Thinking, feeling and deciding: the influence of emotions on the decision making and performance of traders

Journal Item

THINKING, FEELING AND DECIDING: THE INFLUENCE OF EMOTIONS ON THE DECISION MAKING AND PERFORMANCE OF TRADERS

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ABSTRACT

We report on a qualitative investigation of the influence of emotions on the decision-making of traders in four City of London investment banks, a setting where work has been predominantly theorized as dominated by rational analysis. We conclude that emotions and their regulation play a central role in traders' decision-making. We find differences between high and low performing traders in how they engage with their intuitions, and that different strategies for emotion regulation have material consequences for trader behavior and performance. Traders deploying antecedent-focused emotional regulation strategies achieve a performance advantage over those employing primarily response-focused strategies. We argue that, in particular, response-focused approaches incur a performance penalty, in part because of the reduced opportunity to combine analysis with the use of affective cues in making intuitive judgments. We discuss the implications for our understanding of emotion and decision making, and for traders' practice.

INTRODUCTION

In this paper we describe a qualitative study which develops our understanding of the role of emotion, intuition and emotion regulation in financial decision-making. The study addresses three research questions. First, it tests whether emotions play a significant role in decision-making in financial trading, which has been characterized as rational in the classical economic sense. A second question concerns the nature of traders' own understanding of the role played by emotion and affectively cued intuitions in their decision making performance. A third question is whether there is a link between traders' emotion regulation strategies, engagement with affectively cued intuitions and decision making performance.

Neo-classical financial economics has been a prime influence on research into markets and market behavior. Traders within financial markets have been understood as profit maximizers who act on price information, which summarizes all available knowledge about asset values (Fama, 1991; 1998). Financial markets are designed to be transparent and have low transaction costs such that profit opportunities are only fleetingly available and market imperfections are eradicated (MacKenzie, 2006). Within this paradigm there are strong assumptions about investor rationality and the nature of investor preferences.

Understanding of markets and market behavior has been developed by the advent of behavioral finance (De Bondt, Palm, & Wolff, 2004; Thaler, 1993) which has drawn upon the insights of cognitive psychology to incorporate the "irrational" elements of cognitive biases and collective sentiments, such as herding behavior, into models of financial decision making. Behavioral finance has had some success in modeling investor behavior and explaining well known deviations of market behavior from the predictions of the efficient markets hypothesis – a mainstay of the neo-classical paradigm (Fama, 1991). However, within this field of study, the main role accorded to emotions to date is that they are portrayed as interfering with rational

cognition, or they are seen as outcomes of the decision process affecting anticipated utility. In neither case are they acknowledged as integral and primary in their effects on choice and action (e.g. Shefrin, 2000; Peterson 2007). The trader practitioner literature, though, is full of references to emotion and 'market sentiment'. For example: -

> *"Trading is emotion. It is mass psychology, greed and fear."* (Marcus in Schwager, 1993: 49)

Despite renewed interest in emotions and emotion regulation in the workplace, applied empirical work in field settings has been limited (Seo, Barrett, & Bartunek, 2004) and has largely focused on the relatively narrow domain of emotional labor, or emotions have been decontextualized. In this paper we examine the impact of traders' emotions on their perceptions, behavior and performance in financial markets using interview data from 118 professional traders and 10 senior managers in investment banks. We consider traders' understanding of the role of emotion in their trading practice and seek to shed light on the ways in which traders experience and regulate work-related emotions and how these processes change with increased expertise. We also explore the relationship between traders' experience of emotion, emotion regulation, and expert performance. Our goal is to build a bridge between experimental and neuroscience research into the role of emotions and rich accounts of traders' lived experience of emotion in their thinking, deciding and acting (Sayer, 1997).

The structure of this paper is as follows. First, we review relevant literature on emotions and cognitions in decision-making and on emotion regulation, including studies of traders and investors. Second, we use qualitative data from interviews with traders and their managers to address our research questions and discuss the data in relation to the literature. We consider and codify traders' accounts of the role of emotion in their work and explore the relationship between

emotion regulation, approach to engaging with intuition, and trader performance. Finally, we consider the theoretical and practical implications of our findings.

THEORETICAL ORIENTATION

The Relationship between Emotion and Cognition

Cognition as a field of study within psychology emerged in the middle of the 20th century as a reaction to the dominance of behaviorism (Miller, 2003). A guiding metaphor for much cognitive psychology has been the brain-as-computer; an analogy which leaves little place for emotion except as a disturbance of optimal cognitive functioning or as a signaling system that accompanies action and experience. Thinking has been understood as quite apart from feeling. In a major review of research into the relationships between emotions and cognition, Phelps (2006) concludes that understanding the role and significance of emotion is critical to understanding cognition. It has become clear that cognition is not only affected by emotion, but that emotion is central to our cognitive functioning. Current models have converged on dual processing theories of cognition (Bechara et al, 1997; Buck, 1999) which suggest that decision-making is underpinned by two parallel processes. System one is rapid; pattern recognition activates emotionally weighted biases which in turn activate stored behavioral repertoires. This process is non-conscious, with important parallels to perceptual processes and linked to intuitive decision making (Dane & Pratt, 2007; Epstein et al, 1996). System two, the slower process, involves conscious deliberation and analysis (the executive function); facts are represented and weighed, options are generated and compared, potential outcomes are modeled and learned reasoning strategies are applied.

Models of the dual process approach consider these two decision processes not as completely separate but as interacting. Conscious analysis of a situation can affect emotional

appraisal and immediate affective response may be one input among others into deliberation. Most of our behaviors (and associated decisions) happen in an automatic fashion with minimal active participation by the conscious self unless we are confronted with a novel situation (Bargh et al, 1996) or uncertainty (Tiedens & Linton, 2001). The brain's capacity for conscious deliberation is limited and can be depleted, much as a muscle can become exhausted (Baumeister et al, 1998; Muraven & Baumeister, 2000). Thus, particularly in fast-paced and demanding environments, conscious deliberation is reserved for tasks that are accorded the highest priority. Emotions have an important role as cues to decision making. Finucane et al. (2000) suggest that emotions act as a heuristic. That is, emotions provide an accessible summary of experience, cognitions and memories. One might expect that traders, given the volume of decision demands, will engage in a great deal of automatic decision making and use emotional cues. There is some empirical evidence supporting this view. Lo and Repin (2002) carried out a small-scale study of the physiological responses (blood pressure and skin conductance) of professional traders (N=10) to actual market events. They found emotional arousal to be a significant factor in the real-time financial decision-making of both novice and experienced traders. Less experienced traders showed stronger arousal in response to short-term market fluctuations than more experienced traders, indicating that emotions are particularly important in relatively novel situations that require cognitive effort.

Emotion and Decision-Making Performance

There is evidence that emotions affect decision-making performance. First, there is a range of evidence that emotions can induce biases in decision-making. Emotions can skew information retrieval. For example there is evidence that it is most easy to recall experiences that are congruent with current emotional state (Bower, 1981, 1991; Mayer et al. 1990). Emotions also directly bias decision-making; for example fear and anger have significant (and opposite)

effects on risk perceptions (Lerner & Keltner 2001; Lerner et al., 2004). Additionally, emotions bias the value attached to outcomes. For example intense negative emotions enhance valuation of short-term outcomes regardless of negative long term consequences (Gray 1999). Overall, positive affect tends to be associated with optimistic decision making, and negative affect with pessimistic choices (Isen, et al., 1978; Johnson & Tversky, 1983; Kavanagh & Bower, 1985; Mayer & Hanson, 1995; Schwarz & Clore, 1983; Wright & Bower, 1992).

Emotions also have a role in risk-related decision making. A laboratory study of financial decision-making under risk found that low levels of emotional experience led to higher levels of performance through greater risk neutrality due to a more constant association between objective gain and subjective value (Schunk & Betsch, 2006). Lo et al. (2005) found clear associations between day-traders' emotions, their decision making and performance. There was evidence that positive decision-making outcomes, as assessed by profits and losses, were associated positively with pleasant affect (e.g. content) and negative outcomes with unpleasant affect (e.g. bored). Furthermore, investors who experienced more intense positive and negative emotional reactions to gain and loss were poorer performers than those with more attenuated emotional responses. The authors suggested that rapid, emotional decision making is unsuited to the complex, information-rich environment of trading. The trading practitioner literature also tends to promote the view that emotions are detrimental to decision making, exemplified in the following quotation from highly rated trader Bruce Kovner. "*Whenever a trader says 'I wish' or 'I hope', he is engaging in a destructive way of thinking because it takes away from the diagnostic thought process*" (Schwager, 1993: 82). In contrast, Seo and Barrett (2007) carried out a study of investment club members, using an internet-based investment simulation accompanied by emotional-state surveys. They found that individuals who experienced more intense emotions achieved higher decision-making performance.

Thus while there is ample evidence that emotions affect decision-making performance, including for traders, the evidence on the nature of that impact is mixed. While there is evidence for the biasing effect of emotions, there is also evidence that we rely on emotional cues in rapid, automatic decision-making, and they confer a tangible advantage to everyday decision-making (Bechara et al., 1997).

Research into the nature of expertise has tended to characterize intuition (a form of experientially-based pattern recognition linked to the affectively cued system 1 (Dane and Pratt, 2007)) as integral to expert performance –e.g. Dreyfus & Dreyfus, 2005; Klein et al., 1986; Stokes et al., 1997). Dane and Pratt (2007) note an important distinction between, on the one hand, the decision heuristics literature, which mainly supports a view of intuitive decision-making as inferior to more rational models; and, on the other, the literature on expertise, which emphasizes the central role of intuition in expert performance. A crucial difference between these literatures is the different emphasis placed on research method and context. Research on decision heuristics is often context free and relies heavily on experiments using subjects who are inexperienced in the tasks studied. There is also evidence that some of the key cognitive biases identified as maladaptive products of heuristic reasoning in experimental settings either do not occur, or lead to better outcomes when decision-making is studied in the field or studied using approaches that approximate real life contexts (Todd & Gigerenzer, 2007). The expertise literature, in contrast, places great emphasis on domain specific knowledge and skills, on the development of complex cognitive schema that enable rapid associative pattern recognition, and on the activation of extensive and complex behavioral repertoires. Dane and Pratt (2007) argue that, in consequence, intuition will be more likely to function as an effective component of decision-making in performance domains that require significant experience and complex domain relevant schema, a description which fits the world of financial trading.

In summary, the emotions literature gives considerable support to the idea that emotions have multiple critical impacts on decision-making. Some of these can be characterized as bias with the potential to be detrimental to decision-making performance. However, it is also apparent that there is an alternative position: it is not emotions *per se* that are detrimental to decision-making performance, but rather that expertise and the regulation of emotions determine whether emotions have positive or negative impacts on decision performance.

Emotion Regulation

Accounts of *emotions as bias* focus primarily on the potential for emotions to have a negative influence on performance. By contrast, accounts of *emotions as information* focus primarily on the valuable role of emotions in encapsulating prior relevant experience. In principle, these two perspectives may not incompatible and effective emotion regulation may have a role in reducing the biasing effect of emotion while retaining sensitivity to the information which emotions may carry. It thus seems likely that the regulation of emotion may play an important role in emotion performance effects. Gross (2002; Gross & Thompson, 2007), distinguishes a series of different stages in emotion episodes and five associated emotion regulation strategies. The model suggests that people both choose and modify situations. Situations require attention and appraisal, which leads to an emotional response.

Attempts to manage emotions may focus on any of the stages indicated in the above model. One approach to managing emotions is to select, avoid, or modify situations. Other approaches include focusing attention on emotionally salient elements of a situation and, where emotional responses might be difficult to cope with, reframing situations to modify the emotional response. It is also possible to avoid emotional responses by refocusing attention elsewhere. Each of these strategies could lead to responses being modulated or suppressed. Gross and Thompson (2007: 16) make clear that this model of emotions and their regulation is something of a

simplification. However, the model usefully illustrates the central role of emotion regulation in decision-making.

In addition to theoretical modeling, there is empirical evidence for a relationship between strategies for emotion regulation and a range of important outcomes. Recent research has paid particular attention to the difference in outcomes between antecedent-focused emotion regulation strategies, which seek to change emotions before emotion responses have become fully activated, and response-focused regulation strategies, which modify behavior and emotion expression once the emotion response is underway. Emotion regulation strategies have been shown to have differential effects on outcomes including cognitive performance, health, and qualities of social interaction (Gross and Thompson, 2007). In the domain of work performance much attention has focused on the emotional labor required by customer service interactions. Here, emotion regulation has been characterized as a process of deep and surface acting. Surface acting is the faking of emotion display to accord with organization display rules. Deep acting involves modifying inner feelings. Grandey (2000) considers emotional labor as a subset of emotion regulation and equates antecedent-focused and response-focused regulation with deep and surface acting respectively. In a study of front-line service workers Grandey (2003) found antecedent-focused emotion regulation was associated with greater effectiveness in relating to customers in a warm friendly manner while response-focused emotion regulation was associated with emotional exhaustion and greater tendency to 'break character' and reveal negative emotions in a service encounter. This result supports Gross's earlier work (2002). There is also some evidence on emotion regulation and financial decision-making. Seo and Barret (2007) found that investors who were better able to identify and discriminate among their current feelings achieved superior decision-making performance. They argued that this relationship was mediated by effective regulation of the influence of feelings on their decision-making.

In the present study we go beyond the study of emotion regulation in a context of work performance that depends primarily on social interaction. In contrast to emotional labor studies, which focus on the context of interpersonal interaction, most trading nowadays (and in all cases we studied) is conducted electronically via computer or through highly abbreviated and formalized electronic messages with counterparties. Rather than depending on appropriate emotion display in the context of customer interaction or negotiating with counterparties trader performance depends on selecting optimal trading strategies in the face of complex cognitive demands and the need to process significant amounts of information with uncertain relevance (Knorr-Cetina & Bruegger 2002). We now turn to the present study.

THE STUDY AND METHODS

The data reported in this paper were collected as part of a large multifaceted study of the role and behavior of traders working in investment banks. For this paper we have returned to this data corpus to examine the considerable amount that traders told us about their work and emotion, an aspect touched on only superficially in previous analysis of this data (see Fenton-O'Creevy, Nicholson, Soane, and Willman, 2005 for an extended account of the study).

Participants

Participants were sampled from four leading investment banks with offices in the City of London. Three banks were American and one was European. Managers in each organization were asked to select a representative sample of traders from a range of markets; trading in stocks, bonds and derivatives. The mean age of participants was 32.81 years (s.d. = 4.91). There was variation in traders' experience, with overall tenure (including time with previous employers) in a range from 6 months to 30 years, and a mean job tenure of 7.80 years (s.d. = 5.58). The trader sample comprised 116 men (98.3%) and 2 women (1.7%). The participants were traders in equities, bonds and derivatives, most engaged in either market making or proprietary trading or

both. We gathered information on individual trader characteristics and performance and carried out semi-structured interviews with each trader and with a further 10 senior managers. Where traders were also managers we interviewed them twice, once as a trader and once as a manager.

Data

Qualitative data. Interviews lasted between 30 and 90 minutes. They were recorded and transcribed in full. The interviews ranged over multiple aspects of the traders' roles and work. The data set for this study consisted of the portions of the interviews relevant to the role of feelings in traders' work and decision making. Traders were asked to describe the range of emotions they experienced during trading. Follow-up questions encouraged them to explore the long-term and short-term effects of emotions on their decision making and trading strategy, the role of intuition in their trading and the impact of emotions on performance. Managers were asked to describe how they evaluated and managed trader performance. Again, this often produced talk about traders' feelings and how they were managed.

Performance data. Hard performance data for traders are difficult to obtain. Measures such as value at risk, trading outcomes and profit and loss are highly confidential in this setting and were not available to us, so we used total remuneration as our measure of trader performance. We felt this to be a reasonable proxy for decision-performance since a high proportion of total remuneration is a variable annual performance linked bonus, and the non-bonus elements tend to reflect longer term financial performance in this very performance oriented sector. We have treated this variable as an indicator of expertise, which Ericsson (2006) defines as 'reliably superior performance'. Traders were asked to state their income, including bonus, in terms of four categories (1. £50,000 - £99,999 (N = 4); 2. £100,000 to £299,999 (N = 41); 3. £300,000-£499,999 (N = 34); 4. more than £500,000(N = 38). One trader declined to provide this information.

Analysis

The raw data were the full transcripts of all interviews. We used a thematic analysis approach, which we judged to be particularly well suited to the present study. As Braun and Clarke (2006: 78) note, thematic analysis does not rest on a single epistemic position but can span both realist and constructivist approaches. We take the position that emotions have both a measurable biological reality and exist in the realm of socially constructed personal experience in which emotions have personal and social meaning.

Data were open-coded by each author separately then in discussion, using the NVIVO program. Common statements were identified and used as the basis for a first set of coding categories which were subsequently refined and consolidated. Coding categories were thus both emergent from the interviews and drew on constructs identified in the literature (e.g. approaches to emotion regulation) relevant to emerging themes. Thus coding was both theoretical and inductive. As we analyzed the data and drew tentative conclusions, we explicitly sought disconfirming evidence to test the robustness of our insights. In a later stage of analysis we partitioned the sample into groups of low (<5 years, n=25) medium (5 to 10 years, n=48) and high experience (>10 years N=45) and into groups of low (remuneration< £300k, N=45) medium (£300k- £500k, N=34) and high expertise (> £500k, N=38). We compare interview responses of three specific groups: inexperienced low paid traders (N=18), highly experienced but low paid traders (N=15) and high paid traders (N=38). The remainder of the sample were medium experience and pay. There were no low experience, high pay, traders. We chose the three comparison groups to provide maximal contrast in differentiating the characteristics associated with different levels of experience and expertise respectively.

In Table 1 we summarize our key findings and the nature of the evidence for each finding. In the final column we note our sense of the strength of the evidence for each finding. This represents a qualitative conclusion arrived at though discussion between the authors and drawing on quantity, consistency, importance and clarity of supporting data, and existence of any disconfirming evidence. In the next section of the paper we discuss these findings and the evidence for them in more detail. Direct quotes are verbatim, accompanied by the case number of the respondent and their classification in terms of experience and pay level.

TABLE 1 ABOUT HERE

TRADERS' UNDERSTANDINGS OF EMOTION IN THEIR TRADING PRACTICE

Emotional experience and regulation

For many traders, especially the less experienced, trading is marked by significant and persistent emotional responses to successes and setbacks. It is relevant to note the distinction between mood and emotion, since both were relevant to traders. Mood can be understood as a relatively diffuse emotional climate which persists over time and not anchored to specific situations or cognitions. In contrast, emotions typically have specific objects and give rise to behavioral response tendencies relevant to those objects (Totterdell, Briner et al., 1996).

> *"When you lose money you could sit down and cry. Anybody who says you couldn't isn't being honest with you. Of course when it's good, it's fantastic. The highs and lows of a trader's life are euphoria or absolute dismay."* 106: high experience, medium pay

While these emotional responses would often be triggered by specific events or series of events, in many cases the impact on mood would persist for significant periods with consequences for subsequent trading behavior. For example, one manager described a trader

working for him as "*having been in the wilderness, his confidence totally shattered*" for about two years before slowly recovering from a string of losses. Many talked about needing weeks or even months to recover from the impact of major losses, especially early in their careers. Others talked about the dangers of false confidence or euphoria which could persist for some time after a big win.

> *"People get a bit arrogant when they have good times, but this can be dangerous because then they stop thinking as much."* 18: medium experience, medium pay
>
> *"I tend to feel more cautious when losing money…If I am having a down month, I'll look at trades, which I would do if I was having a good month, and say I don't like it enough to take the risk on it. I become more selective, more risk averse and to do a trade I need to see more than one reason why a trade will work and then might put it on, but not in a huge size. When making money, I can be more slack*." 29: high experience, high pay

However, our data also suggest emotion regulation is critical to moderating the impact of emotions on traders' decision making. Senior traders and trader managers frequently talked about the way in which they had developed a capacity to regulate their own emotions and trade more evenly regardless of success and setbacks:

> *"You learn to be able to deal with emotions. It doesn't get to me as much. There were situations when I was extremely stressed up and then you feel physically ill and you really feel on the verge of throwing up. But that was a long time ago and doesn't happen so much now. You have seen the ups and downs more. You have experienced them; and in a way you are probably more prepared for it and you are aware that every now and then it will happen… but it doesn't get to you all that much because you are aware that it will happen*." 6: medium experience, high pay

We examined emotion regulation and its relevance to performance further by considering data from the three comparison groups (based on experience and pay). We noticed some important differences in the way in which these groups discussed the interaction between emotion, trading and the use of intuition. First, there seemed to be notable differences in the strategies employed for emotion regulation, which we describe below in the language of the Gross and Thompson model (2007). When asked directly about emotion, traders in the low experience group typically started by presenting themselves as fairly immune to the impact of emotion on their trading. However, as the interview progressed they would often reveal rather more vulnerability to emotions than they had claimed initially. Take for example this trader who had been trading for a little less than 4 years: -

"I'm bit of a cold fish; I don't think emotions greatly affect my decision-making. If you are making money, you are achieving your objective.…

[But later]

…When you lose money, it can be horrendous, violent mood swings. You don't know what to do when you lose money." 38: low experience, low pay

There tended to be two responses types when these traders did talk about their emotions. Some in the low experience, low pay group did not talk at all about actively managing their emotions. Others talked about removing themselves from situations when their emotions became a problem (situation modification), or avoiding situations entirely which make them feel bad (situation selection).

"I think there is a strong emotional element to trading. I think that anyone who's doing it properly and has got their head screwed on is doing everything they can consciously to overrule that, and if I feel that I'm trading emotionally I will walk off

the desk, have a glass of water, walk up and down the street and then come back and make decisions when I'm hopefully not emotional." 43: low experience, low pay

Traders in the experienced group more commonly talked about strategies for emotion regulation. However the nature of these strategies tended to vary between the low paid and high paid groups. In the high experience, low paid group, traders seemed to find it hard to articulate how they managed their emotions and the emotion regulation strategies they identified were predominately situation avoidance, situation modification and response modulation:

"If you get two or three decisions wrong you find you might not take a risk for a month until you build up your confidence. There's definitely a lot of confidence involved." 104: high experience, low pay

"I try and keep my emotions under tight control." 105: high experience, low pay

There is a marked contrast in the discourse of the high performing traders, who often showed a greater willingness to reflect on their emotion-driven behavior (the two exceptions to this were traders with whom we had only short interviews with little opportunity for extended reflection, rather than any denial of the role of emotion). Emotion regulation for these traders tended to focus mainly on how they directed their attention (attentional deployment) and how they framed experiences of loss and gain (cognitive change).

"Big losses and big gains can swap around fairly quickly and once you understand that then you stop concentrating on the loss and you start concentrating more on how to make money back. … One big trade is not going to make anyone and one big loss doesn't destroy you." 15: high experience, high pay

"Experience definitely helps, having traded through the crash etc. You've seen different scenarios and newer people it's like oh my god, it's the end of the world, whereas there is life after death and so I think that type of experience helps. It doesn't

necessarily help the new situation on what to do but it just helps your judgment." 55: high experience, high pay

There was a notable absence of avoidant behavior in this group. Several participants told stories which implied a significant degree of persistence in the face of negative emotion.

"I had one very bad year from which I learned quite a lot. I learned that the overshooting can go on for a very long time, it can be very painful; you can hit risk limits. … I did not want to get out of the trades so kept the trades and then next year they made more money than they lost. I don't think I panicked, but I was getting calls from the CEO. Reason prevailed in the end. Emotionally, it was not easy to cope with. There were times when the desk was down close to $100m, I lost almost that much in days. I was under a lot of pressure from New York because they did not understand my positions, but in the end, we managed to keep the positions and made money the next year. The hardest thing was persuading others that I had a good trade." 14: high experience, high pay

This willingness among some of the high performing traders to experience negative emotion in order to achieve longer term goals is consistent with Labouvie-Vief's (2003) argument that positive self-development requires not just strategies to optimize positive affect, but also the ability to tolerate tension and negativity to achieve long term goals.

However, there may be another important reason why response modulation strategies are maladaptive for traders. As we have seen above, while poorly regulated emotions carry over to subsequent trading and risk biasing subsequent trading behavior, emotion cues generated by reactions to information relevant to current trading under time constraints play an important role in guiding attention and rapidly choosing appropriate action. Both poor regulation of non-

relevant emotions and recourse to the attempted suppression of all feeling run the risk of masking these important cues.

The Role of Managers in Emotion Regulation

Further evidence of the importance of emotions and their regulation to trader performance came from interviews with trader managers. A few managers described their role in primarily technical terms; focusing on risk management and personal supervision of problematic trades. However, many of those we interviewed clearly saw regulating the emotions of traders who worked for them as a key element in managing trader performance:

> *"I have to play the role of director of emotions in the sense that when they are down you have to boost their morale and when they are too excited they want to do stupid things, I have to cool them down"* 119: senior manager
>
> *"I care deeply because I have tremendous pride in the people here…The stress is generated by fear entirely and it's fear of what? I guess everyone has their insecurities whether it's being fired, losing lots of money and appearing stupid in front of their peer group. Whatever it is it's definitely fear and if you can take the fear out of the situation they perform better."* 123: senior trader manager, high experience, high pay

Many traders described such episodes of managerial intervention as crucial to their learning and development. For example:-

> *"I lost $1m in the first 10 days of the year. This was at a time when if you made $1m in a year, that was huge. I was devastated and my boss asked me for lunch at the weekend - I thought that was the end of my career. My boss said 'a lot of the guys think you're OK, but they are worried you are going to be afraid to trade, that you're*

going to be gun shy and lose your confidence. We want you to know that we like you and if you think you've got to buy them, buy them and if you've got to sell them, sell them but whatever you do don't stop trading.' So that was a huge relief. Since then, I don't get too depressed about losing money, although there are always good days and bad days." 25: low experience, medium performance

Other managers clearly gave thought to the relative strengths and weaknesses of more intuitive versus more analytical traders in their decisions about matching traders to roles: -

"A gut trader should trade a liquid market - he might change his feel so he needs to get out. The analytical trader who thinks much more about what he's doing will change their mind less often, and trade with a different time frame. A gut trader can be bullish in the morning. The analytical trader will look at something for a week and then put on a position - less important to get in and out. He doesn't need to be in a liquid market - in an emerging market you need a more analytical trader." 122, Manager

"Derivatives are very quantitative and people think if you have a PhD you will be very good because you have an understanding of options theory, but this is not always the case and you tend to overlook things. Although you can put the parameters into the model, there are still a lot of things which are uncertain. Sometimes adding a more qualitative feel to it –'yes that's what the model says, but the risk doesn't look right'. ... I tend to have a mixture of people on the desk - those who are more quantitative and those who are more common sense or gut instinct traders. Having the blend is quite useful for bouncing ideas." 124: Manager

These reflections have implications for management strategies in trading environments, or indeed any others where the main role of the operative is complex decision-making under

constraints of time and uncertain and incomplete information. We consider these points further in our discussion.

Emotional Cues and the Use of Intuition

The second broad theme concerned the role of emotional cues in traders' decision-making. Many of the traders discussed this aspect of emotion as intuition. Traders' own accounts and conceptualizations of intuition fit well with Dane and Pratt's (2007;40) definition of intuition as "affectively charged judgments that arise through rapid, non-conscious and holistic associations". For example: -

> *"[W]ithout a doubt, some of the best bargains are the ones you don't do! You know they're bad bargains. You know. It's a gut feel. You've looked at the playing field and you just know this is a bad bargain."* 106: high experience, moderate pay

Some of the traders see a more subtle and sophisticated role for emotions, which represent an unconscious drawing on experience: -

> *"I think many people do say they're gut-feel traders but perhaps they're not analyzing what they're actually thinking and they're seeing a lot of customer flow and a lot of buyers and they probably don't necessarily realize the reasons why they want to buy. But there are very good traders that say they're trading off gut feel that I believe actually have probably reasonable information, reasonable thoughts behind it but they wouldn't literally toss a coin"* 55: high experience, high pay

Feelings are also seen as a kind of radar, directing attention and shaping perceptions around opportunities, to enable them to be promptly seized.

> *"I think what a trader has to have is not necessarily this gut feeling but this nose for opportunities. If an opportunity comes along you have to be able to spot it and see it*

and sometimes people you typically find in this business - an opportunity is there and they can't see it and then it's taken by someone else and it's like oh yeah, that was a good idea but it is gone." 58: high experience, low pay

Not only do feelings act as a kind of radar directing attention but they do so in a way that enables rapid decision making under time pressure. As one trader noted: -

"Trading includes stuff which is beyond trading. Trading is when you make decisions involving financial risk that have two qualities: you have to make them in someone else's time schedule, not your own and when you make a decision you have to be confident when you have incomplete or imperfect information and therefore there must be some kind of intuitive or qualitative element." 121: high experience, high pay

Experienced traders made much more reference to intuition, or 'gut feel' as they often phrased it, than less experienced traders. However, again, there were important differences between low and high paid traders in the high experience group. Low paid traders who talked about the use of intuition often talked of it in terms of a rather mysterious process. You either had a feeling or not. For example:

"It's almost like a sixth sense. Something comes over you and you feel like - yes I know they're going to be looking to buy these later on or looking to sell these later on." 116: high experience, low pay

By contrast the top paid group tended to reflect critically about the origins of their intuitions and to bring them together with more objective information: -

"If I do fancy a stock - you have a feeling, it feels right, it has done nothing for like two or three months and you've seen sellers and they start to dwindle and it is just stagnant and then you have a look on the charts, you refer to the technical side as well as the emotional side of the trade. So you know a combination of technical and

> *emotional as well as what the analyst thinks, as well so you sort of bring the instruments you have available to you to make the decision rather than the snap* [snaps his finger] *I fancy buying that."* 101: high experience, high pay
>
> *"I may examine opportunities based on intuition that something is going to happen, but the decision is based on something I think is rational."* 68: medium experience, high pay.

Reported use of intuition does seem to increase with trader experience. However, traders' engagement with their feelings is qualitatively different between low and high performers. High performing traders seem to engage with their intuitions at a meta-cognitive level and make judgments about the relevance of these feelings to the decision at hand. This is consistent with the growing literature on expertise which points to experience as a necessary but insufficient condition for the development of expertise and points to the role of extended critical engagement with practice in developing expertise (Ericsson, 2006; Ericsson, Krampe, & Tesch-Roemer, 1993).

Traders were not universally positive about the role of intuition in market decision making. Some believed reliance on such feelings yields poor outcomes: -

> *"Many traders feel that models have been developed by academics who do not know markets and* [traders] *think that gut feeling is more important. My experience is that this is 100% wrong and computers can make better decisions than traders."* 37: medium experience, medium pay

Overall, however, the data support a picture of expert traders having a meta-cognitive engagement with emotion regulation. This process entails discrimination between emotions in terms of their relevance to the decision at hand and effective strategies for emotion regulation to enhance performance.

Empathy

The third identified theme was empathy: monitoring own emotions as information about what other market players might be feeling. Only five traders explicitly described using their own capacity for empathy as a decision making tool. Although not frequent in our data, these examples are important, illustrating that there is a path for traders beyond simply seeking to eliminate or reduce the intensity of their emotions. These traders fostered feelings as a source of information about other market actors which they managed and used in a self-aware analysis. One trader described using his own fear as an indicator of fear in the market. Another described actively imagining the feelings of other market actors: "*trying to put myself in* [the Bank of England Governor's] *feet to develop a feel for how he feels and thinks*" 14: high experience, high pay.

Three traders talked about an emotional affinity with the feelings of people in national markets (Spain 34: high experience: medium pay; Italy 70: medium experience, low pay; and Japan 117: high experience, medium pay) with whom they shared a common culture and propensity to react emotionally in similar ways to the same market events. This group was small, but these data broaden the picture of traders 'reasoning with emotion', and offer a potentially rich and fruitful avenue for future research.

DISCUSSION AND CONCLUSIONS

To ask whether emotion disturbs or aids traders' decision-making is to ask the wrong question. Traders' emotions and cognition are inextricably linked. Therefore a more productive question to ask in this context is whether there are more or less effective strategies for managing and using emotion in financial decision-making. This has been the thrust of our analysis, which

sought to move beyond previous work that simply characterizes emotional arousal as detrimental to performance (e.g. Lo et al., 2005; Schunk and Bersh, 2006). The study contributes to our understanding of the role of emotions in work and decision-making in several distinct ways. In contributing to our understanding of the role of emotion at work, this study has particular relevance in that it considers a work domain which has been theorized as strongly normatively rational as opposed to a work domain (such as negotiation or customer service) where performance is primarily dependent on effective social interaction. However, it is clear from this study that even within such an analysis-intensive domain as financial trading emotion plays a central role. Traders and their managers are frequently preoccupied with the effective regulation and use of emotions in their work. Our work points to the value of a more nuanced understanding which considers the role of emotions in decision-making, the differential impact of various emotion regulation strategies, the conditions under which 'gut-feel' may support effective decision-making and the role of empathic responses in understanding the behavior of other market actors.

Effective emotion regulation seems to be a critical success factor in trading, for our findings suggest that the strategies for emotion regulation adopted by expert, higher performing traders are qualitatively different from those of lower performing traders. In particular, higher performers are more inclined to regulate emotions through attentional deployment and cognitive change and may display a willingness to cope with negative feelings in the interests of maintaining objectivity and pursuing longer term goals. The kind of attention and appraisal-focused emotion regulation strategies used by high-performing traders do not seem to be too cognitively expensive and are effective in reducing negative experience of emotion (Gross, 2002). By contrast, less expert traders engage either in avoidant behaviors, such as walking away from the desk, or invest significant cognitive effort in modulating their emotional

responses. This extends previous findings (e.g. Grandey 2003) concerning the performance benefits of antecedent versus response-focused emotion regulation in the context of emotion labor to the very different context of financial decision-making. Our findings also suggest that willingness to endure negative feelings in pursuit of long-term goals may be more adaptive than purely defensive strategies aimed at maintaining positive feelings (Labouvie-Vief, 2003; Tamir, 2005).

This study also provides evidence that more effective emotion regulation strategies can be learned in a financial decision-making context. While an individual's preferred approach to emotion regulation is likely to be influenced by personality traits, neuroticism and extroversion in particular (Gross & John, 2003), our interviews with traders and their managers also point to the importance of traders' learned strategies for emotion regulation. Importantly our study also suggests that defensive emotion regulation strategies may be problematic because they reduce opportunities to exercise expert intuition.

These findings go well beyond prior research on emotion regulation and performance (e.g. Grandey 2003), which has a primary focus on performance in the context of interpersonal interaction. Our findings uniquely address the performance of professional traders for whom performance is not primarily dependent on interpersonal interaction, and which has been theorized as strongly rational, involving the selection of optimal strategies in the face of complex cognitive demands, and requiring attention to a large volume of information with uncertain relevance.

Turning to intuition, traders in our study mirror the balance of opinion in the research literature on intuition. They are equivocal about whether feelings and hunches about appropriate courses of action lead to better or worse outcomes than purely rational analysis. There were strong feelings on both sides, with traders being quite evenly divided between the two camps.

However, again our study suggests the importance of a more nuanced approach than simply asking whether reliance on intuition is good or bad, and points towards the conditions in which reliance on intuitive judgment may be more and less effective. The findings suggest that one characteristic of higher performing traders may be a greater willingness to reflect critically about their intuitions and feelings about trading. These traders often reported relying on intuition, but they tend to weigh their feelings critically alongside other evidence and to reflect about the provenance of those feelings. Lower performing traders may rely on feelings alone, and show less propensity to think critically about the source of hunches. This reflection by expert traders about the provenance of feelings may be particularly salient given Schwarz and Clore's (1983; 2003) finding that the impact of emotions on behavior is reduced or disappears when the relevance of those emotions is explicitly called into question.

That traders' reliance on affective cues in decision-making can support effective performance is consistent with Damasio's observation that deciding advantageously depends on the use of affective cues in both learning and deciding (Bechara et al., 1997; Damasio, 1994). There is increasing evidence that humans are naturally proficient in the ability to acquire expertise and that encapsulation of experience in expert intuition and perception via system one provides a means of by-passing cognitive limits (Ericsson, 2006). The nature of expertise could counteract the inherent environmental uncertainties that Tiedens and Linton (2001) identified as leading to more conscious appraisal of information. While not an unequivocal result, our finding of greater critical engagement among higher performing traders with intuitions and their more sophisticated deployment of intuition, in combination with analysis, suggests an important direction for future research.

The small number of accounts of traders monitoring their own emotions as a source of information about the emotions of other market actors was intriguing. These data suggest a

possibly productive avenue for future research. We do not have evidence of performance outcomes of predictive uses of empathy in this manner, but our findings are consistent with arguments that the evolution of the human brain has been significantly driven by the need to predict the behavior of other humans, often via subtle cues (e.g. Nicholson 2000).

We suggest that the identification of links between decision-making performance and emotion regulation in this study has important implications for theory development in two key fields. First, while somewhat tacit in much of the literature, the implication of many claims in the decision-making and behavioral finance literatures is that a range of key decision-making biases are underpinned by mechanisms which involve emotion processes. One relevant explicit example is Thaler's (1985, 1999) account of the role of 'hedonic editing' in mental accounting and the disposition effect (the tendency to hold losing assets longer than winning assets). This explains key biases in terms of the desire to maintain positive hedonic tone. There is evidence too of interpersonal variation in propensity to exhibit such biases, for example, investors vary in their propensity to exhibit the disposition effect (Shapira & Venezia, 2001; Weber & Welfens, 2008). In this study we have seen that traders seek to regulate emotions in order to avoid decision biases, and that higher performing traders typically exhibit more sophisticated emotion regulation strategies. This suggests that it would be productive to investigate the role of emotion regulation as one key source of interpersonal variation in susceptibility to a range of decision biases.

A second implication concerns the role of emotion in expert performance. While much attention has been paid to the nature of cognition in expert performance, the expertise literature hardly considers the role of emotion. For example, examining the index of the Cambridge Handbook of Expertise and Expert Performance (Ericsson et al, 2006) reveals very few references to emotion; and these are peripheral to the main arguments of the chapters which contain them. Our research suggests, first, that effective emotion regulation may be an important

facet of expert performance and, second, that greater attention should be paid to the interactions between emotion, emotion regulation, and expert intuition. Further research could test the proposition that effective expert intuition is reduced by reliance on defensive emotion regulation strategies.

While our study points to the importance of intuition in traders' work, it may be that the relative importance of intuition and analysis vary with task characteristics such as time span of decision-making. Certainly this seemed to be the view of several senior managers with responsibility for allocating traders to trading roles. The interplay that expert traders described between intuition and analysis is also intriguing. The importance of context to the role of affect in decision-making has been noted in prior research (Forgas & George, 2001). Further research could usefully explore this aspect of traders' expertise.

This study also contains some potentially important implications for practice. First, it points to the importance of learned strategies for emotion regulation and the need for effective support for their development. Second, our data directly and indirectly point to the key role of management in this process. Our findings suggest that there may be considerable benefits to skilled managerial interventions that help to steer effective emotion regulation and support inexperienced traders in developing emotion regulation skills. Additionally, managers may be able to help traders to understand the productive role that critically engaged, experience-based, intuition may play in decision-making. Our evidence suggests that many high performing traders deploy a reflective and critical approach to the use and development of intuition, well-founded in experience. Managers could help to guide this process through coaching. The contextual dependence of high quality intuitions suggests they are quite domain specific and may not transfer across contexts. As several informants told us, this is especially true for traders operating under different market conditions.

We heard repeated concerns from senior managers who worried about traders who had not seen a bear market and would not operate well when that occurred. We also heard many stories of people transferring between trading areas and needing time to re-contextualize expertise before their intuitions could be considered reliable. Thus managers have a role in helping traders to extend the boundaries of their expertise. Given recent events in financial markets, our findings may be relevant to an understanding of how traders react under massively changed trading conditions and how those reactions might either contribute to or result from market volatility.

This research has some important limitations. First, although we have argued for the importance of an account of emotion that includes the experience of emotion, as Pham (2004: 368) notes, the affective system is focused on the present. Thus people can be poor at recalling or predicting emotions. There are limits to the human capacity to introspect on emotion processes and to recall the experience of emotion. These limits are also subject to wide individual differences. The capacity for introspection and recall will also vary between individuals. For this reason studies such as ours need to be complemented with more physiologically based research as well as further qualitative and quantitative studies.

Second, as in all work contexts, traders subscribe to norms of socially sanctioned behavior and to common narratives about the nature of their work. We have not treated emotional labor as a primary component of traders' work and performance. The majority of work interactions are carried out through highly abbreviated electronic exchanges which provide a poor medium for the communication of emotion. However, there is a sense in which traders engage in emotional labor since, especially for novices, there are social pressures to comply with display rules which emphasize the avoidance of displays of strong emotion. One common narrative thread that ran though many traders' accounts of their work was a representation of trading work

as principally concerned with rational analysis from which emotions are a dangerous distraction. This narrative seemed particularly strong in the accounts of less experienced traders. Although, as we have seen, the mask would often slip as they discussed their work. Some traders' accounts were clearly colored by a desire to conform to this mode of self-presentation. In consequence it is possible that in our interviews and during data analysis we were at times unable to distinguish effectively between defensive denial of emotion and effective regulation of emotion. This would be another avenue for future research.

To conclude, we know that emotions are a rich source of experience in everyday life, but at the same time in work contexts they can be a source of vulnerability, a wayward influence over judgment, and a source of disturbance to process. The more "rational-economic" such environments are, the more likely we are to hold such beliefs (Nicholson, 2000). Our research illustrates that this position is false or, at best, short-sighted. In the hyper-rational world of trading in financial markets we did find some evidence that emotions disturbed performance, but mostly among the inexperienced and un-reflective traders. The best traders are able to regulate emotions effectively, and incorporate relevant emotions as information – signals, or a kind of radar that contain information about risks, what is going on in the minds of others, and the weight and relevance to be accorded to one's own past experience.

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TABLE 1: Summary of key findings and supporting evidence

Theme	Nature of evidence	Strength of evidence
Detrimental effect of non-relevant emotions: Mood swings induced by prior trading outcomes are a significant (detrimental) factor in traders' decision-making	The majority of interviewees stressed the importance and difficulty of managing their emotions and mood following large gains or losses. A minority claimed to have no difficulty at all. These seemed to fall into three groups. A small number who consistently claimed to be constitutionally unemotional, a larger group of (mostly inexperienced) traders who seemed concerned to present themselves as adhering to an ideal type of the 'unemotional trader' but talked at times in ways which undermined this self presentation; and more senior traders who presented a narrative of overcoming the influence of mood on their decision-making through hard won experience. The data shown in the results section are representative of the range of emotional expression	Strong
Emotion regulation and performance: There are marked differences in emotion regulation strategies between inexperienced traders, experienced low performing traders and experienced high performing traders	Clear differences in description of emotion regulation strategies emerged between novice traders, experienced low performers and experienced high performers. There was a high level of agreement about these differences between different authors coding separately, and there were few counter examples.	Strong
Managers and emotion regulation: Trader managers play an important role as regulators of traders' emotions	Not all managers in our sample saw themselves as having a role in managing traders' emotions. However, stories about the role managers played in managing traders' emotion were a frequent component of traders' and managers' accounts of emotions in trading.	Moderate

	There were no specific counter examples although not all managers talked about their role in managing emotions.	
Intuition: **Affectively cued intuitions play an important role in traders decision-making**	Traders talk often contained references to the use of intuition. Their language in relation to the use of intuition often had a visceral component or related to feelings. They talked of 'gut feel', 'having a nose for', 'it's like having whiskers', 'it just felt right', 'the risks felt wrong'. There was considerable variation in what individual traders claimed about their personal reliance on intuition with a roughly even split between those who claimed to rely on intuition a great deal and those who claimed to use it little or not at all. However, nearly all felt it to be an important element of decision making for many traders. Opinions also seemed split between those who felt intuition and associated feelings to be a valuable aid, and those who felt them to lead to bad decisions. The data shown in the results section are representative of the available range.	Strong
Intuition and performance: Differences among experienced traders between low and high performers in 'critical engagement with intuitions'.	Experienced high performers were no more or less likely to report relying on intuition than experienced low performers. However, experienced high performers were more likely to report reflecting critically about the origins of their intuitions and to report bringing them together with other more objective sources of evidence. There was reasonable agreement among authors coding separately. There were a few counter examples.	Moderate

Empathy: **Self-monitoring of emotion as a basis for understanding and predicting emotions of other market actors can be a factor in traders decision-making**	Five traders (of 118) explicitly and spontaneously described using their own emotions as a source of information about the likely emotional state of other market actors. There were no specific counter examples, however, these data were emergent so there were only a few examples of empathy.	Sporadic, emergent