over two decades. Gone, too, is the security of issuing my ideas from the ivory tower. Instead, I will be forced to put those ideas to

work in the real world, with real traders, with real-time accountability for the results. I will learn more about trading and the psychology of traders than I ever imagined, and I will be pushed harder to tackle trading problems than I've ever been pushed.

You see, approaching age 50, I decided that Neil Young was right: it's better to burn out than it is to rust.

Along with athletics and the military, trading is one of the last fields of endeavor in which it is acceptable to be one of Nietzsche's warlike men (or women!). There is little room for alpha males/females in a world that values empowerment over power; teamwork over individual initiative; lifestyle over accomplishment. In athletics, the military, and trading, however, there is always room for the individual who strives for elite status. That status comes from rigorous training and discipline, neither of which are comfortable nor convenient. Perhaps those virtues are out of fashion, but they form the very fountainhead of human achievement. Show me a great creator or creation, and I will show you an individual who traveled the path of least comfort.

For those of you who cannot accept a life of rusting, I dedicate this article. Perhaps my example, at age 50, will come to you during moments when the struggle seems too arduous, the odds too great. You are never too old to begin life anew. It is never too late to find the true peace that comes from the satisfaction of waging a worthy war. May yours always be the path of least comfort!

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Shifts in the Market

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Note: The following is an excerpt from Gail Osten's interview with Brett Steenbarger in the March, 2003 issue of Stock, Futures, and Options (SFO) magazine entitled "The Windmills of Your Mind and the Pathway to Your Trades". The entire interview can be accessed at www.sfomag.com.

Brett Steenbarger: That's where being a psychologist is helpful to trading. It's because there is a large element of pattern recognition in both. The trader who's immersed in the market gets enough exposure to different patterns so that, over time, they can internalize those. It's very much the same working with a person in therapy. There are certain patterns that occur both for individual clients and across clients that an experienced therapist becomes very sensitive to. And, so, when I'm listening to a person talk in therapy, I'm picking up on small cues: shifts in their tone of voice, shifts in the topics that they're discussing, shifts in their posture—all of these are signals that have psychological meaning. There are patterns to those signals that are very important. The markets are similar. They give shifts. There are shifts that occur in trends. There are shifts that occur in indicators. Over time, you become very sensitive to those. Then the element of feel does become possible and important—particularly to very short-term trading.

Gail Osten: Can you give an example of a type of market shift you follow in your own trading?

Brett Steenbarger: Sure. I carefully monitor the Dow and NYSE TICK—the number of stocks moving higher or lower in their last trade. It is the most immediate measure of buying and selling pressure in the market. Sometimes the market is highly efficient, and the TICK moves subsequent prices a great deal. Other times, there can be significant buying or selling pressure and prices will barely budge. During the day, the market will make important shifts in efficiency: the degree to which the TICK measures are moving price. If you can identify the earliest phases of such shifts, you can ride some very nice intraday trends.

Fundamentals of Short-Term Trading: Part One

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Note: This was written 1/25/04 as the first in a series of articles that describe my evolving approach to short-term trading. I strongly recommend reading the article on stationarity, which is archived on the site, before reading this series of articles.

In this article, I will describe patterns of price behavior on an intraday basis and their implications for trading. I believe that an adequate consideration of how price changes actually occur during the day will challenge traditional methods of trading and open the door to new ways of viewing and analyzing the markets.

The Challenge of Stationarity

I'd like to begin this article with a set of descriptive data on the ES market, the main market that I trade. For purposes of convenience, I looked at the market between October 9th, 2003 and January 16th, 2004, which gave me 68 full days of data. I broke down each trading morning (9:30 ET – 12:00 ET) into half-hour segments to see how each segment compares to the ones around it.

Below is a table of the average range and standard deviation (in ES points) for each 30 minute period in the morning.

TIME	RANGE	ST. DEVIATION
9:30 – 10:00 ET	4.06	1.451
10:00 – 10:30 ET	3.765	1.452
10:30 – 11:00 ET	2.9	0.991
11:00 – 11:30 ET	2.458	0.806
11:30 – 12:00 ET	2.597	1.333

Now let's look at the average number of trades placed per minute during each half-hour period from 10/9/03 to 1/16/04:

TIME	TRADES	ST. DEVIATION
9:30 – 10:00 ET	187.88	98.91
10:00 – 10:30 ET	183.78	121.26
10:30 – 11:00 ET	133.20	91.97
11:00 – 11:30 ET	101.04	77.90
11:30 – 12:00 ET	84.60	84.24

Here's the average volume of trading in contracts per minute during each 30 minute morning period:

TIME	VOLUME	ST. DEVIATION
9:30 – 10:00 ET	2331	1470
10:00 – 10:30 ET	2133	1679
10:30 – 11:00 ET	1533	1310
11:00 – 11:30 ET	1121	1046
11:30 – 12:00 ET	932	1091

Finally, let's look at the average one minute level of the NYSE Composite TICK over each half-hour period in the morning from 10/9/03 through 1/16/04:

TIME	NYSE TICK	ST. DEVIATION
9:30 – 10:00 ET	300	378
10:00 – 10:30 ET	240	390
10:30 – 11:00 ET	212	311
11:00 – 11:30 ET	243	289
11:30 – 12:00 ET	295	272

What do these numbers tell us? Most traders are aware that there is more volatility and volume in morning trading versus the early afternoon, and more volume and volatility late in the day than in the middle. These half-hour figures, however, drawn solely from early day trading, suggest that even the morning hours are not uniform. Volume and volatility is highest in the first half hour and tends to wane through the morning, with particularly notable drops from 10:30 ET on.

This suggests that even the very short-term trader is going to run into problems of stationarity. When analyzing a market from hour to hour, we are—to a large extent—comparing apples and oranges. The time series of price changes from one period may not be drawn from the same distribution as the time series of price changes from the next or the one before it. This seriously compromises any technical analysis strategy (moving averages, oscillators, chart pattern analysis) that involves blending one period's trading with adjacent ones.

The lack of intraday stationarity also compromises quantitative efforts to model the markets, because we cannot use period one's data to predict period two if we have reason to believe that the two periods were not drawn from the same distribution of price changes. To use the analogy from my previous article on stationarity, if we count cards in blackjack while the dealer is drawing from a two deck shoe, our count will be invalid once the dealer switches to a four deck shoe.

The market, as dealer, is changing shoes every hour of the trading day. And this is a very big challenge to short-term trading.

Re-Visioning Market Analysis

Most traders, myself included, tend to view the market vertically. That is, if we build a spreadsheet, we array the recent data on top of the prior data and create all sorts of statistical manipulations that aggregate the data from bottom up. Vertical market analysis is problematic, however, in that it runs into the aforementioned challenge of stationarity.

When I created the tables above, I was looking at the market horizontally. Instead of putting each day's data on top of the previous values, I placed it to the right. That means that the rows of the spreadsheets represent common time periods—in the case of the data above where we looked at ranges, these were thirty-minute periods. Viewing data horizontally tells us some interesting things, in part because there is greater likelihood of stationarity across sixty common time periods than across sixty adjacent, different periods.

Let me give a concrete example. Suppose during a given five minute period of the day we see 800 ES trades being placed. Is that a meaningful volume or not? If the 800 trades occur during the opening half hour of trading, the volume is not significant. On the other hand, 800 trades in a five minute period that occurs between 11:30 – 12:00 ET would be close to the top 5% of all values for that period. The average volume in early morning is actually a mini buying or selling climax around noon. And, as we shall see later, this is an important piece of information.

Here's another example: Suppose we break out of a hour-long range and make a new high or new low on the ES. What are the odds of the move continuing in its breakout direction? If you aggregate all similar breakout moves through the day, you'll get a very fuzzy reading. About half the breakout moves will continue; half will reverse. But if you analyze the market horizontally, you'll find that breakouts behave differently early in the trading day than later on. There are many more false breakouts as you move on through the day. Why? On average, the reduced volume/volatility of those later hours makes it more difficult to power new market trends.

But wait! If the odds and extent of breakout moves is different from one hour to the next, then that means that chart patterns will vary from one period to the next. That also means that oscillator readings—what constitutes overbought and oversold—will similarly vary.

Here's something to try: If you want to analyze the market by chart patterns or indicator readings, switch your analysis from vertical to horizontal. Look only at similar time segments from a stationary lookback period in the market and see what the market has done when the patterns or readings have been similar to those observed currently. If you see a breakout from a two-hour range that occurs at 9:45 ET, look at all similar breakouts that have occurred in the first half-hour of trading. The chances are good that your findings will be less fuzzy—and may even reveal a tradable edge.

Equivalent Bars: Another Approach to Slaying the Stationarity Beast

Richard Arms once came up with an intriguing idea: He drew charts where the bars were defined by volume rather than time. Tick charts accomplish something similar. Each bar

represents X number of trades, not X units of time. The reason this is a promising concept is that volume and volatility are very highly correlated. If we draw our bars on a chart in such a way where they have equal volume, the odds are improved that we will have a stationary intraday distribution as we move from one bar to the next. This would improve our vertical analyses of the markets. For instance, if we wanted to use a 14 period RSI to define overbought and oversold levels, we would be on firmer ground if each of the fourteen periods were relatively uniform and drawn from the same distribution of values.

If we take the data from the tables above, we might think about making each bar equal approximately 2000 contracts of volume. That would, on average, give us one bar for each of the first two half-hours for the day; then one bar for each 45-minute period later in the morning; and one bar for each hour around midday. Making this segmentation of the day standard (where we always equate, say, the first half-hour of trading with the full noon hour) is a quicker and dirtier solution than Arms', but it does have advantages as well. When you draw bars that are supposed to be equivalent in volume and volatility and *then* you see an unusually large or small bar, it is much easier to visually identify the significance of the breakout or consolidation.

Making the bars equivalent also affects the holding period of a trade. Instead of holding a trade for X hours—where morning hours will expose you to much more volatility than midday hours—you would hold the trade for X bars. Each trade would be more similar to others, which is helpful for risk control.

Most important of all, however, is that you could have greater confidence that the chart patterns and indicator readings that emerge on a uniform bar chart will be more reliable than those that show up on a standard chart. A breakout of certain size from bar 1 to bar 2 will be more likely to have the same meaning early in the day as later, since you are adjusting the time value of the bars.

My basic trading is intraday, but when I hold a position for swing periods, I use the equivalent bars to help me time the trade. A future article will detail this swing trading and how it addresses stationarity concerns.

<u>Scalping: Still Another Response to Nonstationarity</u>

In many ways, scalping is the opposite of creating equivalent bars. The scalper holds a trade for a very short period of time—so short that the next bars are likely to be drawn from the same distribution as the previous ones. Scalping reduces the average size of gains and losses per trade and runs the very significant risk of overtrading and allowing commissions and slippage to eat away at equity. If, however, the scalper can find reliable patterns for trading, this can be the tortoise's response to the swing-trader's hare.

Scalping can be anything as short as trading the next tick if you're on the floor to holding a trade for multiple minutes. I define scalping pragmatically as exiting a position within a time frame after which you normally expect the distribution of price changes to shift.

Thus, a scalp might be held for under 30 minutes early in the day, but could be held for over an hour around midday. To use the above idea of equivalent bars, a scalp is a position held within one of those bars.

Given this definition, most of my trading is scalping. Here's an example: A market drops on high volume at 11:00 ET, with the NYSE Composite TICK hitting –750. Despite this drop, the market makes only a marginal new low for the day before rebounding smartly as the TICK moves to zero. As the market pulls back lazily on only modestly negative TICK, I might enter that trade on the long side to take advantage of the failed downside breakout. The recent low—and the –750 TICK level—serve as logical stops. On the first surge in upside volume and NYSE TICK, suggesting that the shorts are panicking to cover their positions, I might exit the position and take a few quick points of profit—particularly if it appears the larger time frame trend is down.

Note that a key to this trading is the horizontal analysis of the market. I know that the volume is high on the downside breakout attempt, because I know the exact distribution of volume for the 11:00 hour. I also know that the TICK reading is extreme for that hour based on an analysis of distribution. The horizontal analyses allow me to objectively define a buying or selling panic. I am buying a panic where the market shows underlying strength; selling a panic where there is weakness. Because the trade takes place within a half hour period, I need not be overly concerned about shifting distributions of price changes. I can use standard one-minute charts and indicators without the need for equivalence adjustment.

Summary

In a future article, I will elaborate both the scalping and swing trading strategies that I am developing. I will also be following the results of trading on my site's weblog. My hope is that this article stimulates your thinking about markets and market analyses, making you question off-the-shelf modes of analysis and encouraging you to create your own. Designing the methods of trading that best fit your lifestyle and personality is half the trading psychology battle. I will have more on that topic in the next article in this series.

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Fundamentals of Short-Term Trading: Part Two

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Note: This was written 1/31/04 as the second in a series of articles that describe my evolving approach to short-term trading. I strongly recommend reading the article on stationarity, which is archived on the site, before reading this series of articles.

The first article in this series looked at intraday patterns of volume and implications for trading. A major conclusion was that the distribution of price changes through the day is nonstationary, making it hazardous to employ the same buying and selling parameters through the day. By analyzing markets horizontally as well as vertically—comparing action at one time of day to action at the same time during previous days—we can generally gauge whether or not a particular movement is significant.

How one employs this information will depend upon his or her time frame of trading, which in turn reflects one's risk tolerance, which is closely related to personality traits. Longer holding periods yield more variable results—including drawdowns. Adjusting the mix of holding period and position size is essential in ensuring that one is taking a level of risk that will produce adequate rewards, but that will not court ruin during a losing streak. The management of risk is an oft-neglected facet of trading psychology.

Risk, Size, and Holding Period

Let us say, for instance, that we are going to risk 2% of our trading capital on a trade. If we are trading tick-by-tick, we could trade dozens of contracts and still remain risk-prudent. If, however, we are holding positions overnight, where the odds of a multipoint move are now greatly increased, the same 2% parameter would yield a position size of only a few contracts. Even on an intraday basis, a scalping trade placed early in morning has a greater risk of a multi-tick adverse move than the same trade placed nearer to midday. Keeping size constant during periods of nonstationarity—or worse yet, increasing size when you see volatility ramping up—courts the scenario in which a single losing trade undoes several previous winners.

A fixed-fractional trading strategy defines the number of contracts you can trade for a defined level of risk. Michael Bryant, in his article "Position Sizing With Monte Carlo Simulation" (Technical Analysis of Stocks and Commodities; Feb. 2001), shows how simulations of trading outcomes with particular strategies can help one define the fraction of trade capital to place in a trade while keeping the risk of severe drawdown under 5%. Simulations using his MiniMax swing trading system, for example, show that trading 2% of capital produces a maximum peak to valley drawdown of 24% on the ES futures with 95% confidence. If one wanted to reduce that drawdown to 12% of capital with the same level of confidence, one would risk only 1% of capital.

The fixed-fractional strategy described by Bryant is drawn from the following equation, where N = the number of contracts traded; ff = the percentage of trading capital allocated to the trade; E = total trading equity prior to placing the trade; and R = the risk of the next trade in dollars (which is your stop).

$$N = ff * E/R$$

Thus, if I am willing to risk 2% of my $100,000 trading account on a trade where my stop is set at 4 points ($200 per contract), I could trade 10 contracts and still remain risk-prudent. If I am a scalper and my stop is much smaller, I can trade a larger number of contracts with equivalent risk. If I am a swing trader willing to set a double-digit point stop, I will trade smaller size.

Adjusting Risk and Reward

This brings us back to the topic of stationarity. In the above example, I have set my stop at 4 points. The odds of a four-point setback, however, are not the same early in morning trading as in midday or late in the day. If I am an intraday trader and rely on a fixed-point stop, I no longer am managing risk consistently. I may be taking too much risk at one time of day and too little at others. I need Monte Carlo simulations on a horizontal basis to tell me the 95% probability of a defined market drawdown for morning trades, afternoon trades, etc. Just as I would not trade similar size on an intraday vs. swing basis, I would not trade identical size at various times of day.

It is difficult to square this position with the reality that very successful traders tend to increase their size in direct proportion to their confidence in a trade. A consistent theme among "Wizard" traders is that, once they identify a move, they exploit it for all its worth. The less-successful trader is apt to become risk-averse in the face of a profitable position and exit early. Since volatility is commonly increasing as a trade is working out, adding to positions is significantly adding to risk. A reversal at the end of a move, when size is greatest, could eliminate all profits, even if one has been correct in anticipating the direction of the move.

Scaling into positions over time can address this challenge. In a forthcoming book on Trend Following by Michael Covel, he quotes Ed Seyoka's approach to pyramiding. The instructions for pyramiding, Seykota explains, are depicted on every dollar bill: add smaller and smaller units, while keeping your eye open at the top. The advantage of scaling into one's maximum position is that it keeps risk lowest early in the trade, when its outcome is most in question. As the trade works out, adding to the position allows the trader to maximize profits. The successful trader is thus thinking like a Bayesian, watching the unfolding of a trade to see if the market is gaining or losing strength, and adjusting the position accordingly.

Conclusion

Short-term trading, like any trading, boils down to mathematics. If you have a roughly equal number of winning and losing trades, the average size of the winners will have to meaningfully exceed the average size of the losers in order to assure profitability. When traders do not properly adjust trading size and holding period, they can have a good trading methodology, but a red P&L. The average size of their losers will swamp the winners.

A good self-assessment is to measure the amount of time and energy that you spend defining market entries, gauging exits, determining trade size, and managing trades by scaling in and out. Most traders place great emphasis on entries, are too impulsive on exits, and give little thought to the definition and adjustment of trade size. Money management, and not simply "Buy when the RSI hits 30", separates successful traders from less profitable ones. Very often, a trader's emotionality during a trade stands in the way of good trade management. I will have more on that next week.

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Stationarity: The Best-Kept Secret in Trading Success

Brett N. Steenbarger, Ph.D.

www.brettsteenbarger.com

Note: The following article was written on 12/28/03 specifically for the Trading Psychology website. I believe the concepts in the article help to explain why 90% of the material written for traders and/or presented in workshops is invalid.

Every trader is familiar with what Victor Niederhoffer calls the "ever-changing cycles" within the market. Just as a pattern makes itself evident in the market, the pattern shifts to a new configuration. For example, the market may trade for a while within a range, offering nice buy and sell signals with a 14 period RSI. Then, abruptly, the market will break out and an overbought RSI will stay overbought or oversold for a prolonged period as the market makes a trending move.

It is because of these ever-changing cycles that traditional tools of technical analysis cannot be successfully applied in a purely mechanical fashion. The website Barchart.com has a nice feature where they track trading signals from such standard tools as moving averages. Over time, it is clear from their tracking that the signals do not perform better than random chance. For a while the signals will prove profitable, only to degrade once the cycles change.

It is ironic that traders spend considerable time researching better indicators and models while giving little thought to the time frame over which these trading tools might be valid. If, indeed, the market consists of ever-changing cycles, then any system or indicator is apt to degrade in its performance over time. In fact, if one waits for an indicator or system to develop a fine historical track record, the odds are good that their useful life are limited.

What can a trader do in the face of such uncertainty?

Stationarity

The statistician's term for ever-changing cycles is stationarity. A number series is stationary if the process that generated the series has been constant. Clifford Sherry, in his excellent text The Mathematics of Technical Analysis explains, "A stationary time series is one in which the underlying *rules* that generate the time series do not change over time." (p. 9).

My favorite example is the Las Vegas casino. Let's say that you are playing blackjack and think that you have a superior card-counting strategy that will help you make money. By counting the number of picture cards vs. other cards that have been

dealt, you can assess the probability of drawing a picture card on subsequent hands, tilting odds in your favor.

Such a strategy will work as long as the number of decks employed by the dealer is constant. If, however, the dealer intermittently and secretly changes the number of decks in the shoe, the card counting strategy would be imperiled. If the gambler assumed that twelve cards worth 10 or higher were left in the deck because eight had been dealt, the assumption would be faulty if two decks instead of one were being used. By changing the rules for dealing cards, the dealer creates a distribution that is nonstationary.

Clifford Sherry notes the importance of nonstationarity for traders: "If you use these methods and techniques and find that your time series is nonstationary, it is probably best to stop and think carefully about your investment strategy. Nonstationarity implies that the underlying rules that 'generated' your time series change from time to time without warning. Therefore, you are dealing with maximum uncertainty about the potential outcome of your investment." (p. 6). Sherry's phrase "from time to time" is important. If, say, the card dealer changed the number of decks in the shoe after each and every hand, no card counting strategy would be possible. What makes counting viable is that the cycles are changing, but not constantly changing. A regime—a period in which the market follows a stable set of rules—can last for a while, allowing an alert trader to profit while it is in force.

What should be clear is that a skill essential to trading success is early identification of regime change: those occasions when the cycles are shifting and the distributions of price changes are significantly varying from their recent norms. If a card counter can quickly identify when the number of decks in the shoe have changed, he can avoid betting his old system and take the time to develop a new one. Similarly, once a trader notes that market behavior has shifted, he or she can stand back and identify the new rules that the market is following and position themselves for the new regime.

Amazingly, very few traders bother to look for stationarity and even fewer shift their trading strategies according to the characteristics of recent price change series. This includes technical analysts who employ the same indicators and indicator values across all markets and quantitative traders who fail to properly adjust their lookback periods when testing a relationship between predictors and price change. Would we expect the time series from 2000 to 2002 to provide an accurate database for gauging relationships in the 2003 market? Did the market from 1998 to 2000 provide useful guides over the subsequent two years?

Assuming stationarity when it is not there is one of the cardinal errors of trading. If you are trading a pattern that has been valid in the past and you don't know if the current distribution of price changes match those from the past, you are flying blind. Successful trading requires that you identify the rules the market is following and base your strategy on those.

Fundamental Uncertainty in Trading

Let's go back to that last sentence. The trader knows that there are ever-changing cycles, but makes a fundamental assumption. That assumption is that the regime that is in place will not change over the next trading interval. The trader assumes that the market's rules will continue to be in force at least one more time. Without that assumption, the trader is either assuming randomness or is assuming regime change in the absence of concrete evidence of such. The only way we know if a regime has changed is by seeing an actual shift in the distribution of price changes. That means that there is a fundamental uncertainty in trading. The next trade may be the one in which the cycles shift. We cannot know for sure. Any trading strategy needs sound money management for this reason. Betting the house on a single trade—or during a single time frame—is courting ruin.

This has some interesting implications. For example, a well-researched trade that loses money may be an important source of trading information. If I have tested a historical period and found stationarity and then test a relationship between predictors and prospective price change over that period, my trade should have a high probability of success—***if*** the market is remaining stationary. A losing streak with well-researched trades is often a sign that the markets are changing. Standing aside, waiting for evidence of the new regime, and remodeling the market over the more recent time frame corresponding to the new regime may allow the trader to learn from losses—and recoup them as well!

The fundamental uncertainty of trading is highest in daytrading the stock market—particularly index futures such as the SP/ES and ND/NQ. This is because markets are nonstationary on an intraday basis—almost without fail. Markets are most volatile early in the day's trading, retreat to lowest volatility in early afternoon, and then pick up volatility toward the close (only to plunge in volatility during Globex trading). It is rare indeed that the distribution of price changes from 09:30 – 11:30 AM ET will match those of 11:30 AM – 13:30 PM ET. Using the same indicators and indicator values in morning trading as in early afternoon and Globex sessions is a sure road to the poorhouse. Conversely, identifying regime change and valid relationships with each intraday regime shift requires a nimbleness—and an ability to control losses—that most traders lack.

Interestingly, markets exhibit greater stationarity from day to day and week to week than from hour to hour. That is one of the factors that has sped my transition from intraday trading to swing trading. But if stationarity is as important to trading as Sherry and I believe it to be, then it makes little sense to pigeonhole oneself as a short-term trader, a long-term trader, a daytrader, etc. One should trade the time frames that offer the greatest stationarity. If the market is stationary over a period of weeks and if you can clearly identify the rules the market is following over that period, it makes sense to trade those rules. Later, the market may exhibit stationarity over a shorter time frame, covering a series of days. The rules that capture that regime will provide the basis for trading.

Many times, we hear of the distinction between mechanical and discretionary trading. This is a false dichotomy, because both mechanical and discretionary trading often fail to take ever-changing cycles into account. The real alternative to mechanical trading is flexible trading that searches for regimes and the rules guiding regimes, exploiting these in a rule-governed manner.

From Theory to Practice

Analyzing the market for trades should begin with tests for stationarity. In my new swing trading system, I begin my analysis by identifying the longest swing period in which the markets are exhibiting a stationary series of price changes. (There may be more than one such stationary swing period, permitting diversification of trading by time frame, and—of course—there may be stationarity for certain instruments and not others, permitting diversification by trading vehicles.) My procedure for assessing stationarity is to divide the time series into halves and statistically test to see if the means and standard deviations for the halves are equivalent. For readers interested in the math involved, Sherry's book outlines a practical procedure for testing stationarity. The math is simple; I employ a quick-and-dirty t-test to the data and conduct the test entirely within Excel. What takes time is the repetitive testing of various lookback periods to find the proper window of stationarity.

Once I have that window, I then analyze the market qualitatively. I look at my indicators and observe how they have behaved during the stationary lookback period. The indicators that have consistently traced swing highs and lows over that period are the ones I will use to plan my next trade. I test signals yielded by the indicators (individually and in concert) over the lookback period to examine their entries, exits, and drawdowns. When I have a cadre of indicators that have performed well over the lookback period, I rely on them for my next trade.

But that's curve-fitting, you might protest. Isn't it dangerous to overfit the data with an optimized model?

My response is that optimization is only a problem when you fail to take stationarity into account. If you know you are trading within a stable regime, it makes sense to do your best to capture the rules the market is following over that period. My swing trading methodology might best be described as serial optimization: continually hunting for periods of stationary market behavior and trading optimized models derived from those periods.

Now here's the rub. When markets shift regimes, the window for the new regime is small. In testing the indicators that best follow the new, emerging rules, there aren't enough instances to properly conduct statistical tests. That is where historical tests become important. By identifying past periods of market history where the markets were following the same rules as today, we can see if the indicators and signals that work in the recent lookback period also worked back then. The crucial assumption is that markets that exhibit stationarity and equivalent means and standard deviations in price

changes are following the same rules—regardless of whether those markets were taking place in 2003, 1993, or 1983. If the strategy that we've optimized in the recent, stationary market window also produces profitable trading signals during past, similar regimes, we increase our confidence in the strategy and, indeed, can even test its signals statistically to ensure their departure from randomness.

Perhaps this is why we see so few traders incorporating stationarity into their analyses: It is time-consuming to assess market windows, operative trading rules, and test strategies for exploiting those rules. It is easier—and far more beguiling—to assume that a single system or indicator will produce consistent profits. More than one person has encouraged me to make my writing, research, and trading strategies less complex so that they can be more readily understood and accepted by the bulk of traders who attend seminars, buy trading books, and hire gurus for advice. One seminar organizer even fretted that I might be a threat to the self-esteem of traders, because the majority of traders lack the data and/or statistical background to conduct my kind of trading. I took that, of course, as quite a compliment.

Afterword

If you read the Trading Psychology Weblog with any frequency, you'll notice that many of the charts that I post have a common—and seemingly random—starting date. For instance, as I write this (12/28/03), many of my charts begin with 8/1/03. This is not an accident. The period from August through December represents one of those stationary windows from which we can extract useful swing trading strategies. By posting charts over stationary time frames in the market, the Weblog can assist you in identifying tradable market patterns.

Incorporating stationarity into your market thinking and trading opens the door to innovative trading approaches. For instance, within a longer stationary window (several months), you might identify a smaller window (the past several days) for a short-term trade. By nesting and aligning the short-term trade within a longer-term pattern, you can formulate some high probability trades. Beginning January, 2004, I will be posting real time swing trades to the Weblog that take advantage of rules derived over one or more stationary windows.

Yet another avenue for research is the use of very short-term nonstationarities to identify points of larger regime change. A while ago, when I was exclusively trading the SP on an intraday basis, I noticed how short-term shifts in the NYSE Composite TICK tended to occur at points of trend change in the market. The short-term nonstationarity was a marker for longer-term trend change. I believe the same occurs at all time frames. By monitoring shifts in short-term patterns and indicators, we may be able to hop aboard early phases of regime change.

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the stock index futures markets. He is the author of The Psychology of Trading (Wiley, 2003) and coeditor of the forthcoming The Art and Science of the Brief Psychotherapies (American Psychiatric Press, 2004). Many of his articles on trading psychology and daily trading strategies are archived at his website, www.brettsteenbarger.com.

Trading Psychology Weblog Swing Trading Methodology

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Note: This article was written on 1/4/04 and summarizes the use of the Weblog measures in a swing trading methodology.

When I developed my short-term (intraday) trading methodology, I anchored it in a measure of trend tendency (trendiness) that I called the Power Measure. In my historical tests, I noticed that the Power Measure hovered near zero during periods of market consolidation and abruptly rose or declined during breakouts from consolidation ranges. Simplifying markets by categorizing them as either uptrending, downtrending, or consolidating, I was able to formulate trading guidelines for each market mode. In uptrending markets, I bought pullbacks that remained above regions of well-defined institutional selling; in downtrending markets, I sold rallies that failed to surmount regions of well-defined institutional buying. In consolidation range trading, I used a real-time measure of the number of stocks making new highs and new lows to either validate candidate breakouts (and trade them) or invalidate the breakouts (and fade them).

When developing a swing methodology, such categorization of markets—and development of separate strategies for trading each category—was once again my aim.

The challenge that arose is that the variables that drive the market over an intermediate-term trading time frame (weeks to months) are different from those that move the market intraday. In a sense, intraday trading is easier. Once you can figure out trend, momentum, and institutional activity, you can wait for all three to move your way and then just climb on board. The real problem with intraday trading is overtrading. If you start trading when those three variables aren't moving in the direction of the trade, the combination of the lower winning percentage and the higher transaction costs takes its toll over time.

On an intermediate time frame, trend, momentum, and institutional activity are most certainly important. Equally important, however, are three other variables:

- ***Stationarity*** – I've written a recent article on this topic, and it is must reading for understanding the swing trading system that I am implementing. With intraday trading, I solved the stationarity problem by trading a narrow time frame measured in minutes. If the trade did not go my way in a very short time span, I exited. Because markets tend to be stationary from minute to minute, but not from hour to hour, I could generally rest assured that the relationships that got me into the trade would persist over the very short run. The price I paid for this relative certainty was a small average profit per trade. In the new swing system,

there are no fixed trading signals. This is very important. The system begins by identifying one or more stationary regions within the market. Those regions could span months, weeks, or days. Once a region is found that meets the criterion of stationarity, I then apply the tools of trend, momentum, and institutional activity to capture the underlying "rules" that are generating the stationary time series. Those rules provide the trading signals. For instance, if a given level of Institutional Selling is associated with market lows during the stationary period, I will be on the alert for buying the next time we hit that level of selling. Below I describe this in greater detail.

- ***Monetary Conditions*** – This is one of my top priority research projects for 2004. Interest rate conditions are a potent predictor of market behavior over longer time frames. I am in the process of developing and testing a Monetary Composite which describes the trend of short- and long-term rates. The idea is to use this Composite as a filter for trades and/or asset allocation per trade. For instance, I would be more aggressive in entering a long trade and/or increasing my bet size for a long trade if the Monetary Composite was bullish (interest rates declining or stable) than if the Composite was bearish.

- ***Timing*** – Long-time readers of the Trading Psychology Weblog might recall an indicator that I developed called ETA (Estimated Time of Arrival). This unusual measure sprang from research that suggested that the characteristics of the previous market "cycle" (defined as a movement from a relative low to a relative high and back to a relative low) were related to the timing of the current cycle. Thus, one could estimate the timing of the next market high or low based upon measures of duration, momentum, and amplitude of previous cycles. I experienced dramatic successes with ETA, but many failed signals as well. The measure definitely worked better over longer time frames than intraday, where it was essentially worthless. So I dropped it when my trading became very short term. I have returned to ETA as my second priority research project for 2004, because I believe I can salvage some worth from it. Specifically, I think the measure failed because I was applying it over time frames that were not stationary. My hypothesis is that limiting ETA-based trades to cycles that span stationary time series will yield superior returns.

The first iteration of the Swing Trading System will simply focus on using the traditional Weblog parameters (trend, institutional activity, momentum) over stationary time frames to develop trading signals. Future versions will integrate any findings from the Monetary and Timing research. Whether that research will yield entirely separate trading models or refined versions of a single system, I cannot yet determine.

Once a stationary swing trading time frame is identified—and once it is determined that this time frame offers sufficient volatility for profitable swing trading—Version 1.0 of the Swing Trading System begins with alerts. There are separate alerts for trend, momentum, and institutional activity. An alert occurs when one or more

measures of trend/momentum/institutional activity reach levels that have been associated with tradable market tops or bottoms over the stationary period that has been identified. Once there are alerts across the three domains (trend, momentum, institutional activity) for a market top, no buying may be initiated and vice versa. Alerts across the domains also aid in the definition of exit points for trades. For instance, one may take partial profits from a long position once alerts for a market top have been triggered.

Alerts are not entry signals; they are preconditions that must be met prior to entries. Once the alerts are sounded, we turn our attention to the old, trusty intraday measures of trend, momentum, and institutional activity. If we are alerted to a market top, we short the market once such measures as the Power Measure, the DSI, and the Institutional Composite turn bearish. In other words, we don't try to pick a top in the market. We wait for the trend to begin its move in our direction before entering the trade. The same is true for long entries. If we are alerted to a market bottom, we enter once the short-term trend, momentum, and institutional measures turn bullish.

This methodology greatly aids in the definition of exits. If the alerts are valid and the uptrend has truly reversed for a short trade, we should not rise to new highs in the trend, momentum, or institutional measures that framed the trade. We should also not move to new price highs that expand the number of stocks registering fresh short-term highs. Any such developments would cause us to exit the short trade. The same is true for long trades. If the trend/momentum/institutional measures that gave us the alerts move even lower after an entry, we exit the trade. Similarly, if we get fresh price lows and an expansion in the number of stocks that register fresh new lows, we bail.

Why choose these as exits? Because they provide potential evidence that the market is no longer behaving in a stationary fashion. If the indicator levels that defined previous tops and bottoms in the market are no longer containing market rises or declines, the rules in the market may be changing under our feet. We can no longer have confidence in the trade if stationarity cannot be assumed.

As for profit targets, these also follow from the market rules that have been defined over the stationary period. We take profits on the long side once we have alerts that identify a market top region, and we take short profits once we have alerts that identify a market bottom region. It is possible to hold positions during the alert period and exit only once the measures have turned against the position (creating a system that will frequently stop and reverse), but my current leaning is to not be a piggy and take profits once the alerts are sounded.

For those who may be following the Weblog, I hasten to add that this is very much a work in progress and that any signals generated from the developing model should not be taken as trade recommendations. Only each individual trader can define his/her tolerance for risk and decide when and what to trade. I will use the Weblog to report my own trades and the evolution of the Swing Trading System, but please

recognize that it is a diary—not an advisory service. At best, it can provide a model for your own system development and some ideas about what to include in such a system. The real work of fitting a system to your personality and trading style, internalizing its behavior, and developing confidence in its signals must be undertaken by each trader independently.

Tacit Knowledge and Trading

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Note: The following is an excerpt from Nancy Einhart's interview with Brett Steenbarger in"The Art of the Brilliant Hunch"; Business 2.0 magazine; November, 2002.

Traders are like batters facing a 95-mph fastball. If they take time to weigh their decisions, it's too late. Traders work on pattern recognition, but the very short-term trader has to internalize these patterns implicitly. What traders can do to accelerate their learning is increase the intensity of their practice sessions, as an athlete would. Maybe practice trading in more than one market of simulate a whole day's worth of trading in 15 minutes. Under conditions of high focus and concentration, after looking at pattern after pattern, decision-making becomes second nature.

The Challenge of Changing Yourself

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The following is an excerpt from The Psychology of Trading (Wiley, 2003).

The intensity and the repetition of change efforts are directly responsible for their ultimate success. The new, constructive patterns that are likely to stick are the ones that have become associated with highly distinctive states of mind and that have been overlearned. Conditioning new patterns to a distinctive state of mind makes it easier to summon those patterns any time you reenter that state. This connection becomes internalized most readily when it has been rehearsed intensively. It is rare that insight alone will create change; more often, *doing* things differently allows you to make the change part of your ongoing repertoire. The greatest challenge to changing yourself as a trader is also the greatest challenge to change in therapy. It is relatively easy to initiate change, but it is far more difficult to sustain it. Without consolidation, people are likely to relapse into their habit patterns. An essential ingredient in change is to repeat a desired pattern again and again in the same way, at the same time, in the same situations on every occasion that presents itself. At first, enacting the new behaviors will require conscious effort. With repetition, however, the behavior becomes automatic, an internalized part of the self.

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The Dream

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It was only a brief dream, but it kept me fading in and out of sleep for quite a while during the night.

I dreamt that I was looking at bars on a stock chart. They looked a bit like candlestick bars, but were shaded in colorful ways. The colors were different on the top and bottom of each bar, and the shading was subtly different within each color field. It struck me that the bars were actually Rothko paintings depicting stock price movement.

I had the strongest sense that the shading within the bars was the key to understanding future price movement.

I also recalled Rothko's insistence that his paintings were not about experiences, but *were* experiences. I knew that Rothko would want me displaying the charts large and at eye level, to immerse myself in the color fields.

When I woke, I felt that I had dreamt something significant. One of my first waking thoughts was that there was a similarity between Rothko's work and Philip Glass' music—something I hadn't contemplated before.

The Mindset of the Successful Trader

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Note: The following is an excerpt from Gail Osten's interview with Brett Steenbarger in the March, 2003 issue of Stock, Futures, and Options (SFO) magazine entitled "The Windmills of Your Mind and the Pathway to Your Trades". The entire interview can be accessed at www.sfomag.com.

Gail Osten: Talk to me about how traders can advance their trading by focusing on what they are doing right. It seems that most traders are looking at what they're doing wrong. Perhaps you can also touch on journaling a bit.

Brett Steenbarger: The idea of solution-focused therapy is that you examine what you're doing when you are moving toward your goals. When you are achieving your goals, what are you doing? What is working for you? You want to identify that so you can do more of it—so you can keep doing what works for you. And I think that principle applies to trading—that you can learn quite a bit from your most successful trades. In the audit that I referred to a while ago—by monitoring times of day when I placed those trades, the average holding period of those trades, the average size of the positions—it really gave me a sense of what kind of trading was working for me and what kind wasn't. A big transition for me, personally, and I think for other traders, came when I stopped beating myself up for unprofitable trades and took more of an attitude that losses are a cost of doing business. I focused on the right trading behaviors and doing more of what works.

Gail Osten: Well, that's like any entrepreneurial venture. Implicit in the cost of doing business is that you can only allocate so much to those losses.

Brett Steenbarger: Yes. There's a mindset, I think, that helps. If you're a basketball player, even if you're good, you're going to miss half your shots. And when you're a baseball player, even when you're good, you're going to make an out more times than you get a hit or get on base by a walk. And so, you learn to accept that and not take it as a failure. The idea is to get a good cut at the ball. Take a high percentage shot and, over time, the odds will work for you. I think the same principle works in trading. And so if you aren't beating yourself up and if you're focused on continually doing the right things, you have a much better chance of the odds working in your favor in trading.

The Morality of Trading

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The following article was originally posted to the Spec List in July, 2005 and was subsequently posted on the excellent site hosted by Victor Niederhoffer and Laurel Kenner: www.dailyspeculations.com.

I recently made the decision to step down to a part-time role at my trading firm to make time for the writing of my next book. One of the traders I had worked with graciously treated me to dinner to celebrate my year at Kingstree. This trader personally accounts for several percent of the daily trading volume in the Merc's ES contract and has made millions of dollars (after all expenses) during each of the past several years.
Over dinner, he made an interesting statement. He indicated that he was proud of his trading success, but was looking for more. "I don't produce anything," he explained. Others like me, he said, produced books or provided beneficial services. All he created, he felt, were profits.

My philosophical hair began to crawl when he said this; his statement suggested that he had unconsciously accepted an altruistic standard of ethics. One's value, such a standard implies, is measured by his or her "contribution to society". By that standard, we should admire a philanthropist-heir, who distributes the money he never earned, more than Robinson Crusoe, who—by his intelligence and creativity—thrives on a remote island. I've heard this standard espoused in other ways by traders who justify their activity by claiming that they contribute to liquidity in the marketplace—once again seeking a sanction in the good provided to others.

Now here's what's interesting: Despite my trader's evident angst, he had no intention whatsoever of giving up trading. Indeed, he indicated that trading alone gave him the sense of meaningful activity that he hadn't found since his days as a boyhood athlete. This, I'm sure our Federal Reserve chair would say, is a conundrum. Here he tells me that trading produces nothing of transcendent worth, and yet he finds it supremely meaningful. Why would someone find an empty activity meaningful?

Thomas Kuhn, the historian of science, offers a key insight in his book *The Essential Tension*:

> *When reading the works of an important thinker, look first for the apparent absurdities in the text and ask yourself how a sensible person could have written them. When you find an answer…when those passages make sense, then you may find that more central passages, ones you previously thought you understood, have changed their meaning*. (p. xii).

Kuhn's observation is closely akin to Ayn Rand's dictum that contradictions do not occur in nature. If you find a contradiction, check your premises; you'll inevitably find that one of them is wrong. When an important thinker writes something absurd, the chances are good that the absurdity is a function of the reader's frame of reference. Upon checking the premises of that frame of reference, you may discover meanings in the writer's work that, to that point, had been unappreciated.

A psychologist's restatement of this idea is that, when sane people say or do things that make no sense, the odds are good that their sense is different from yours. A while back I met a bemused foreign exchange student from Iceland who could not understand why Americans ask, "How are you?" and then don't stick around for a reply. Clearly the meaning of what he heard was not the meaning intended.

So it is, I believe, with our successful trader. His doubts about his productivity reveal an altruistic standard of ethics. His actions, however, driving him to continue to trade well after his financial need for income has been met, suggest that another standard of ethics is lurking in the background.

Here again we turn to Miss Rand and her published journals:

> *An animal cannot act against his instinct nor suspend it. He enjoys a safety man can never have—the invariable operation of his means of survival…A flea does not have the responsibility of remaining a flea. It can be nothing else…Man must remain man through his own choice. Nature guarantees him nothing, not even his own nature. Such is the penalty and the honor of being a rational creature* (p. 254).

Later, she emphasizes:

> *The first, most earnest, most crucial question man asks of himself is: Am I right? An animal cannot conceive of such a question. Man cannot escape it. In one form or another, it rings through his whole life. It sets the leitmotif of his existence—the style of his soul* (p. 254).

Happiness (as opposed to pleasure), I would argue, derives from the experienced sense of answering Rand's question in the affirmative. Happiness is experiencing oneself as *being right.* Each of our activities—relationships, productive work, athletic achievement, art—is a potential mirror in which we experience ourselves. These mirrors either affirm for us that we are right or reflect an image that is cloudy or negative.

The ability to derive pleasure from action that affirms our right-ness as rational beings is evolutionarily adaptive. If we consistently experienced happiness by being wrong—by acting in a manner contrary to the needs of our survival—we would not be long for this earth. To the degree that we are hard-wired to respond to affirming mirrors in a positive way (a baby's response to a mother's smile; a child's satisfaction in mastering a new skill; our joy in finding love), we operate with a biologically-based, implicit set of ethics that may well contradict those that we've learned over the years.

So it is with our trader. He knows damned well—and shows it in his actions—that he is producing something more than profitable trades. *He is producing the sense of rightness that powers his soul.* The fact that he also contributes to liquidity, provides for the material comfort of his family, utilizes his wealth to invest and create jobs—all of this is secondary: a happy consequence of his acting upon his happiness. What is important is that *to be happy is to be ethical*, because true happiness derives from action in support of life itself. An unhappy person is not necessarily evil—life's circumstances, from slavery to depression, can rob one of the options needed to "be right"—but to be consistently and radiantly happy requires a will directed toward values. The markets tell us each day if we are right or if we are wrong. Each day we, as traders, can live as human beings—armed only with our rational faculties—or abdicate that penalty and honor.

Success and happiness—the conditions needed to thrive on this earth—are reflections of the choices we make. What greater productivity can there be? What greater good?

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The Three Vices of Trading

Brett N. Steenbarger, Ph.D.

The following is a short article for Woodie's CCI traders. It summarizes several of the psychological pitfalls that interfere with accurate pattern recognition. My hope is that CCI traders can focus on these three "vices" as mental preparation prior to entering the markets. One of the best ways of becoming an observer to your negative behavioral patterns—rather than a trader lost in those patterns—is to periodically take your emotional temperature. That means standing back and asking yourself: Am I falling prey to one of the vices below? Remember, observing and interrupting your patterns are the first steps in altering them! Your patterns lose control over you as you become better at not identifying with them. When you become an observer to your patterns, you are separating yourself from them. What great progress that is!

Vice Number One: PERFECTIONISM

Perfectionism is often the chief culprit when the pain of losing exceeds the pleasure of winning. Desperately trying to feel good about themselves, perfectionists set unrealistically high ideals. They think they will finally be OK if they just accomplish X. (For X, you could substitute many things, including looks, wealth, popularity, or achievement). Because X is an unattainable goal, perfectionists ironically use their ideals as a basis for self-criticism when their performance doesn't match up. After all, is achieving X will make me OK, then I must not be OK if I fail to achieve X. The emotional theme of the perfectionist is "*not good enough*". Perfectionists are driven to do more and more because they never feel competent, worthy, and loved as they are. Thus, even when there's a profit on a trade, perfectionists will look for the portion of the move that they did not participate in. If they caught most the move, they will reprove themselves for not trading a larger position. And when trades don't go well, perfectionists review all the reasons that shouldn't have made the trade, should have known better, etc. By focusing on the portion of their performance that doesn't match their ideals, perfectionists transform successes into defeats, losses into failures. They rationalize their perfectionism as a drive for achievement, but all they are accomplishing is an undercutting of their confidence.

Perfectionism shows up as negative self-talk and self-blaming. Emotionally, we recognize perfectionism from frustrated, angry feelings when trades don't work out as planned. "Beating myself up" is how many perfectionists describe their self-talk. The way to beat perfectionism is to make a concerted effort to talk to yourself the way you would talk to a good friend in a situation where things went wrong. Most people know how to treat others with respect, love, and dignity. They just haven't learned to do the same for themselves. If you would be more nurturing, understanding, and supportive of a friend than you are of yourself in the identical situation, then you know that you're not being your own best friend. If a trade doesn't work out, the constructive trader focuses

on, "What can I learn from this?"—not "What's wrong with me?". In Woodie's language, the best antidote to perfectionism is the ability to reassure yourself, "There will be better trades down the road." The key is to not miss those better trades while you're beating yourself up!

Vice Number Two: EGO

Everyone likes to win in the markets. It's only natural to feel good when you've done your homework and end the day with a profit to reward your efforts. Ego involvement in trading, however, goes further than this. When the ego is involved, we write the market a blank check for our self-esteem. If trading is green, we feel good about ourselves; if we go into the red, we feel diminished. That places tremendous pressure on our trading over time. Not only do we have the burden and challenge of reading complex market patterns; now we also have a psychological gun pointed to our head ready to go off any time our pattern recognition fails us.

Most traders are aware of the dangers of trading with too much leverage. A trader accustomed to trading 2 lots, where each tick in the ES is worth $25, would feel overwhelmed jumping to 100 lots, where each tick now moves the account $1250. With the stakes raised to such a degree, the same trade would now no longer feel the same. It would be hard to let a position go against you by a point ($5000, instead of $100), and it would be difficult to let a profit run. When traders invest their feelings about themselves in their trading, they are operating with maximum *emotional* leverage. In the currency of self-esteem, they trade 100 lots. So much of their emotional account rides on each trade, that it inevitably affects decisions about cutting losses, letting profits run, and entering and exiting in a timely fashion. The successful trader wants their trades to work out; the ego-involved trader *needs* them to be profitable.

We know that ego threatens our trading when we find ourselves *needing* to trade just to win back some recently lost dollars; when we feel a desire to advertise our positions; and when we find ourselves riding an emotional roller coaster as profits wax and wane. Just as we can recognize traders' perfectionism from anger/frustration, we recognize ego-involved traders from euphoria/depression. If trading has us truly depressed, we know that it's not just our trading account that's hurting. The antidote to ego-involved trading is to place our self-esteem eggs in many baskets: recreational interests; other work involvements; relationships; and our spiritual lives. Many times we pour our self-esteem into trading because those other facets of our lives are not properly developed. A balanced life makes for balanced trading. In the spirit of Woodie's CCI Club, we can take some of the ego out of trading by learning from others, by becoming a candle that lights other candles, and by using a portion of market profits to help others make a wish that will come true. If your good feelings in life come from good relationships and worthy achievements, you won't *need* the markets for your happiness. Market success can be the frosting on the cake of your successful life, rarely can it substitute to the cake itself.

Vice Number Three: OVERCONFIDENCE

It is common for traders to complain of a lack of confidence in their trading, but very often it is overconfidence that does them in. Overconfidence results from a lack of appreciation of the complexity of markets and an underestimation of the challenges of trading them successfully. In a sense, overconfident traders lack respect for the markets. They think that reading about a few setups or buying the newest software will prepare them to make money. Overconfident traders don't want to work their way up the trading ladder: they resist the idea that screen time is the best teacher. They also chafe at the idea of growing their account. Rather than start with one contract and wait until they're profitable before trading larger size, they want big positions—and profits—right away. Because they're so eager to make money—and so sure they can make it—overconfident traders generally trade impulsively. They won't wait for the setup to form; they'll jump the gun—and get whipsawed in the process. Instead of being patient and waiting for short-term patterns to align with longer-term patterns, they will take every trade, enriching their brokers in the process.

The hallmark of overconfident traders is that they think they are going to make something happen in the market, instead of patiently waiting to take what the market gives them. Spelling out profit goals for each day or week of trading is one manifestation of overconfidence. Humble traders know that markets expand and contract their volatility—sometimes the trade just isn't there. The overconfident trader, however, feels that he/she is bigger than the market. Indeed, overconfident traders will often take great pains to try to catch the tops of bull swings or the bottoms of corrections. As a result, they often fight the market trend—and can get run over in the process. If the emotional signs of perfectionism are anger/frustration and the emotional signs of ego involvement are elation/depression, then the emotional signs of overconfidence are impatience/impulsivity. *Overconfident traders overtrade*. They fear missing opportunities more than they fear losing money. The antidote to overconfidence is rule-based trading and the intensive rehearsal of trading rules. By making entries, exits, stops, and position sizing rule-governed and vigorously rehearsing trading rules during simulated trading (as well as in real time with small positions), traders can greatly reduce their impulsive trading. Very often this means training oneself to focus on (and rehearse) what-if scenarios of being wrong in the market, as well as forcing oneself to spell out the rationale, targets, and stops for all trades. By making trading a more self-conscious process, traders interpose thought between impulse and action, gaining greater control of their trading. When the trading room admonishes, "No boasting, just posting", it is encouraging restraint on overconfidence.

Summary

Clearly, the three vices are not completely independent of one another. There can be significant overlap for traders. For example, a trader might take a position out of overconfidence, then hold onto it out of ego-related stubbornness and pride. Whether the

vice is perfectionism, ego, or overconfidence, the basic problem is the same: Making the trade about oneself, rather than about the markets. If you are thinking about yourself—how much you'll make or lose, how well or poorly you've done, how much you're a success or a loser, how much better you could have done—you can't be fully focused on the markets. It's not about you. It's about the setups and the ability to read them. And to read them, you must be one with them, immersed in them, so that you *feel* them, not just observe them. You can't feel the markets *and* become lost in feelings of anger, frustration, elation, guilt, depression, impatience, or impulsive need. The greatest vice in trading is to take it personally, to become so focused on the outcome of trading that you lose sight of the process. If you are fulfilled outside of trading, your other needs will not infiltrate your decision-making and sabotage your entries, exits, and money management. If you build yourself physically, socially, spiritually, and professionally, you will find that the markets won't need to bear the burden of carrying your identity. At that point, you'll be able to say (in your best Woodie voice):

We Don't Need No Stinkin' Vices!

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The Trader as Psychologist

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This is an excerpt from The Psychology of Trading (Wiley, 2003).

An important goal of this book is to help you approach trading the way a psychologist approaches his or her clients. I call this "trading from the couch," which means learning to utilize your thoughts, feelings, impulses, and behavioral patterns as *market data*. Trading from the couch entails an important shift from traditional thinking. Instead of trying to overcome or eliminate your emotions, this self-aware trading calls on you to *learn* from your reactions. Your goal is to turn yourself into a finely calibrated instrument for detecting and acting on the patterns of both the trader and the trading.

Note that cultivating such sensitivity does *not* mean simply going with your feelings in placing orders! As you will see in the coming pages, it often means the opposite: learning to use excess confidence and risk aversion as valuable *contrary* indicators. Surprisingly often—for the trader, as for the therapist—acting counter to one's initial impulses is the winning move.

In trading from the couch, you become your own psychologist. That is not an easy task in the markets or in everyday life. The rewards, however, are considerable. Trading, like competitive sports, is a powerful crucible for cultivating the emotional skills crucial to life success. In few arenas are the pursuit of values and the management of risk so tangible and immediate. Nothing so drives home lessons in self-understanding as brutal hits to one's bottom line.

Self-aware trading also presumes a vital symmetry: In mastering the markets, you can further yourself as a human being; and in developing yourself as a person, you can enhance your trading success. *Once you are able to extract the information contained within your emotional, cognitive, and behavioral patterns, you will be better equipped to identify and exploit the patterns that appear in the financial markets—and vice versa.*

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Three Dimensions (3D) Trader Personality Quiz

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Note: A version of this questionnaire will appear in Toni Turner's upcoming book, "Short-Term Trading in the New Stock Market"

When traders run into emotional difficulties with their trading, they often assume that they have deep, dark, underlying personality conflicts that require therapy. Sometimes this is true, but very often the source of the problems is different. Often there is a mismatch between the method or system that a trader is trading and the trader's needs and personality. Instead of berating themselves for a lack of "discipline", traders need to ask whether their challenges in following a methodology might be because the methods aren't right for them. Finding the proper fit between who you are and how you trade is a big part of finding success in trading.

The following questions are designed to help you assess facets of your personality that are related to the kinds of trading approaches that are likely to work for you. There are no right or wrong answers, and none of the questions are designed to evaluate your emotional stability or mental health. Rather, we are trying to find out your personal style, so that you can match it to your trading style. Each item consists of two statements. Please choose the statement that best describes you:

1a) I often arrive early for appointments and events to make sure I'm not late.
1b) I'm not very time-oriented and often show up late to appointments and events.

2a) When a problem occurs in my trading, I first feel frustrated and vent my feelings either outwardly or at myself.
2b) When a problem occurs in my trading, I first try to focus on what went wrong and what I can do to fix it.

3a) When I go out to eat, I generally go to my favorite restaurants and order my favorite foods.
3b) When I go out to eat, I like to try new and unfamiliar restaurants and foods.

4a) I tend to be detail-oriented and try to get each aspect of a job done as well as I can.
4b) I focus on the big picture instead of details and don't sweat the small aspects of a job.

5a) If you could hear the thoughts in my head as I'm trading, you'd hear worried or negative thoughts.
5b) If you could hear the thoughts in my head as I'm trading, you'd hear me analyzing the market action.

6a) If I had a choice of car to drive, I would choose one that is comfortable and quiet.
6b) If I had a choice of car to drive, I would choose one that is fast and that handles well.

7a) I would be good at following a diet or exercise program.
7b) I would often cheat on a diet or exercise program.

8a) It is hard for me to shake off setbacks in the market.
8b) I take market setbacks as a cost of doing business.

9a) I like vacations that are peaceful and relaxing.
9b) I like vacations where you see and do a lot of different things.

10a) I get routine maintenance done on my car when it is scheduled.
10b) I don't follow deadlines for routine maintenance on my car.

11a) Sometimes I feel on top of the world in the market; other times, I'm down or down on myself.
11b) I don't have many emotional ups or downs in the market.

12a) I would like a job with a stable company that pays a guaranteed salary and benefits, even if I might not get rich.
12b) I would like a job with a startup company that offers me a chance to get rich, even if I might get laid off if things don't work out.

13a) I try to eat healthy foods and get a good amount of exercise and rest.
13b) I'm very busy and don't always eat, exercise, and sleep as I should.

14a) I trade by my gut.
14b) I trade with my head.

15a) I avoid arguments and conflict.
15b) I like to argue and hash things out.

Scoring

Items 1, 4, 7, 10, and 13 measure a personality trait called "conscientiousness". A conscientious person is someone who has a high degree of self-control and perseverance. If you scored mostly a) responses for these items, you are high in conscientiousness. Conscientious traders are good rule-followers, and they often do well trading mechanical systems. Traders who are low in conscientiousness will have difficulty following explicit rules and often trade more discretionarily. Ideally, you want a style of trading that is more structured and detail-oriented if you are more conscientious. Trying to trade in a highly structured manner will only frustrate a trader who is low in conscientiousness. Such a trader would do better with big picture trades that do not require detailed rules and

analysis. Similarly, very active trading with rigid loss control will come easier to the conscientious trader; less frequent trades with wider risk parameters will come easier to the trader lower in conscientiousness.

Items 2, 5, 8, 11, and 14 measure a personality trait called “neuroticism”. Neuroticism is the tendency to experience negative emotions. If you scored mostly a) responses for these items, you are relative high in neuroticism. The trader prone to neuroticism tends to experience more emotional interference in his or her trading. Wins can create overconfidence; losses can create fear and hesitation. The trader who is low in neuroticism is more likely to react to trading problems with efforts at problem solving and analysis. He or she will not take wins or losses particularly personally. Neuroticism is a mixed bag when it comes to trading. Often the person who is high in neuroticism is emotionally sensitive and can use this sensitivity to obtain a gut feel for market action. The trader who is low in neuroticism may experience little emotional disruption with trading, but may also be closed off to subtle, intuitive cues when a trade starts to go sour. In my recent experience, I have been surprised at how successful gut traders are often relatively neurotic traders. Very active trading methods are particularly challenging for such traders, as they don’t allow much time for regaining emotional equilibrium after losses. This can lead to cascades of losses and significant drawdowns of equity. It is much easier for the non-neurotic trader to turn losses around, since these are less likely to be tied to self-esteem.

Items 3, 6, 9, 12, and 15 measure a trader’s risk aversion. A risk-averse trader is one who cannot tolerate the possibility of large losses and who would prefer smaller, more frequent wins with controlled losses to larger wins with greater drawdowns. If you scored mostly a) responses for these items, you are a relatively risk-averse trader. Trading with careful stops and money management, and trading smaller time-frames where risk can be controlled with the holding period will come most naturally for the risk-averse trader. The risk-seeking trader is one who enjoys stimulation and challenge. Larger positions and longer holding periods are easier to tolerate for the risk-seeking trader. Very often, the risk-seeking trader will be impulsive in entering trades and will have difficulty trading during periods of boredom (low volatility). The risk-averse trader often experiences difficulty hanging onto winning trades and will cut profits short to avoid reversals. This trader will be challenged during periods of high market volatility. Position sizing is key and often overlooked as a trading variable. Trading too small will bore the risk-seeking trader, who will then lose focus. Trading too large will overwhelm the risk-averse trader, who will also then lose focus.

Ultimately it is the blending of these three dimensions of trader personality and not any one in isolation that is most important in shaping trading outcomes. In my experience, the traders who are most poorly suited to trading are those that are risk seeking and who are low in conscientiousness and high in neuroticism. Such traders often take large gambles on impulse, and very often those impulses are driven by emotional frustrations. An example would be a trader who gets frustrated after a loss and doubles his position size on the next trade just to make the money back quickly.

Conversely, I have seen very few successful traders who were highly risk-averse. The risk-averse trader, particularly who is high in neuroticism, is motivated more by a fear of loss than a desire for gain. This makes it difficult to sustain meaningful position sizes during promising trades. Often such traders berate themselves for being self-defeating or sabotaging, but the reality is that they might be better suited for investing than trading.

If I had to identify an ideal personality pattern for traders, I would say that such a person would be risk-tolerant, low in neuroticism, and high in conscientiousness. Such traders are generally good at following trading rules (entries, exits, money management) and disciplined in their preparation. They don't take losses personally, which gives them the perseverance to weather losing periods. When they see a good trade, they are comfortable trading in size, so that the average size of their wins exceeds that of their losses.

Finally, let me mention one other important dimension that is related to neuroticism and emotionality. I strongly suspect that cognitive style is just as important as personality style in trading. Some people process information intuitively, relying on gut cues and subtle, non-verbal information. Others process information explicitly, through reasoning and analysis. Both cognitive styles can make traders money in the markets, but it is essential that one's cognitive style match one's trading methodology. As one trades shorter and shorter time frames, moving from swinging to scalping, it is less practical to expect explicit analytical routines to guide trading. Very short-term trading is more about pattern recognition than historical research. Conversely, longer-term trades often benefit from modeling and statistical analysis that inform traders where the edge might lie. How traders process information most effectively is a neglected variable in selecting proper time frames to trade.

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Trading as a Performance Sport

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This is a draft of an article that appeared on Linda Raschke's website at www.lbrgroup.com.

For the past 15 years, I have served as a therapist, counselor, mentor, and advisor to the medical students and physicians at an academic health center. Most of the people I work with are bright, motivated, educated individuals who are free from debilitating psychological problems. Their goal in counseling is to bring their performance to a higher level. They know that if they are going to be competitive in a field such as orthopedic surgery or emergency medicine, they need to be firing on all cylinders.

Interestingly, their interests and needs are not unlike those of Olympic athletes, active traders, bodybuilders, concert musicians and others engaged in performance-oriented pursuits. They realize that, if they spend years honing their skills, they can ill-afford to have their state of mind interfere with their peak performance.

The hypothesis I'd like to share with you is straightforward: There is a core set of characteristics that distinguish the greatest participants in any field of endeavor-including mastering the markets. If you read Jack Schwager's interviews with such accomplished traders as Mark Cook, Linda Bradford Raschke, and Mark Ritchie, you'll notice a recurring theme: success in trading is as much a function of the qualities of the trader as the system being traded.

In his text entitled "Greatness", Professor Dean Keith Simonton points out that mastery of any domain requires approximately 50,000 "chunks" of information. This applies across different domains, from chess and sports to scientific research. To acquire such a wealth of experience and data, the great individual needs to be able to sustain focused attention on work for considerable periods. The psychologist Mihalyi Czikszentmihalyi has found that this is possible because the creative person enters a pleasurable emotional state-a state of flow-when immersed in effortful activity. This intrinsic pleasure enables achievers to weather periods of uncertainty and discouragement on the way to success.

The implications of this line of research for trading are profound. Most texts on trading psychology emphasize such techniques as positive thinking and visualizations. These can be helpful, to be sure. But to transform oneself as a trader, it is necessary to transform one's state of consciousness. Traders lose when their mind states interfere with their natural processing of market data. To become a lean, mean, trading machine, it is necessary to cultivate the capacity to enter and sustain the flow state. Notice that Schwager found that most "Wizard" traders engage in extensive research and preparation before their trades. This is not simply a tool for scoping out the markets: it is mind-

training, developing the trader's capacity to stay immersed in their craft. Simonton also examined the specific works of some of the most eminent creative individuals in different fields and came to a startling conclusion. The odds of generating a work of lasting merit did not increase over the creator's lifetime. That is, the greatest writers, artists, and thinkers produced the same ratio of clunkers to works of genius throughout their careers. They were successful, Simonton notes, because they simply produced more. Whether a given work becomes famous or not is a matter of natural selection. Creative talents who are more productive increase their odds of generating a memorable work.

Once again, the implications for trading are clear. Even master traders are likely to produce a fair number of clunker trades. Like power hitters such as Mark McGuire, they will often strike out on their way to slugging a number of home runs. To become a master trader, traders need to trade, and need to continually hone their skills. Persistence, especially in the face of adversity, is a quality shared by most of the Wizard traders.

Indeed, in his excellent text "The Road to Excellence", K. Anders Ericsson concludes that future expert performers engage in intensive training activities over a period of ten or more years in the cultivation of superior performance. Success, he finds, is a function of intensive, deliberative practice conducted while in a state of heightened attention and concentration.

Ericsson likens the mind's development under such training to the physical benefits of athletic training. Former Mr. Universe and bodybuilding coach Mike Mentzer has written extensively on the benefits of high intensity strength training. It is the intensity of the workout-not its duration-that contributes to physical development; only under brief, intense demands will the body devote the resources to its muscles that become manifest as physique. Ericsson points out that superior performers conduct similar "natural experiments" with their growth, achieving unusual cognitive mastery through repeated, intense skill rehearsal.

From this research, we can infer two reasons why traders fail. First, they become emotionally involved in their trades-eager for profits, despairing of losses-and thus exit the flow state needed for immersion in the learning experience. One cannot be immersed in an experience and also preoccupied with its outcome.

The second reason traders fail is less appreciated. They lack the sustained concentration and focus needed to benefit from intensive practice. Imagine going to the gym and lifting a 20 pound barbell a few times. Surely we would not develop our strength or physique under such conditions. The capacity for trading success remains similarly dormant when traders attempt to beat the market with part-time preparation, impulsive hunches, and untested strategies. When asked to identify a loser on the trading floor, Wizard Tom Baldwin told Jack Schwager, "Losers don't work hard enough…They don't concentrate…You can see it in their eyes; it is almost as if there is a wall in front of their face."

To these worthy observations, I would add the following. If market opportunities are born

of inefficiencies inherent in human information processing, as behavioral finance researchers suggest, then the ability to profit from these opportunities requires the capacity to stand apart from such biases and patterns. One cannot simultaneously fall prey to human nature and profit from it. This requires a considerable measure of self-development, the kind that can only occur as the result of immersive experience and practice. Those who aspire to trading greatness must find some measure of greatness within. Such is the challenge and nobility of the path we've chosen.

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Trading as Mental Warfare

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Writings on the psychology of trading commonly view emotional conflicts and reaction patterns as impediments to successful trading. Accordingly, they advocate various therapeutic and self-improvement exercises to remove these obstacles. In this article, I propose a very different perspective: *trading as a military activity*, rather than a psychological one. Specifically, I will draw upon the military writings of Col. John R. Boyd to demonstrate that successful trading requires superior strategic prowess. As we shall see, this implies that one's growth as a trader may be more fruitfully pursued through systematic "combat" training than through traditional self-help exercises. This military framework forms the conceptual foundation for a research project already under way, in which researchers from the Massachusetts Institute of Technology (Andrew Lo and Dmitry Repin) are working with a successful trader (Linda Bradford Raschke) and a clinical psychologist (Brett Steenbarger) to explore the effects of emotions and training on the real-time trading results of over 100 traders.

Epistemology: How We Know What We Know

While Col. Boyd is most identified with his OODA (observe, orient, decide, act) framework for decision making in combat, the breadth of his work extended well into philosophy. Boyd was interested in epistemology: the study of knowledge and its acquisition. In this respect, his interests—and his thinking—parallel those of Swiss researcher Jean Piaget. An understanding of Boyd and Piaget's work will prove helpful in grasping the mind of the trader.

Boyd described the generation of knowledge and understanding as a process of creation and destruction. As David S. Fadok explains in his excellent thesis entitled John Boyd and John Warden: Air Power's Quest for Strategic Paralysis, Boyd equated creation with synthesis and destruction with analysis. In the face of changing realities and new information, people create fresh "mental images" of the world. They analyze new events and information and synthesize these into updated perspectives. In conditions of war, this facilitates adaptation to the uncertainties of battle. Quoting Boyd, Fadok explains that adaptation in wartime requires *mental agility*: "a process of reaching across many perspectives; pulling each and every one apart (analysis), all the while intuitively looking for those parts of the disassembled perspectives which naturally interconnect with one another to form a higher order, more general elaboration (synthesis) of what is taking place."

Students of psychology will find echoes of Jean Piaget's writings in Boyd's theory of knowledge. Both men are constructivists: they emphasize the processes by which we assemble our understandings of self and others. In place of creation (synthesis) and destruction (analysis), Piaget referred to assimilation and accommodation. These he

viewed as twin forces that allow individuals to maintain a dynamic equilibrium of knowledge. What Boyd refers to as mental images, Piaget calls schemas. These are mental maps that we construct that aid us in navigating reality. When we encounter events that do not neatly fit within our schemas, we try to reinterpret those events and assimilate them to our current mental maps. If such efforts at assimilation fail, we are forced to accommodate to the new reality and revise our schemas.

In his comprehensive book The Developmental Psychology of Jean Piaget, John Flavell summarizes a perspective that could be equally applied to Boyd: "The subject is construed to be an ever organized entity which accommodates its schemas (the basic units of this organization) to external reality as it assimilates the reality to the schemas." This ensures that knowledge becomes increasingly organized and complex, as it must account for an increasing body of life experience.

Boyd emphasized that this complexity is a precondition of survival, in life and in war. In his well known presentation, Patterns of Conflict, Boyd explained, "It is advantageous to possess a *variety* of responses that can be applied *rapidly* to gain sustenance, avoid danger, and diminish [the] adversary's capacity for independent action…To shape and adapt to change one cannot be passive; instead one must take the initiative." In other words, the accuracy and the speed with which individuals can revise their mental maps in the face of new realities will facilitate their survival. This simple principle forms the basis for a new perspective on the psychology of trading.

Speed of Processing: The Crucial Variable

Col. Boyd was a fighter pilot and chose aerial combat as the "point of departure" for his military theory. He was renowned for his challenge that he could place his plane in a position of disadvantage relative to any pursuer and outmaneuver the pursuer for strategic advantage within 40 seconds. Boyd never had to eat those words, and thus earned the nickname "Forty second Boyd." He attributed his success to his ability to outthink his adversary. By making unexpected maneuvers at opportune moments, he left his pursuer temporarily confused, opening a window of vulnerability—and opportunity.

Boyd referred to these maneuvers as "fast transients"—rapid, unexpected actions that violate the mental images (schemas) of the enemy. In Patterns of Conflict, he notes that the "idea of fast transients suggests that, in order to win, we should operate at a faster tempo or rhythm than our adversaries." Echoing Sun Tzu, he further explains, "Such activity will make us appear ambiguous (unpredictable) [and] thereby generate confusion and disorder among our adversaries—since our adversaries will be unable to generate mental images or pictures that agree with the menacing as well as faster transient rhythm or patterns they are competing against."

Victory in war, Boyd believed, was primarily a mental victory. By confusing and surprising the enemy, we wear down his ability to comprehend, adapt, and resist. Fadok explains, "The aim of Boyd's maneuver warfare is to render the enemy powerless *by denying him the time to mentally cope* with the rapidly unfolding, and naturally uncertain,

circumstances of war. One's military operations aim to 1) create and perpetuate a highly fluid and menacing state of affairs for the enemy, and 2) disrupt or incapacitate his ability to adapt to such an environment."

The winner in conflict is the one who is able to operate within the mental images (schemas) of the adversary. Once you know your enemy's mental maps, you can select opportunities to operate outside the rules and expectations of those maps, creating temporary disorientation. While the enemy is struggling to assimilate your new actions and accommodate to them, a window of vulnerability opens. This is a lightning process, requiring rapid judgment and action, as in the case of a 40 second dogfight.

The goal of such fast transient maneuvers, Boyd wrote, is to "enmesh [the] adversary in an amorphous, menacing, and unpredictable world of uncertainty, doubt, mistrust, confusion, disorder, fear, panic, chaos,…and/or fold [the] adversary back inside himself." This latter point is crucial. When the enemy is disoriented, he must "fold back inside himself" to adjust his thinking and redraw his maps. While he is so engrossed, he is unlikely to be able to keep up with the rapidly shifting realities of battle. Fadok quotes the essence of Boyd's thinking: "*You must get into the mind of humans. That's where the battles are won."*

One can find many examples of Boyd's principles in competitive sports and games. The successful chess player stays one or more moves ahead of his adversary, using surprise moves to break the opponent's strategy and create demoralization. The champion heavyweight Muhammad Ali repeatedly used psychological warfare to surprise and disorient his opponents. When he found out Sonny Liston had a fear of insane criminals during his incarceration, Ali (then fighting as Cassius Clay) purposely acted crazy in the pre-fight weigh-in, yelling and banging a walking stick. Liston declined to continue the fight after the seventh round, as much demoralized as battered.

Later, Ali accomplished a similar outcome against George Foreman in Zaire, during the famous "Rumble in the Jungle". Refusing to dance around the ring, Ali allowed the larger Foreman to pummel him and wear himself out. All the while, Ali taunted him: "Is that all you got? You hit like a sissy!" Worn out and discouraged, Foreman fell prey to an Ali right hand and couldn't respond to the ten count.

"Diminish [the] adversary's capacity while improving our capacity to adapt as an organic whole," Boyd advised, "so that our adversary cannot cope while we can cope with events/efforts as they unfold." By seizing the initiative and operating outside the schemas of the adversary, we create strategic advantage.

The OODA Loop

Suppose we, as traders, wish to duplicate the fast transient maneuverability of Col. Boyd and become "forty second traders". How might we operate?

First we would go to our trade stations and ***observe*** what the market is doing. Is it rising, falling, or consolidating? Is volatility increasing or waning?

Second, we would ***orient*** ourselves by placing the market's present action into context. Is the current day's activity occurring within a larger trend or within a broader trading range? Are various market sectors moving in concert, or are there discrepancies? What is the movement of interest rates, overseas markets, and commodities?

Third, we would ***decide*** upon a course of action once we had integrated the market's current action with the broader context of trading and economic forces. Our decision would be based upon the mental image of the situation we had created, such as a topping market gaining downside momentum in a rising interest rate environment.

Finally, once we had arrived at a trading decision, we would need to ***act*** and place orders based upon our mental maps. Our actions would reflect our judgments as to relative value in the market—where the market is properly valued for a purchase or sale—as well as our assessment of the proportion of assets to be devoted to the trade.

This four-part sequence of OODA—observe, orient, decide, and act—lies at the heart of Col. Boyd's theory of military strategy. Our continuous process of mental map building allows us to make sense of our observations, orient ourselves in conditions of danger, and take action based upon decisions that reflect updated realities. The tactical goal of war, Boyd emphasized, is to "observe-orient-decide-act more inconspicuously, more quickly, and with more irregularity…to repeatedly and unexpectedly penetrate vulnerabilities and weaknesses exposed by that effort."

Boyd describes OODA as a loop, not as a linear sequence. Our decisions and actions generate new observations that require renewed orientation and fresh decisions. The advantage in battle goes to the side that operates with the most rapid loops, adapting to changing conditions before the enemy, thereby opening windows of confusion and chaos that can be exploited.

The grand tactic of war, Boyd stressed, is to "operate inside adversary's observation-orientation-decision-action loops or get inside his mind-time-space." The most fundamental attack strategy, from this perspective, is the attack on the enemy's mind: an assault on his ability to process information and know reality. When we operate within the enemy's OODA loops, we can "penetrate [the] adversary's moral-mental-physical being to dissolve his moral fiber, disorient his mental images, disrupt his operations, and overload his system."

The key to operating within the enemy's cognitive loops is the use of surprise and unpredictability. Remember that it was the sudden, unexpected, extreme maneuver that allowed Boyd to evade his pursuer in aerial combat and plant himself on the pursuer's tail. "War is the province of uncertainty;" German military theorist Karl von Clausewitz observed, "three-fourths of the things on which action in war is based lie hidden in the fog of uncertainty." Strategy, for Boyd, is the art of increasing and exploiting this

uncertainty. In this, he is preceded by Napoleon—"The battlefield is a scene of constant chaos. The winner will be the one who controls that chaos, both his own and the enemy's."—and by Sun Tzu: "What is of supreme importance in war is to attack the enemy's strategy."

All warfare, for Boyd, is psychological warfare. From this premise, we can characterize the victor in battle: active, confident, planful, and orderly. We can also characterize the loser in any battle: reactive, demoralized, confused, and disorganized. The goal of combat is not merely to defeat the enemy through sheer force, but to defeat his will to resist. This is a marked departure from the school of thought derived from Henri Joumini, which declared the mass deployment of forces as the central tactic of warfare. Leading a battle, Boyd would be more likely to follow Rommel's *Blitzkriek* than the frontal attacks of General Lee.

Trading as Mental Warfare

The preceding exposition of Boyd's ideas, from epistemology to strategy, provides a foundation from which we can understand the challenge of trading the financial markets. Like the battlefield, trading offers an environment typified by risk, danger, and uncertainty. Trading also occurs in an environment that rewards the efficiency of mental processing. The successful trader is one who can rapidly observe market conditions, orient himself, integrate information into effective decisions, and quickly act upon those decisions. Indeed, a floor trader may need to operate with OODA loops that are tighter than even those of forty second Boyd!

Who, however, is the enemy in trading? To a certain degree, the adversary consists of other traders operating in the same markets. The futures markets are a zero sum game and, if one is to experience consistent success, it must be at the expense of other participants. The trader who watches volume pick up at a false breakout or late in a rise or decline is using that information to enter the OODA loops of other traders and can craft strategies that exploit that information. Knowing where the average trader is likely to place stops, for example, permits the experienced trader to enter the market just before these are hit, capitalizing upon the miniature panic of liquidation. Larger traders may even issue their own disinformation, masking their intentions to buy or sell or leaking misleading information to draw in the bulls or bears. Trading, in this context, is a chess game, with each player pitted against others in an ongoing series of moves and countermoves.

Boyd's ideas, however, raise a more intriguing possibility, in which the adversary in trading is the market itself. When you are trading the S&Ps, you are not merely trying to enter the OODA loop of rookie trader Joe Blow; you want to enter the market's loop as well. Like an enemy in wartime, the market masks its intentions with false moves, quick thrusts, and lengthy periods of inaction. In executing its function of efficiently allocating resources to enterprise and rewarding the prudent assumption of risk, the market *must* adapt to the trading patterns of the majority and, indeed, *must frustrate these patterns*. Capital markets would cease to function if, over the long haul, they failed to reward the

assumption of risk. Once the herd identifies a pattern within the market, following this pattern becomes the safest course of action—the path with least risk. This must, over time, be punished.

It is this tension between the risk aversion of the majority and the need for rewards to disproportionately accrue to risk takers that makes an adversary of the market. We see this in numerous studies of mean reversion in the markets: high volume stocks that have outperformed the market tend to underperform the market over a period of years; low volume winning stocks tend to outperform. Losing stocks tend to rebound and offer superior returns compared to winning stocks. The market is prone to rise when a weak open follows two or more days of decline and is prone to decline when huge buying interest, measured by the NYSE TICK, fails to move price significantly higher. "If it is obvious," market guru Joseph Granville used to say, "it is obviously wrong." The successful trader cannot merely follow the market, but must outwit it. He must figure out what the market is doing and act before the market has completed its move. This is what it means to operate within the market's OODA loop. Once the trader figures out how the market will punish risk aversion and reward risk assumption, he has tightened his own loop and now can outmaneuver the market.

Conversely, when the trader falls for the market's feints and parries, he enters a realm where the market now operates within his OODA loop. The market is shifting tactics faster than the trader can observe, orient, decide, and act, creating chaos and eventual demoralization. An important market corollary of Boyd's work is that fear and greed are not primary emotions in trading. Rather, the psychologically minded trader should look for the appearance of certainty versus confusion. Before a trader will fall prey to anxiety or depression, he will be confused. He will fail to update his mental images to account for shifting market realities. By the time he has reoriented and formulated a new course of action, the market has made its move, leaving him in the red. Only then will the emotions of fear and recrimination enter the picture. Left with demoralization, the trader may conclude that his emotions are his enemies. Nothing, however, could be further from the truth.

In reality, the trader's emotions have given useful and meaningful signals. The calm feeling of certainty known to every experienced trader and sometimes referred to as "the zone" suggests that the trader is operating within the market's OODA loop. Conversely, confusion and disorientation are sure indications that the market has invaded the trader's loop. Von Clausewitz stressed that defense was the essence of every war. Similarly, the decision to avoid trading during periods of confusion may be the trader's greatest weapon. Knowing when to fight is every bit as much a tactical advantage as knowing how to fight.

From the perspective of Boyd's military strategy, the primary objective of trading psychology is not to overcome emotion, but to create conditions conducive to "the zone" of certainty and antithetical to confusion. No therapy or self-help psychology can accomplish this; not in trading and not in war. Certainty can only be achieved through experience and superior training. No amount of positive thinking, visualizations, or any

of a myriad of self-help methods can substitute for the experience of having observed and oriented oneself under a variety of market conditions. "Untutored courage is useless in the face of educated bullets," General Patton observed. The market fires far too many educated bullets to allow untutored traders to survive on the financial battlefield.

Training for Trading

Speed, speed, speed is of the essence in war and in trading. "Don't delay," Patton advised, "The best is the enemy of the good. By this I mean that a good plan violently executed now is better than a perfect plan next week." Greatness in war has always required boldness and the ability to strike quickly. "L'audace, l'audace, toujours l'audace," Napoleon exclaimed. While impulsivity may have its costs, indecision is a greater threat. "It is better to act quickly and err," von Clausewitz explains, "than to hesitate until the time of action is past."

Speed is one element that distinguishes the trader from the investor. The investor has time to weigh alternate courses of action, research these, and implement them; portfolios may be adjusted a few times per year if even that. Traders, however, may place many trades within a day, or even an hour. The floor trader has no time to conduct historical research, consult multiple charts, or read research reports. His OODA loop has been so tightened that it now operates at speeds beyond that of explicit thought.

This creates an interesting psychological dilemma. The rapid trader is like the baseball hitter facing a 95 mile per hour fast ball. While he may enter the situation with a strategic aim—to bunt, hit to the opposite field, protect the plate—he has no time to consciously observe, orient, decide, and act as each pitch arrives. His OODA loop is implicit, rather than explicit, drawing upon years of experience watching the release of the pitcher, the rotation of the ball, the location of the pitch, etc. Indeed, any attempt to formulate an explicit strategy is apt to interfere with the batter's normal swing. Like a Zen archer, the batter must perform his actions naturally, without the interference of the conscious mind.

The pitcher, on the other hand, does not want the batter in "the zone". He wants to disrupt the batter's rhythm, create uncertainty, and—in Boyd's words—fold the adversary into himself. A pitch thrown too closely inside will create disruption, encouraging the batter to think of his safety instead of the next pitch. A fastball down the pike on an 0 and 2 pitch similarly attacks the hitter's expectations by violating the normal expectation of attempting to get the batter to swing at a pitch outside the strike zone to avoid a strikeout. The duel between pitcher and batter is an effort to outthink the opponent and enter his loops. The pitcher wins if he can make the batter think—if his disruptions and fast transient maneuvers force the batter out of the implicit processing of "the zone".

Similarly, the market wins most battles in which the short-term trader no longer functions automatically. Traders frequently ask me how they can sustain more positive thinking during their trades. My response is that they shouldn't be thinking during the

trade at all. If they are thinking, the market is almost surely inside their loops. Consider the example of driving. Under ideal conditions, you are not thinking about your driving. You may be listening to music, carrying on conversations, or daydreaming while performing the driving automatically. If you have to be thinking about the driving, it is because some hazardous road, vehicle, or weather conditions have arisen, or because you have become lost. At those points, you are adapting to an abnormal reality. Your exiting the loop of the automatic and entering into explicit thought suggests that you are no longer fully in control.

The trader should no more be performing positive thinking exercises than the batter or driver. The goal is to make trading automatic: to so tighten the OODA loop that it is no longer consciously driven. Clearly this can only be accomplished through training. Repetition and exposure—constant drilling—are needed to make learning automatic. In wartime, soldiers perform heroic actions not so much because they lack fear but because they are trained to do the right things under pressure. “Men are seldom born brave but they acquire courage through training and discipline,” the Roman military strategist Vegetius observed. “A handful of men inured to war proceed to certain victory; while on the contrary numerous armies of raw and undisciplined troops are but multitudes of men dragged to the slaughter.”

A careful inspection of training methods in sports, law enforcement, and the military suggests that superior performance is cultivated through intensive drilling under simulated conditions that mirror the risk and danger of real-world challenges. Soldiers, astronauts, and chess players are pushed by their mentors to face what-if scenarios that violate normal expectations. Only then can they develop the proper mental pictures that will orient them and guide their actions under threat. Facing these scenarios repeatedly tightens the loops and allows for rapid execution of decisions. Socrates was right when he said, “We are what we repeatedly do. Excellence, then, is a habit.”

The goal of trading psychology is not to create favorable states of mind. Rather, the goal is to create winning habits: to so prepare the trader for any scenario that he will remain inside the market’s loops even during periods of abnormal trending and volatility.

How Can We Train Superior Traders?

“There is nothing so practical as a good theory,” psychologist Kurt Lewin pointed out, and here is where we can observe the practical implications of Boyd’s work. To cultivate decision making within a 40 second loop, traders must train like fighter pilots. They must learn to think and react rapidly in the face of enemy maneuvers. The adversary is attempting to enter their mind-time-space; only superior information and processing of that information can prevent this from happening.

Below are several practical directions for the training of traders:

- ***The creation of multiple what-if scenarios during the trading day*** - Napoleon advised, “A general-in-chief should ask himself several times in the day, ‘What if

the enemy were to appear now in my front, or on my right, or my left?'" By expecting the unexpected, we can create proper schemas for guiding our decisions and actions, taking the advantage of surprise away from the adversary.

- ***Intensive drilling under practice conditions*** – Nearest neighbor statistical methods are techniques that allow one to identify past markets that are similar to the current market on one or more dimensions. For instance, if today's market is up in the morning after having risen yesterday afternoon from a five day low, I can query my database for all such days matching this pattern. By paper trading these similar days, I orient myself to the many market maneuvers that can occur under present conditions. The goal is not to predict what the market will do (the typical use of the nearest neighbor methodology), but to identify what the market **has done**, so that adaptive plans can be formulated for all contingencies.
- ***Rapid drilling under practice conditions*** – A soldier trained in survival may be deposited into unfamiliar terrain and then observed to see how well he copes. Rapid observation, orientation, decision, and action is needed so that the soldier will not fall victim to hostile environmental conditions, predators, or enemy action. Similarly, the trader can deposit himself in an unfamiliar market drawn from a historical database and rapidly execute trades. Like Boyd, the trader could issue challenges to the market: put me in a position of disadvantage and I will execute a winning trade within 40 seconds. While beginning traders will no doubt require more than 40 seconds to execute their loops, gradually tightening the time parameters will greatly facilitate the automatization of trading.
- ***Intensive mentoring*** – While we all admire self-made individuals, the reality is that superior athletes, soldiers, and traders are not created out of thin air. They are the product of years of training and mentoring. Wherever we see superior performance, it is the result of day in and day out teaching, drilling, and practicing. Traders often hope to learn their craft in seminars or through books. They are no more likely to succeed in this hope than concert pianists, chess players, armies, or Olympic athletes. It is the intensity of instruction that facilitates its internalization to the point at which learning is automatic and implicit. (See my article on Developing Market Expertise for a description of the psychology of implicit learning. This can be found at www.greatspeculations.com/brett.htm). Indeed, it would not be inaccurate to say that the entire purpose of training is to allow individuals to acquire the mental maps of their mentors so that they can eventually build upon these.

This three elements, then, form the core of training successful traders:

- ***Education*** – Teaching traders what to look for under different market conditions.
- ***Drilling*** – Performing regular exercises to build specific skills.
- ***Practice*** – Rehearsing trading under realistic conditions to assemble the skills into superior performance.

Based upon Boyd's work, I hypothesize that the intensive enactment of these three elements yields expertise by improving both the accuracy and the speed of one's mental processing, generating a richer array of mental images of the market, and a wider range

of response patterns for each image. At a psychological level, I hypothesize that the hallmark of successful trading is the reduction of the amount of time in which traders feel confused, surprised, or otherwise disoriented and an increase of the amount of time in which they feel confident, in control, and otherwise familiar with the market terrain.

These are testable hypotheses, and we may get a first test of them in research recently undertaken by Linda Bradford Raschke and a team of investigators from the Massachusetts Institute of Technology's Sloan School of Management. Led by Andrew Lo, Ph.D. and Dmitry Repin, Ph.D., this team will assist Linda and myself in evaluating the emotional functioning and trading performance of over 100 frequent traders. Moreover, the study will specifically investigate the emotional and trading impact of one month of intensive education, drilling, and practice led by Ms. Raschke, an accomplished mentor. For the first time, we will be able to put Boyd's ideas to work in a real time trading framework and see if expertise can be cultivated in the markets, as it is on the battlefield.

While one month is hardly enough time to generate mastery in any complex domain, it should be enough time to permit an internalization of basic skills, a developing sense of mastery, and improvement in trading results. We will report on the outcomes of this study in a future article and hope that it will raise as many fruitful questions as it answers: What training methods work best, and do certain methods work best for particular types of trading or traders? Does the intensity of practice and exposure accelerate the development of expertise? Is real time exposure to trading hazards necessary to the expansion of one's OODA loops or can realistic simulations accomplish this purpose?

We have just begun to scratch the surface of understanding the elements that contribute to trading excellence. Viewing trading as mental warfare opens the door to the study of all warfare and the moral elements that contribute to successful campaigns. Von Clausewitz once observed that war is filled with frictions: chance episodes that introduce uncertainty and doubt into the best-laid plans. "Is there any lubricant that will reduce this abrasion?" he asked. "Only one," was his answer. "Combat experience."

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Trading by Rules: A Psychological Perspective

Brett N. Steenbarger, Ph.D.

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The following was written in October, 2003 for Rickey Cheung's trading system website (www.rc3200.com).

If I had to give one piece of advice to most traders who are struggling with their P/L, it would be to trade tested systems or patterns and trade them systematically. If you look at highly successful business organizations, such as McDonald's, Dell, Federal Express, or Wal-Mart, you'll find companies that are doing the same thing, the same way, every day, with a high degree of consistency. They came up with a winning formula, which is half the battle, but they execute that formula with high fidelity and regularity. **That** is how you want to be trading.

So that brings up two important questions for any trader's self-assessment:

- Do I have a winning formula, and have I really tested it to **know** it's winning and to have the needed confidence in it?
- Am I executing my formula faithfully, and am I truly tracking each and every trade to **know** I'm following the formula and have the confidence in my ability to follow it?

A very large percentage of traders who have contacted me for assistance with their trading cannot honestly answer these questions in the affirmative. They want help for their psyches when what they need is to treat their trading like a world-class business.

Trading and Personality

About three years ago, Linda Raschke and I surveyed a group of approximately 64 active traders. We were interested in discovering whether there were any personality traits and coping styles that distinguished more successful traders from less successful ones. We obtained a number of thought-provoking findings. For example, we discovered that the winning traders tended to have lower levels of neuroticism (negative emotional experience) than their less successful counterparts. They also employed more problem-based coping methods (coping by developing strategies for dealing with threatening situations) relative to emotion-focused coping devices (coping by venting feelings or seeking support). Profitable traders, we found, scored higher on a trait called Conscientiousness, reflecting a general stick-to-it-iveness and motivation to follow through on plans and commitments. In all, these findings confirmed what many of us have observed informally in our careers in the markets: traders who temper their emotions and stick with trading plans fare better than their more emotional and impulsive peers.

One unexpected finding from our survey, however, was that a disproportionate number of the successful traders—about half—reported utilizing mechanical trading systems. Of the unsuccessful traders, none were mechanical traders. When I subsequently interviewed the successful traders, it turned out that even the ones that were not systems traders were basing their trades on patterns that they had carefully

researched. Conversely, almost to a person, the unsuccessful traders lacked such grounding in patterns and research.

In my recent book *The Psychology of Trading* (Wiley, 2002), I describe the orientation of these winning traders as *rule-governed*. A major reason they were successful, I believe, is that they used trading rules both to guide their trading and to maintain a positive mindframe. In this article, I would like to explore in detail why rule-governance is one of the most powerful psychological strategies one can employ in active trading.

<u>The Psychology of Rules</u>

What is a mechanical trading system? Basically, it is a set of rule to trade by. These serve several functions. The first such function is a *logical* one: they are designed to maximize profits by exploiting anomalies within relatively efficient markets. Every set of trading strategies incorporates what statisticians call Bayesian decision rules. That is, they establish Conditions A, B,…n that the market must meet before traders go long or short, stop a position, etc. The idea is that, without these Conditions being met, the forecast for any position going in your favor are determined by chance alone. Once we update this forecast when the Conditions are met, the odds now tilt in the trader's favor. While any single trade may not prove profitable, over enough time and with enough trades, these tilted odds should benefit the trader's equity curve, so long as the decision rules have been adequately researched. Here it is vital for any trader to know how the system was developed. Was it tested over a time period independent from the one used in its development? Is its real-time performance consistent with its historical track

record? Is the underlying logic of the system sound, or are there too many parameters, convoluted logic, or other signs of curve-fitting?

Less well appreciated is that such decision rules serve a second, *psychological* function. By reducing trading to a set of rules, traders lessen their ambiguity so that they can function in a relatively automatic mode. This permits a clear-headed monitoring of fresh trading opportunities, so that those improved odds can eventually work to one's favor. In reducing ambiguity, rules contribute to a sense of mastery and reduce much of the stress associated with high performance activity. Think about how stressful it would be to drive in a third-world country where traffic rules are not enforced! This is precisely the emotional state of many traders who function by the seat of their pants. The presence of rule governance lends order to an otherwise chaotic process.

In order for a system to serve as a psychological aid, however, it must fit well with the personality of the trader. Research conducted at the London Business School suggests that yet another personality trait—extraversion—is positively correlated with risk-tolerance. Some traders are much more risk-averse than others, simply as a function of their personality constellation. It is crucial that the system you trade take this into account. Thus, the total P/L of the system is only one parameter to evaluate when looking for the best way to trade. The drawdown statistics and the percentage of winning/losing trades may be key to traders' mental ecology. I have learned in my own trading, for example, that I am much more successful trading very short, intraday patterns than swing trading. With an average holding time of under 30 minutes, I can make small profits with consistency, maintain my trading focus, and limit my losses. While it is theoretically possible for me to make more money by holding on for the longer swings, in

practical reality this does not happen. The added volatility of the longer time frame interferes with my emotional state and decision-making, turning my profitable trading into one that is in clear non-compliance with minimum wage laws!

Trading is indeed a high-performance activity. Like other high performance domains, it requires directed effort. The football team going into a big game draws up a game plan; the army about to fight a war develops a battle plan; the master psychotherapist goes into sessions with a coherent strategy for assisting a patient. These plans are actually sets of interwoven rules that, as a whole, orient the performer as to the challenges that lie ahead. To the extent that the peak performer has a decision tree mapped out in advance, responses to situations can be made rapidly and decisively. In many fields—on the trading floor or in the operating room—the difference between success and failure can be a matter of seconds or minutes. This makes cognitive efficiency a prime ingredient of peak performance. By summarizing years of experience in a few statements, rules and plans promote such efficiency.

This brings us to another important psychological facet of rule governance: To promote efficiency in decision-making, rules must be simple. It is when these rules are assembled in a coordinated manner that they become plans that flexibly orient individuals to complex situations. In my own trading of the equity indexes, for example, I break each day down into four component mini-days: morning session, midday session, afternoon session, and overnight (Globex) session. I then assess market trends and trendiness, gauge the degree of institutional buying/selling, and look for tests and breakouts from one time period to the next for intraday trades. (See my Weblog at www.greatspeculations.com/brett/weblog.htm for details). By combining simple

decision rules with a segmentation of the trading day, I can approach each day with a flexible strategy that doesn't clutter my head.

Rules and the Brain

Advances in cognitive neuroscience are also helping illuminate the value of rules in guiding performance-based activity. We know that a region called the prefrontal cortex is largely responsible for what is known as the "executive functions" of the brain. These include planning, reasoning, problem solving, and many of the activities that allow us to engage in purposeful activity. When the prefrontal cortex is damaged, the result is a "dysexecutive syndrome" in which patients become unable to plan and execute complex activities. They are easily distracted, reflecting deficits in memory and concentration. As a result, even the simplest coordinated goal-oriented activity, such as grocery shopping, can be challenging.

Recent theories of attention deficit/hyperactivity syndrome (ADHD) suggest that deficits in the prefrontal cortex contribute to the distractibility and poor attention spans of hyperactive children. Indeed, imaging studies find reduced blood flow to the prefrontal regions of such children. *Interestingly, these are the same reduced blood flows that are observed among normal individuals during episodes of high emotional stress or frustration*. Because emotional experience is processed by lower brain structures, away from the prefrontal cortex, the relative cerebral blood flow to the frontal regions serves as a useful measure of a person's executive capacity. When people are highly frustrated, for example, their deactivation of the frontal cortex leaves them in a state where—temporarily—they are similar to the ADHD child or even the dysexecutive patient. How

many times did you look back on a losing trade and wonder if you were in your right mind when you placed the order? According to brain studies, you might not have been!

The traditional trading wisdom that says we need to control our emotions stems from the recognition that highly emotional states leave us more vulnerable to lapses in concentration and impulsive behavior. When we are activating the wrong brain regions, we can expect to make impaired trading decisions. *Rules enable us to stay grounded in proper trading practice regardless of the mindstate we are occupying at the time*. Indeed, the entire process of formulating, following, and coordinating rules activates those executive functions needed for proper trading. In a very real sense, staying rule-governed is a way of staying focused and rational. It is for this reason, I believe, that Linda and I observed that successful traders tend to be rule-governed and systematic.

Conclusion

It is common to hear traders assert that mental self-control is the key to stock market and futures profits. This article is suggesting that the reverse is equally true: *Staying grounded in solid trading rules and systems is one of the most powerful ways of maintaining a positive trading psychology*. When we are rule-governed, we are in a mental state that promotes efficient perception, problem solving, and action. Indeed, training ourselves to stay rule governed during trading rehearsals is an effective strategy for cultivating rule governance in real time.

Different rule systems may work better for different traders, depending on time frames and markets traded. My own rules make considerable use of such statistics as the NYSE TICK, the number of stocks advancing vs. declining on an intraday basis, and the number of stocks making new intraday highs and lows. Such rules would be poorly

suited to the trading of agricultural commodities, but have proven useful in trading intraday swings of the equity indexes. Other rules, such as pure price-based breakout methods, possess wider application across markets and might allow for the holding of positions for longer time frames to maximize potential gains.

Ultimately, the rules/systems you follow—and their linkage into coherent trading plans—must be well suited to your personality, including your risk-tolerance. Researching the performance of your system—discovering its weaknesses and strengths—and trading them with small initial positions is of immense help in building your trading confidence and ensuring that the rules work for you. If we believe many of the "Wizard" traders interviewed by Jack Schwager, a key to trading success is surviving one's own learning curve. Identifying the system(s) that work for you, translating them into consistent trading strategies, and learning to be comfortable with these is an important part of that process.

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Trading the Ranger Way:
Training the Elite Trader

Brett N. Steenbarger
Linda Bradford Raschke
Brace E. Barber

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> *Ranger School created a concentration camp-like atmosphere at the physical training (PT) pit. Large stadium lights stood around the perimeter of the area, and their glow cut through the blackness of the early morning. It gave us the eerie feeling that tall fences and armed men in watch towers were just beyond our vision in the darkness…We stood in box formations doing the various exercises commanded of us. After warming up, and especially after running, our heated bodies gave off steam like hot cups of coffee on a cold morning. In a way we were trapped, though voluntarily. We had signed our lives over to people we didn't know with the expectation that they would subject us to pain. Ranger students aren't necessarily guided by their left brain.*

Brace E. Barber
Ranger School: No Excuse Leadership
p. 109

The article you are about to read is a unique application of trading psychology. It is the product of an unusual collaboration between an Army Ranger and leadership expert (Brace); a master trader and educator of traders (Linda); and a professional psychologist/trader/researcher (Brett). In this article, we are going to challenge your notions about what it takes to become an elite trader of options and futures. Our goal is not to comfort your afflictions and reassure you that you'll be a great success in the markets. No, in the Ranger tradition, we are here to afflict your comfort. We are going to push you a bit beyond the boundaries of your normal thinking by introducing a new model for developing trading success. That push is important because, as we shall see, becoming part of any elite requires driving yourself beyond your self-defined boundaries.

Ready to challenge yourself? HOOAH! Let's roll…

Lessons From Brett: The Anatomy of Greatness

Psychology is not just the study and treatment of emotional problems. A large body of recent research has focused on individuals who are super-normal: those who have been highly creative, productive, and successful in their fields of endeavor. Summaries of this work can be found on Brett's webpage: www.greatspeculations.com/brett.htm and in his forthcoming book on The Psychology of Trading (Wiley; January 2003). Consider some of the more provocative findings:

- Highly successful individuals in sports, science, and the arts are distinguished by the amount of time they spend in intense, deliberative practice. Most have spent multiple hours each day for a number of years refining skills and immersing themselves in their craft. They find pleasure in this immersion and sustain a high degree of concentration during their practice sessions.

- Highly successful individuals across various fields are successful because they are unusually productive. Researcher Dean Keith Simonton of the University of California, Davis has found that the greats in any field produce the same ratio of unsuccessful works to successful ones as their less noteworthy peers. They succeed because they produce so many works that a few are likely to survive as major contributions.

- The combination of lengthy practice and sustained productivity means that successful individuals are unusually capable of sustaining effort, even under trying conditions. Because a sizable percentage of their works is unlikely to succeed, they require a high degree of emotional resilience to weather disappointment and fatigue.

Research on a phenomenon called *implicit learning* helps us understand how greatness is cultivated. Suppose subjects are asked to identify complex patterns from a stream of data with no idea of what they are looking for. They are only told whether their guesses are right or wrong. Over repeated trials—and with sufficient concentration and effort—subjects are able to achieve results far beyond what would be expected by chance.

Here, however, is the catch. While the subjects become excellent pattern recognizers, *they cannot verbalize the patterns that they are responding to*. This is why the learning is called implicit. After many hours of immersion, people know the patterns they are being exposed to, but they do not know that they know. Experience shapes their intuition.

Savvy traders of options and futures know the "tape feel" that results from long hours spent watching market action. *What is less apparent is that the implicit learning studies are actually duplicating the conditions under which greatness thrives*. By sustaining intense concentration, practice, and effort, subjects develop the kind of expertise—and confidence—cultivated by highly creative, successful individuals.

In the Ranger spirit, we challenge you to examine your own trading practices—especially the ways in which you practice trading. *Are* you practicing trading, or do you tell yourself that you will achieve superlative success by finding ever more complex trading formulas or mastering the perfect self-help technique? Research on extraordinary achievement suggests something different: ***Greatness arises from the continuous posing and surmounting of great challenges***. Accomplishment becomes automatic—a natural part of the self—when the repetition of a limited set of core skills becomes an ongoing part of one's daily routine.

Great challenges, tackled routinely—that, we are about to see, forms the basis of Ranger training.

Lessons From Brace: Transcending One's Limits

Brace has written extensively about Ranger training, and much valuable information can be found on his site: www.rangerschool.com. U.S. Army Ranger School is divided into three phases. The Fort Benning Phase is designed to develop basic military skills and physical and mental stamina. The Mountain Phase involves immersion in military mountaineering and battle tasks under conditions of severe weather, challenging terrain, and extreme hunger, thirst, and fatigue. The final, Florida Phase, pushes the Ranger to perform against opposing forces in a jungle/swamp environment while under high mental and physical stress. Only when these challenges are successfully met does the student earn the right to wear the coveted Ranger tab.

What is it about forcing individuals to perform complex, challenging tasks under conditions of extreme deprivation and stress that brings out the best in them? Ranger Lance Bagley, speaking of his experience in Ranger School, put it this way:

> *I learned that there is always something left. When I got to the point where reason said I couldn't continue, there was always something left…It was amazing to learn how far I could push myself, how far down I could go and still function, and what teamwork meant. To me, that was the essence of Ranger School.*

It is difficult to overestimate the confidence that results from successfully tackling the greatest challenges that can be thrown at you. This confidence, internalized at a deep, emotional level, emerges later in life whenever fresh challenges occur. Ranger W. John Hutt explains,

> *My Ranger School experience and learning how to operate under extreme pressure and scrutiny allows me to be cool under pressure now. The discomfort of reduced food and sleep added so much physical distraction to the already intense pressure on us that it makes it easy in the outside world to handle problems when those annoyances are absent.*

Trading futures and options is very similar to the challenges faced by the elite infantry soldier. Operating with high degrees of leverage, the trader performs under conditions of high risk where time is of the essence. There is also considerable uncertainty in both trading and combat, with the enemy always ready to take you out of the game. Nothing quite builds the sense of mastery for the beginning trader, for example, as successfully weathering the adversity of an initial drawdown.

The Rangers prepare men for real life stresses by teaching them basic skills—from land navigation and hand-to-hand combat to teamwork and leadership. Moreover, they review and drill these skills under conditions similar to those found in combat. *The*

goal is to rehearse basic values and skills so thoroughly, under so many challenging circumstances, that they will become automatic. In trading this means rehearsing all phases of trading: not just entry patterns, but also the all-important exit and money management strategies that maximize opportunity and manage risk.

The Ranger way of training recognizes a fundamental reality: ***You cannot prepare for extraordinary performance by rehearsing under ordinary conditions.*** Elite troops can only be forged from extraordinary challenges that force them to draw upon emotional and physical reserves *they never knew they possessed.* Many of the challenges posed by Ranger Instructors are unexpected ones that require quick thinking and responding. If you have drilled handling your worst-case trading scenario—as in a gap that opens against your position—you will feel confident in handling any situation that arises.

It is commonly heard that the majority of futures and options traders lose money over time. This is not because traders have not yet found the Holy Grail. *Rather, it is because traders fail to practice their skills and shape their plans in real time conditions of stress and uncertainty.* Indeed, the majority of traders do not practice their exits and money management disciplines at all!

Push yourself to identify how you develop yourself as a trader. Trading the Ranger way means conditioning yourself the way infantry soldiers build their conditioning. Experiencing intensive challenges in training allows skills to be so internalized that they emerge naturally in real-time. That is how successful traders can experience a Zen-like flow state when they are at their best—even in dangerous, volatile market conditions. Extraordinary challenges are *normal events* when you have encountered them repeatedly in training.

<u>Lessons From Linda: Speeding Up the OODA Loops</u>

When Linda needed a model for guiding her recent training project for traders, she did not turn to the fields of finance or psychology. Rather, she turned to the military and the writings of Colonel John R. Boyd.

Col. Boyd of the Air Force was a fighter pilot known for his challenge to fellow airmen. He allowed himself to be placed in a position of tactical disadvantage in an airfight and promised that, within 40 seconds, he would be on his adversary's tail, ready for the kill. Col. Boyd was never known to have lost this bet, earning him the nickname "Forty Second" Boyd.

During his career, Col. Boyd developed his approach to airborne combat into a comprehensive philosophy of military strategy. He described combat decision-making as a function of Observing, Orienting , Deciding, and Acting (OODA). These processes form loops, with new actions providing fresh observations and requiring renewed efforts at orienting and responding. The goal of military training, Boyd stressed, is to accelerate OODA loops, becoming more efficient than the enemy.

Trading futures and options requires especially tight OODA loops. There is always new action to Observe across multiple markets and indicators. This requires an ability to rapidly Orient and assess whether we are in trending or non-trending markets, volatile conditions or non-volatile, near support/resistance or away from it, etc. From our Orientation, we must rapidly create and update trading Decisions and then find the will and clarity to Act on these plans.

Ask yourself: Am I preparing myself to trade like Col. Boyd? Am I training myself to observe my market data, size up the action, craft a trading plan, and execute it all within a matter of seconds?

A glance through the Ranger Handbook offers some helpful clues as to how this might be accomplished. Much of the book is taken up with descriptions of drills and procedures, each broken down into easily identifiable components. By breaking complex processes down into clear components that can be reviewed and rehearsed, the Army ensures that they are in "an instinctive and familiar way of thinking for a platoon leader."

Making complex skills instinctive and familiar is the key to tightening OODA loops. Col. Boyd could never have overcome his adversaries in forty seconds if he had to consciously analyze and plan each of his maneuvers. It was because these maneuvers were overlearned to the point of becoming automatic that he was able to operate within his opponent's mindset.

Elite traders of futures and options also need to make complex decisions within a time frame measured in seconds. This can only happen if they have broken their trading down into easily identifiable processes that can then be rehearsed under pressure until they are second nature. The process of development being followed in Linda's training project can be described in three stages:

- ***Skill*** – A trading skill or pattern to trade is taught to the trader or identified by the trader as having profit potential. This corresponds to the Observe phase in Boyd's OODA loop.

- ***Drill*** – The trading skill or pattern is rehearsed, first via walk-throughs (simulated trades on historical data) and then by paper trading live markets. The trader learns to recognize opportunities to utilize the skills and patterns as trading conditions unfold and formulate trading plans based upon the incoming data. This corresponds to the Orient and Decide phases of Boyd's loop.

- ***Fulfill*** – The trader's development culminates in the fulfillment of actual trades in real time utilizing the entry, exit, and money management skills that have been rehearsed. This provides practice in "pulling the trigger" on one's decisions: the Act phase of Boyd's loop.

In Linda's trading chatroom, which trains traders under real-time conditions (www.mrci.com/lbr), Linda and Brett—working together with a team of researchers under Andrew Lo, Ph.D. from the Massachusetts Institute of Technology's Sloan School of Management—are investigating the training of traders. Linda assists traders enrolled in the study with their entries and then challenges them to manage the trades on their own, reviewing their results at the end of each day. This provides daily experience in skill/drill/fulfill training. Preliminary results suggest that traders can indeed acquire the skills and methods of a veteran trader and improve their performance.

Putting It All Together: The Ranger Way

If you ask the average trader what makes for success, you will probably hear about two things: good techniques and proper psychology. We are presenting a different perspective: *Successful trading is the result of a learning process*. It is the same learning process that can be found among great contributors in any field of endeavor, and it is a learning process that can be accelerated through intensive training. Our experience—in psychotherapy, military training, and trading—is that weeks of consistent, hands-on, real-time rehearsal are more valuable than months or even years of leisurely activity.

The Ranger model of training is particularly promising for futures and options traders because it has a long track record of producing high-performance professionals in a relatively short training period. The steepness of the Ranger's learning curve is a function of several factors, including the breaking down of skills into bite-sized components; the relentless rehearsal of those skills in realistic conditions; and the practice of skills in the face of extreme environmental, emotional, and physical challenges.

Our current research will show us whether daily experiences with skills and drills can help traders fulfill their highest aspirations. In future research, we hope to introduce elements of extreme challenge into the training to determine whether or not this will accelerate learning and improve performance. For example, we may have traders rehearse their skills under conditions of high fatigue, distraction, or time pressure as ways of simulating decision-making under fire. This truly would train traders the Ranger way!

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Training New Traders: What Makes for Success

Brett N. Steenbarger, Ph.D.

www.brettsteenbarger.com

As the coordinator of a training program for new traders at a large, proprietary trading firm in Chicago, I have had an unusually privileged perch from which to view success and failure among new traders. There is a general consensus in the trading community that, over time, the markets have become more efficient, making it more difficult to exploit inefficiencies. There is also a consensus that market challenges are only likely to increase, given the continued expansion of computerized trading. When you consider the many thousands of individuals who tackle trading and the percentage who can consistently sustain a living from their trading, you realize that trading is no different from acting or sports: many are called, few are chosen.

I am often asked about the internship program that I direct at Kingstree Trading, LLC. The question most often posed is, "What are you looking for among applicants?" My usual response is to turn the question around: "What do you have to bring?" I know that if the answer is some variation of the theme of motivation, that the questioner won't make it either in our program or in trading. Motivation is necessary for success, but not sufficient. There are very specific skill sets required for success in trading, just as there are for athletics, chess, or professional dance. No one would plausibly claim that motivation would qualify him or her for a spot on the Chicago Bulls or Joffrey Ballet Company. Why should motivation qualify one as a superlative trader?

Interestingly, the "motivation" response generally means that the applicant is motivated to succeed at trading. It doesn't mean that the individual is motivated to put in the work required to succeed at trading. You would be amazed at how many traders say they are motivated, when what they really mean is that they would dearly love to be successful. These are the same traders who leave the office at the sounding of the closing bell, who show no evidence of having studied the markets after hours and on weekends, and who put minimum effort into studying their own performance. Even when these traders keep a journal, the entries consist of superficial comments, written in a few minutes time, containing such generalities as, "I need to be more disciplined." What form of discipline is needed? Why have they failed in their discipline? How will they be disciplined in the future? What specific steps will they take to implement the discipline? How will they track their progress with these steps? All these questions remain unanswered, because answering them takes real effort and real motivation. Desire is not motivation. Motivation is measured by demonstrated effort; not feeling, not good intentions to make efforts.

Many successful traders I know started their careers by intensively reviewing their trading at the end of each session. After hours they would study their trades, observing how the market moved, reviewing their trading decisions. Along the way they

made notes, highlighting what they did right and wrong. From those notes, they developed specific things to look for in the market; specific things to do or not do in their trading. Such review took hours each night. But, just like Greg Maddux reviewing tapes of the batters he would face the next day, it gave those traders a level of preparation that others lacked. The cumulative impact of daily review meant that, after a few months, the hard working traders had far more exposure to the patterns of the market—and their own patterns—than the "motivated" traders. That is why those hard workers built a career as Kingstree traders, while others were unable to do so.

My personal belief is that we are rapidly reaching a time when a trader's potential will be evaluated objectively, through carefully crafted metrics, and not just subjectively through self-report and simple P/L summaries. As markets become more efficient, trading firms will increasingly turn to such objective tools to assess the factors that lie beyond motivation: aptitudes. At Kingstree Trading, we have taken the first step toward such performance-based training by incorporating an advanced internship into our program. Following the first, introductory month, interns select the market(s) of their choice and begin an intensive month of simulation-based trading under the direct observation of a mentor. Performance statistics are gathered at the close of each session, and feedback is offered as the trade is occurring for real-time work on trading skills. Without having the worries of profit/loss, advanced interns are encouraged to experiment with strategies, trade with size, and identify their particular strengths and weaknesses. We believe this new facet of the training program has the potential to accelerate the trader's learning curve and cut the amount of time it takes to "become green".

Firms often say they're looking for motivated traders, but the sword cuts both ways: those firms are "motivated" to hire successful traders, but often show little evidence of putting in the hard work needed to develop trader competence. How much time and effort does a trading organization put into mentorship, direct teaching, and the detailed assessment of performance? In sports or professional dance, coaches/teachers intensively practice with their pupils every single day. Does that happen at the trading firm you are considering? Think about it: If a mentor is spending hours with traders each day, he or she will not have time to trade. That means that the firm has to subsidize his or her salary—a major commitment. If the only mentorship is a few words of wisdom after the close of trade from people more interested in their own trading, you have to wonder about that firm's "motivation".

Successful traders possess some edge in the marketplace that distinguishes them from the thousands of other market participants. What is going to be your edge? What evidence do you have, right now, that leads you to believe that you can cultivate that edge? Those are some of the questions we ask of applicants, and they are ones that beginning and experienced traders alike should be prepared to answer. "Passion", "motivation", "desire", and "hard work" are wonderful, but ultimately those have to be yoked to skills. Observe and interview traders, read about traders, try trading in a simulation mode: learn about those skills. Ask yourself, honestly, if you possess those skills and—if the answer is yes—then develop a plan to hone those. That is what makes for success in trading.

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Trusting the Rally

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This is a draft of an article that appeared on the MSN Money website

(www.moneycentral.com) in October, 2002.

It was Thursday, October 10th and the S&P 500 Index was rallying off a morning low that had dipped below its July bottom. As the market roared into positive territory, I commented to a friend, "This rally looks for real." His response took me a bit by surprise given the seeming market vigor. "No way," he declared. "I'm not getting in. I don't trust this market."

In retrospect his response made sense. Since the peak in the S&P 500 Index, we have had a decline that has cut the average nearly in half: from 1527.51 on March 24, 2000 to 768.63 as of October 10, 2002. As Table One indicates, during that period we have had five rallies of 10% or more in the S&P, including the recent bounce off the Thursday low. Four of those five rallies ultimately gave way to significantly lower prices. Beneath my friend's response is an important question: What is to say that *this* is the rally that can be trusted?

In this article, I will take a look at historic market bottoms and attempt to draw a profile of bottoming processes. The goal of this profiling is to discover objective criteria that can inform investment decisions that are colored neither by the greed of bottom fishing nor the fear of market weakness. As we shall see, the profile that will emerge

may prove most useful in determining whether we are witnessing the beginning of a new bull market or just another load of bull courtesy of the bears.

Date of Rally Start Level of the S&P 500	**Date of Rally End Level of the S&P 500**	**% Change in S&P During the Rally**
4/14/00 1339.40	9/1/00 1530.09	14.30%
3/22/01 1081.19	5/22/01 1315.93	21.71%
9/21/01 944.75	1/7/02 1176.97	24.58%
7/24/02 775.68	8/22/02 965	24.41%
10/9/02 768.63	As of 10/15/02 881.27	14.65%

Table One – Rallies in the S&P 500 Cash Index During the Market Decline from 3/00 to 10/02

<u>A Psychological Perspective on Profiling</u>

Creating a market profile to build trust in investment is akin to a strategy I employ with clients who have been burned in romantic relationships. Very often the hurt party has experienced a series of disappointments in one or more relationships in which trust was betrayed. This makes it difficult to contemplate entering new relationships. “I just don’t trust men!” is a common refrain among many women I have counseled following a marital infidelity.

This, of course, creates an emotional Catch 22. It is impossible to regain trust in relationships without experiencing trustworthiness, and it is impossible to re-enter a relationship until a measure of trust has been regained. The dilemma of the investor is similar. Successful experience is needed to regain confidence in the market, and yet the investor cannot achieve such an experience staying on the sidelines!

The profile I create with my clients helps address this quandary. We go back in time and review every significant relationship the person has experienced: trustworthy and untrustworthy ones. We carefully catalog the characteristics of the trustworthy people, and we ferret out the similarities among those who cannot be trusted. Although this is unpleasant at first, reminding people of painful experiences, it soon becomes an enjoyable task. As the profiles of the “good” and “bad” people take shape, people realize that there are *patterns* to success and failure in relationships. If they can gradually move forward with dating, screen people based on the profiles, and begin relationships with only those who display the positive patterns, suddenly it becomes possible to pursue relationships *while* building trust. The profile places the client in a position of control by ensuring that he or she will only give their heart to a worthy partner.

A profile of market bottoms, I propose, might accomplish something similar. What we will look for are characteristics in the market that distinguish long-term bottoms—ones that yield meaningful ongoing rallies—from short-term bottom points that are ultimately reversed. This will require a fair amount of cataloguing, but ultimately should provide investors with a heightened degree of control as they contemplate re-entering roiling market waters.

Profiles of Market Bottoms I: New Annual Lows

As I reviewed summary statistics of major market bottoms from 1965 through the present, one statistic immediately jumped out at me. Whenever the number of stocks making new 52 week lows swamped the number making new annual highs, a rally was shortly at hand. From a psychological vantage point, this makes sense. At market bottoms, investors are dumping the stocks of good companies along with the bad. The surge in the number of stocks making 52 week lows suggests that selling has reached exhaustion levels of negativity.

Finding a threshold number of annual new lows for testing my hypothesis was a bit tricky, since the number of stocks traded over the past 40 years has expanded significantly. Accordingly, I calculated the number of new 52 week lows as a percentage of the issues traded for that day. My cutoff point was 25%: I looked at the market making a potential bottom whenever one fourth of the issues traded that day hit 52 week lows.

To begin the profile, I examined 8954 days from March, 1965 to October, 2000, focusing on the S&P 500 Index. My goal was to predict the market's subsequent movement over the next 500 days, which is roughly a two-year span. Interestingly, there

were only 63 days in which 25% or more of NYSE traded stocks made new annual lows. On 56 of the 63 occasions, the market was higher after 500 days. A negative return was achieved only 7 times. The median change for the 63 occasions was 34.18%, which more than doubled the median gain of the S&P for the remainder of the sample, which was 15.44%. In other words, an investor who bought stocks when 25% or more of issues were making 52 week new lows achieved double the return of an investor who bought at other times, and they made money on roughly 90% of occasions. That seems like a promising start to the profile.

While promising, however, the new lows indicator is far from perfect. On many occasions, the market registered 25% or greater new lows only to fall even further and expand the proportion of stocks trading at an annual nadir. For example, we hit the threshold level in May, 1966, but did not bottom in the market until October, when prices were lower. Similarly, the 25% criterion was hit in July, 1974 and August, 1998, but prices did not bottom until lower levels were achieved in December and October of those years respectively. Making an investment when the market first registered a quarter of issues making new 52 week lows subjected intrepid souls to a fair degree of drawdown in their accounts, even though they generally came out ahead 500 days later.

The 7 occasions when the market lost money 500 days following the attainment of the 25% benchmark all occurred in 1973. The market dropped precipitously from its 1972 high, but did not bottom until 1974. It is quite likely as well that the extended market declines during the 1930s and 1940s might have shown negative 500 day returns as well, although data on stocks making new annual lows during that time were not available to me for testing. The conclusion, then, is that a surfeit of new lows may be

necessary to the making of a durable market bottom, but not sufficient. We need to elaborate our profile.

Profile of Market Bottoms II: Market Advances

In a recent MSN Money article that I wrote with Jon Markman, we reported on the research of Lowry's Reports, which undertook a similar profiling of market bottoms. They discovered that important market bottoms were characterized by a series of days in which 90% of volume was concentrated in declining stocks and 90% of all price change registered by stocks was negative. Following this series was a series of positive 90% days, which displayed the reverse pattern. It appeared from the Lowry work that a second characteristic of market bottoms is a level of pricing that is so attractive to long-term investors that it yields a buying stampede.

I decided to test this idea by tracking the proportion of stocks traded during the day that advanced in price relative to those that either declined or remained constant. Specifically, I set a 60% threshold, and declared that any day in which 60% or more of issues traded were advancing was an "upthrust" day. I then examined important market bottoms since 1965 to see if there was a pattern to these upthrusts. I especially focused on series of upthrust days that were not interrupted by "downthrust" days, in which 20% or fewer of traded stocks advanced. Table Two summarizes these results.

Date of Bottom	Pattern of Upthrust Days Following Bottom
October 10, 1966	Four days of upthrust 10/12/66 - 11/16/66 with no intervening downthrust days
May 26, 1970	Five days of upthrust 5/27/70 - 6/3/70 with no intervening downthrust days
October 3, 1974	Four days of upthrust 10/7/74 - 10/14/74 with no intervening downthrust days
August 12, 1982	Eight days of upthrust 8/17/82 - 9/3/82 with no intervening downthrust days
October 20, 1987	Four days of upthrust 10/30/87 - 11/12/87 with no intervening downthrust days
October 11, 1990	Five days of upthrust 1/17/91 - 2/11/91 with no intervening downthrust days
October 8, 1998	Five days of upthrust 10/12/98 - 11/2/98 with no intervening downthrust days

Table Two – Patterns of Upthrust Days Following Major Market Bottoms

A series of four upthrust days (four days in which advancing stocks constituted 60% or more of issues traded) without an intervening downthrust day (a day in which advancing stocks constituted 20% or less of issues traded) typified the action following a major bottom in which 25% or more issues traded registered annual new lows. Conversely, when 25+% of issues reached 52 week new lows but four uninterrupted upthrusts were not attained, the market was more likely to continue lower before eventually bottoming, as in 1973, 1981, and August, 1990.

This supports the notion advanced in Lowry's Reports that a bottom is not in place until buyers perceive such value that they flock into the market. The criterion of 60+% advancing issues in a day appears to capture this dynamic. Note, however, that, while the buying fervor often occurs shortly after the ultimate low is reached, there can be a considerable delay. We did not see a series of upthrust days following the October, 1990 low, for example, until early 1991. It is also possible for the market to make a marginal new low on some indexes following a valid series of upthrusts, as occurred in 1974. Although the market upthrusts occurred in October, 1974, the Dow Jones Industrial Average made a new low in December of that year before the market took off in 1975 with a series of five uninterrupted upthrusts from December 31, 1974 through January 10, 1975.

Where Do We Stand Now?

At the July 24th bottom, we registered 26.66% of stocks making new 52 week lows, meeting our first criterion of indiscriminate selling. Between July 29 and August 26, we had nine uninterrupted upthrust days, exceeding our second criterion of four such days in which buyers perceive unusual value in the market. Recently, on October 10th, we made a marginal new low in the S&P, much as did the Dow in December, 1974 following the October upthrusts. If the July signals are valid for a coming bull market, we should see considerable upthrust from the recent October low. Indeed, since that point we have registered two upthrust days on October 11th and 15th. We need at least two more such days, uninterrupted by a downthrust day, to adequately sound the all-clear signal. While there is no guarantee that such a series of days will generate outsized returns to the upside for months to come, the historical record certainly favors 500 day periods following downturns in which more than a quarter of traded issues make yearly lows. When a series of upthrusts follow such downturns, the record has been unblemished since 1966.

It is likely that other criteria of extreme selling and buying could work even more effectively than the two that I have incorporated in the current profile. Regardless of the criteria and testing employed, the important idea is that investors can regain their footing by trusting their research, rather than trusting the market. Like my risk wary clients who pursue good relationships by keeping their profiles firmly in mind, it is possible to pursue promising markets by staying disciplined in time-tested criteria. We are not yet at a point where bulls can uncork the champagne, but the profile suggests we are not far from that point either.

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What It Takes to Win in the Markets

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Note: The following is an excerpt from Gail Osten's interview with Brett Steenbarger in the March, 2003 issue of Stock, Futures, and Options (SFO) magazine entitled "The Windmills of Your Mind and the Pathway to Your Trades". The entire interview can be accessed at www.sfomag.com.

Gail Osten: I have to believe that the majority of people in this world are part-time traders.

Brett Steenbarger: I think that's true, so maybe even more important than whether they are in the market part-time or full-time is how much time they're spending researching the markets and preparing their trading, because that ends up being a big part of the full-time commitment.

Gail Osten: OK. Then I can make the differentiation between a part-time trader that is well-prepared and one that just pretends he or she is.

Brett Steenbarger: I'll give you a great personal example. The last two days of trading, I have been in the market a total of 30 minutes—that's maximum. Definitely not more. I've placed three trades in the last two days, and I've been in the market less than 30 minutes total. In those two days, I have easily spent 10-12 hours in preparation. So it gives you an idea of what full-time commitment means. It's not simply being in the market full-time; it's working at your craft. And to do that, you've got to love it. You've got to love finding the patterns, discovering the patterns, researching. You have to enjoy the discovery process every bit as much as you love getting in there and taking your profits.

… No one reasonably pretends that someone is going to become a master surgeon or a chess champion or a master artist by doing it on a part-time basis. I think the same is true for trading. So much of the element of success comes from the long hours of research and immersion in the markets, that it becomes a full-time enterprise—even if you're not necessarily trading every minute of the day in the pits.

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When to Play

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In a game of Texas Hold'em, each player receives two cards initially. Then the betting begins. After that round, the dealer uncovers a set of three cards. These cards, called the flop, are available for use by all players to create the strongest possible hand. Then another round of betting commences. Next, for all who decide to stay in the game, a single card—the turn—is uncovered. This, too, is available to all players. After yet another round of betting, the final communal card—the river—is turned over. At that point, there is a showdown and the strongest hand takes the pot.

One of the cardinal skills of Texas Hold'em is the decision of when to play and not play. Do you fold, do you call, or do you raise? All you see initially are the two pocket cards. You have no idea of the cards held by the other players or the cards you might be able to use from the flop, turn, and river. All you can do is try to assess your odds and the competition. The player who has done his research knows that, in an eight hour poker game where 35 games per hour are played, the number of times he will be dealt an unsuited Ace, King will average between three and four. Those are rare, good pocket cards and you have to play them. Conversely, a low, nonconsecutive, unsuited hand gives little in the way of odds and, in a game with ten other strong players, you would be wise to fold and wait for something better.

Traders face the same question of when to play. If they are trading frequently on an intraday basis, they want volatility—even if there is no dominant trend. Good intraday swings provide a number of opportunities to make money on the long and short side. Conversely, low volatility days will meander in a tight range for hours at a time. Even if your timing is good enough to catch a swing within the tight range, the accumulated commissions over the day can eat you up.

To address the issue of when to play, I looked at the Spiders (SPY), which closely mimic the S&P emini futures. I selected the period from September, 2002 to the present (8/27/04), which included 493 trading days, and I calculated the correlation between the day's volume and the day's range. Note that, in calculating the range, I am examining the difference between the highest and lowest points actually traded during the day—not the day's price change (which could be a function of overnight trading). The day's range is a particularly relevant measure of volatility for the intraday trader. Interestingly, the correlation was a highly significant .605. Stated in other terms, about 36% of a day's volatility is accounted for by the day's volume.

That provides us with a potential edge. After the market opens, you—the trader—are dealt two pocket cards. All you see is what the market has done during the initial period of trading. You have to decide whether you fold or bet. As the trading game progresses,

the next time periods provide you with the flop. Once again, you decide that the day is offering you a great hand—and you eventually go all in—or that you'll bet more modestly or not at all. Still later, in the afternoon, the market reveals the turn and river and decide how, if at all, you'll stay in the game. By looking at the volume of the market hand you've drawn, you can make some inferences about that market's volatility. If the overnight Globex session has shown unusually high volume and volatility, I can look for a wider range in early morning trading. If the morning trade—my pocket cards—shows little volume, I have little reason to expect a wide-range trending movement in the midday (when volume and volatility tend to be lowest in general).

Just as in poker, the market player updates estimates of odds with each new "card" that is revealed. Is volume and volatility, relative to recent historic averages, growing or shrinking? Is it historically low, average, or high? Is there enough movement here to make me want to play the game?

The professional poker player Ken Warren advises, "The important thing to remember is that your goal is not to play hands of poker, but to make the best decisions hand in and hand out. You're playing to win money, not to play cards, as paradoxical as that sounds." Similarly, your goal as a trader is to make money, not to trade. If the market is not providing you with tradable swings, do you want to be in the game? The really good poker players—and traders—know not only how to play, but when not to play.

There is one important difference, however, between poker and trading. In poker, you can draw a 7♥2♣ and bluff the table, betting aggressively and making others think that you've drawn the nuts. Other players might even capitulate and cede the pot to you. In trading, unless you trade enough size to move the market, there is no bluffing when the opening period provides a narrow range on low volume. If you go all in, betting on a breakout move, there is a good likelihood that you'll be revisiting the opposite side of the trading range before that breakout ever occurs. Those are the situations that separate traders who *want* to trade from those who *need* to trade.

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Why We Trade

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Why do we trade? To be sure, trading allows us independence, the opportunity to work for ourselves. Trading also offers the prospects of a lifestyle in which evenings and weekends need not be consumed by work. Some of us crave the competitive aspect of trading, doing fresh battle each day. Others approach trading as a puzzle to be solved, deriving a sense of intellectual achievement. Finally, there is income. A successful trader can make seven figures in a year—and many of the traders I work with are living proof of that.

So why do *they* trade? Once you have the money, all of trading's lifestyle advantages could easily be yours. Needs for competition and intellectual stimulation could be met in so many other ways. Why do traders remain traders long after they've won the game?

Perhaps we can illuminate this question by asking it of practitioners in other fields. Why do artists continue their craft long after they receive recognition for their paintings, novels, or films? Why do elite Special Forces troops stay in units that test their mettle even after they've earned their coveted badges? A gifted athlete such as Michael Jordan earned plenty of money and honors and, in fact, did retire on a couple of occasions—only to return to his game. Why?

There is something deep here that speaks to the nature of productive work. People retire from jobs and even careers, but they never abandon their *callings*. For some, work means something more than earning a living or achieving a lifestyle. Work is their path in life. It is the way they have chosen—or perhaps that has chosen them—for self-expression and self-development.

Suppose the pastor of a large, successful church wrote a book, made significant money, and promptly retired from the clergy and all religious life. What would that say? Surely, we would think, this person's faith could not have been too heartfelt. But why should our productive work mean less to us than the clergy means to a devout pastor? Presumably, the religious life meets deep, important needs for the pastor. Is it really so different for the artist? The athlete? The trader?

The great professions are those that serve as personal playing fields. They are the arenas we choose to express and develop ourselves. In mastering a discipline, we cultivate self-mastery. In writing a poem or placing a large trade, we capture—in a single act—our vision of how we see the world at that moment. The great occupations are great precisely because they are such meaningful playing fields. Long after we've earned fame and fortune, the calling remains to be more than we are, to return to the arena and do

battle with our limitations. The profound urge to extend the human grasp is common to all the great callings. To run faster, to capture more beauty, to predict ever better: in no small measure, our work is our pursuit of the godlike, however fleeting.

Maybe it is our different images of the godlike that animate our career choices. If my deepest view of godhood is that of a meek and all-forgiving Christ, perhaps I will be drawn to an occupation of service. If my deepest view is more akin to the ancient Greeks, whose gods sent heroes on quests, then my calling may be on a battlefield or a playing field. Either way, in work we find something divine within ourselves. Whether as scientists, monks, or traders, we strive for those moments when we are just a little closer to perfection, a little nearer to immortality. *That* is why we trade.

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Will Your Portfolio Become a Prisoner of War?

Lessons From History and Psychology

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This is a draft of an article that appeared on the MSN Money website (www.moneycentral.com) in February, 2003.

"War is good for the economy". "The market is retreating on war fears." Investors often entertain contradictory notions regarding the impact of war upon their portfolios. Many look to the last Gulf War for guidance, expecting that market prices will decline before the first shots are fired, only to rebound thereafter. If this is the way markets typically respond to war, the current prewar environment may present opportunities. Conversely, prewar bullishness may merely reflect the "availability heuristic" described by Amos Tversky and Daniel Kahnemann, where we base our conclusions on only the most available, recent wartime data.

How do markets respond to international hostilities, and what might this mean for current investors? In this article, I will touch upon psychological research on stress to suggest that the relationship between stock market performance and wartime is a function of uncertainty. As a proxy for the economic value of entire countries, markets discount unfavorable or doubtful war outcomes and accord premiums to nations that succeed in conflict. Indeed, a careful examination of the trajectory of equity prices during recent

wars suggests that the fortunes of markets and wars are closely intertwined, with important implications for your portfolio.

Stress and Uncertainty

A large body of research finds that there is a curvilinear relationship between the probability of negative outcomes and emotional stress. When the probability of receiving an electric shock, for example, is close to zero, people feel safe and do not display such stress responses as elevated heart rate, galvanic skin response (sweating), and stress-related hormones. At the other extreme, when the probability of getting the shock is close to 100%, individuals typically respond with coping measures and control their stress response. When the prospect of being shocked is near 50%, however, there is considerable uncertainty. Not knowing how or when to cope, the uncertain individual displays highly elevated stress reactions. Indeed, uncertainty is so intolerable that even experimental animals will choose a predictable powerful shock over an uncertain, but lesser jolt.

Extending this research to markets leads to what might be called a **Fortunes of War Hypothesis**: *As a country becomes successful in its war efforts, investors will view the future with greater certainty and optimism and reward that country's markets with increasing prices. When the outcomes of war look unfavorable or are unknown, investors will shy away from the markets, resulting in decreasing prices.*

Let's take a historical look at markets and wars and see how well this hypothesis holds up.

Markets and Fortunes of War

World War II offers a dramatic illustration of the ways in which market outcomes are linked to the fortunes of war. The Fortunes of War Hypothesis, for example, would lead us to conclude that the market performance of the eventual war losers (the Axis powers) would fall short of the performance of the winners (Allied powers). That, indeed, appears to be the case.

According to data compiled by London Business School's Elroy Dimson, Paul Marsh, and Mike Staunton (Triumph of the Optimists; Princeton University Press, 2002), the stock, bond, and bill markets of the U.S., U.K., and Switzerland significantly outperformed the German, Italian, and Japanese markets during the decade from 1940-1949. As Table One indicates at the end of this article, the stock markets of the winners showed positive real returns during the war and postwar years, and the markets of the losers displayed negative real returns, partially due to the depreciation of the losers' currencies during the war.

An even more fine-grained analysis of wartime events in World War II supports our hypothesis. Although the U.S. did not formally become involved in World War II until 1941, the Dow Jones Industrial Average ($INDU) had been responding to war events well before then. When Germany began its offensive against Western Europe in May, 1940, resulting in the defeat of Belgium, Norway, and France, the Dow swooned approximately 25% in two months. Following U.S. President Franklin Delano Roosevelt's declaration of an "unlimited national emergency" on May 27, 1941, the Dow managed a small rally, but was unable to exceed the highs of the previous May.

On October 27th of that year, Roosevelt delivered his Navy Day speech, claiming possession of a secret map that detailed Hitler's plans for a "new world order", including the Americas. Several days later, the U.S. destroyer Reuben James was sunk and two weeks after that the House approved a revision to the Neutrality Act, paving the way for U.S. participation in the war. Faced with new uncertainty and then the defeat at Pearl Harbor, the Dow promptly began a two month, near-20% descent from its early October peak: a peak that would not be exceeded until early 1943, after the war. It was not until the turnaround battles of Midway in the Pacific (June, 1942) and El Alamein (November, 1942) that the Dow was able to sustain a rise from its bottom. Churchill's later remark, "Before Alamein we never had a victory. After Alamein we never had a defeat" neatly summed up the Dow's fortunes, which moved from a low of 92.92 in April, 1942 to 165.44 on April 30, 1945, with Hitler's suicide.

<u>Later Wars and the Markets</u>

Similar correlations between war outcomes and market fortunes can be observed during the Korean, Vietnam, and Gulf Wars. The initial phase of the Korean war in late June and early July, 1950 saw an immediate 10% decline in the Dow, with the North Korean capture of Seoul, Inch'on, and Taejon. With initial U.S. victories in August of that year, the Dow recovered most of its losses that month. Market prices stayed in a narrow range as the Communist Chinese took the offensive in November and December, 1950, but then rose above their start-of-war highs in early 1951, as U.N. forces recaptured Inch'on and Seoul. By the armistice signing on July 27th, the Dow stood at 259.23, approximately 20% above its lows early in the war.

During the Vietnam War, the North Vietnamese Tet Offensive, which began on January 31, 1968, represented a military success for the U.S. and South Vietnamese. It was widely regarded as turning American sentiment against the war, however, as it became clear that a protracted conflict was at hand. The Dow dropped nearly 10% between January and March of that year, rebounding only after President Johnson's surprise announcement at the end of that month that he was halting bombing and declining to run for reelection. With the start of American troop withdrawal in June, 1969, growing public protest, and no victory in sight, the Dow began a descent of over 20% into May, 1970. Rising interest rates—in part an inflationary consequence of monetary policy during the prolonged war—took a recessionary toll on the economy. This toll continued through 1974, following the cease-fire agreement of January 27, 1973 and the resignation of a politically weakened President Nixon in August, 1974. By the time Saigon fell to the Communist offensive on April 30, 1975, the Dow had put in its bottom—well over 50% below its prewar highs in real terms.

The Gulf War, in many ways, was the reverse of the Vietnamese experience. Commencing in August, 1990 with Iraq's invasion of Kuwait, the entire "Desert Storm" campaign—from January 16, 1991 to February 27th, lasted 43 days and resulted in a clear-cut victory. Interestingly, the Dow made its bottom on October 11th in the days following the Iraqi invasion but prior to the onset of U.S. military involvement. As it became clear that world support—and military might—was behind Kuwait and the U.S., the Dow rose over 4% the day following the start of battle and, by the end of hostilities, had jumped over 15%.

Conclusions

Although the above relationships between markets and wars are suggestive, it would be a mistake to assume that all market outcomes in wartime are attributable to the fortunes of combat. It is true that U.S. market performance was sunnier following wars in which we were either successful (World War II, Gulf War) or at least not unsuccessful (Korean War) compared with the less favorable Vietnam years. Still, not all of this can be attributed to wartime outcomes. The late 1960s and early 1970s, for example, were a period of high worldwide inflation, resulting in negative real performance among many world bourses—including those of countries not directly involved in the Vietnam conflict.

It may well be that unfavorable war outcomes only damage markets when they take a significant political and economic toll, weakening a country's leadership and making it at least temporarily less desirable—and more uncertain—as an investment haven. Post-Vietnam America, with its weakened Nixon leadership and high inflation economy, would be a far less certain and attractive investment arena than post-Gulf War America. A short, favorable war can be expected to bring greater certainty and optimism to investors than a lengthy, unsuccessful conflict.

What are the implications for today? The earliest phases of war, in which outcomes are most uncertain, have uniformly brought market declines. Only once it becomes clear that war is proceeding toward a successful conclusion have those declines been reversed. In the context of the current Iraq crisis, this means that we must ask the question of what will constitute victory.

Unlike prior wars, the battle lines are unclearly drawn. If the enemy is Saddam Hussein and the desired outcome is regime change, it is conceivable that this could be accomplished relatively quickly, to the delight of the markets. While sorting out a post-Saddam leadership may pose thorny political dilemmas and factional turmoil, this would only affect the U.S. and world economies insofar as it undermines regional stability and the vital oil markets.

The linkage of the Iraqi conflict to the "War on Terrorism", however, makes it a war within a war. It is not clear that the defeat of Hussein would imply the defeat of terrorism and, indeed, it is conceivable that the radical Islamic response to a U.S. victory in Iraq might include heightened terrorism. The markets would likely cheer the defeat of terrorism with a response that would rival the post-war rallies of the 20th century. What needs to happen to create the perception of such defeat, however, is not obvious. One candidate is the wresting of oil revenues from regimes that directly or indirectly support terrorist causes. To the degree that the pending war accomplishes that end in Iraq and invokes the threat of similar consequences in neighboring countries, the War on Terrorism might be able to claim its first decisive victory. This would considerably reduce investor uncertainty, strengthen public support of the American President, and cheer the markets.

In themselves, however, individual victories—even against Iraq—will not necessarily defeat terrorism. This has been the experience of Israel, which has devoted considerable resources to homeland security, with some notable success. Nonetheless, its economy remains mired in a three-year recession with double-digit unemployment. Its battle against terrorism appears unending, and its leadership has been battered. A rapid

victory against Iraq would no doubt buoy the markets. Until investors can construe such victory as a turnaround in the War Against Terrorism and reduce their general uncertainty, however, history suggests that gains will be constrained.

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Table One

Real Returns of Markets During the Decade of World War II

	Equities	Bonds	Bills	Inflation Rate
U.S.	4.0	(2.1)	(4.7)	5.4
U.K.	3.1	0.7	(2.0)	2.8
Switzerland	4.0	(1.0)	(2.9)	4.5
Germany	(10.3)	(20.8)	(2.4)	4.5
Italy	(11.5)	(27.6)	(29.7)	47.0
Japan	(25.7)	(35.2)	(32.9)	54.8