

Index Game Feedback Report

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Disposition effect background

In trading, several biases have detrimental effects when trying to maximize financial earnings. One common bias is the *disposition effect*, defined as the individual tendency to hold on to assets that have lost value for too long and sell assets that have gained value too early. At the Trader Expo 2011, participants received the unique opportunity to engage in play testing of this newly designed tool to measure the disposition effect. The Index Game is a novel game that is being developed within the pan-European xDelia-research consortium.

In the Index Game, participants engage in a general trading simulation. The game consists of two phases. In the first phase, participants are diagnosed as to whether or not they show the disposition effect. In the second phase, players receive information on the disposition effect, and are provided with a disposition effect meter so individuals can learn to reduce the disposition effect. Because of some technical issues with the newly designed game, not all participants completed the second phase.

Prior to playing the Index Game, you were randomly assigned to receive mindfulness instructions (i.e., pay attention to your breathing) or control instructions (introduction to the Index Game) because there is emerging evidence that mindfulness can help individuals regulate emotions which can be beneficial for trading. You also provided saliva samples before and after the Index Game to measure changes in testosterone and cortisol levels, two hormones previously implicated in financial decision-making and emotion regulation/stress.

General Results

Mindfulness: The mindfulness manipulation did not affect the disposition effect specifically. However, there was a trend for participants who received the mindfulness instructions to have greater overall earnings than participants in the control condition. Moreover, mindfulness instructions increased testosterone and decreased cortisol levels during the Index Game, a hormone profile previously associated with profitable trading and rational decision-making. This hormone profile is also associated with reduced emotionality/psychological stress, suggesting that a mindfulness-based approach may be beneficial for traders because it helps traders regulate emotions and buffers against physiological stress during trading.

Figure 1. Screenshot of the Index Game



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Individual feedback

Disposition Effect. The first phase of the game produces a diagnostic value of the disposition effect coefficient (DEC). This value is in the range between -2 and 2. When the DEC is positive, then this indicates that individual tends to hold on to losing assets longer than winning assets, with values closer to 2 indicating a stronger tendency toward this bias and values closer 0 indicating a weaker tendency. Most individuals have positive DEC values, but some people actually show the reverse of the disposition effect, which is the tendency to hold on to winning assets longer than losing assets. Value between -2 and 0 indicate a reverse disposition effect, with numbers closer to -2 indicating a stronger tendency towards the reversed disposition effect and values closer to 0 indicating a weaker tendency.

In the second phase of the Index Game, you received instructions on what the disposition effect is and saw a meter that tracked your disposition effect. Not everyone was able to play the second phase due to technical problems during game play. On average, people showed a significant reduction in the disposition effect in the second phase compared to the first phase.

In your case, you obtained a value of **-0,73** for the disposition effect coefficient in the first phase, and a value of **-1,03** for the disposition effect coefficient in the second phase. The mean disposition effect across all 45 people who participated in the study was 0,42 for the first phase (Standard Deviation = 0,86) and -0,01 in the second phase (Standard Deviation = 0,68). We suggest that you first evaluate your scores for the type of bias you tend to show (do you show a disposition effect, reverse disposition effect, or little to no bias?). If you would like, you can also

evaluate your scores in comparison to other traders in the study by taking into consideration both the mean and the standard deviation (e.g., about how many standard deviations from the mean did you score?).

Hormone Changes. We analyzed your saliva samples for changes in testosterone and cortisol levels. Positive values indicate a rise in the hormone, whereas negative values indicate a drop. You showed a change in testosterone score of **-10,97** picograms/milliliter and a change in cortisol score of **-7,04** micrograms/deciliter. Notice how the units are different so you should not directly compare your testosterone and cortisol scores. The mean testosterone change score was 0,22 (Standard Deviation = 26,39), and the mean cortisol change score was -0,91 (Standard Deviation = 3,70). Use this information to determine how extreme your hormone change scores were (how many standard deviations above or below the mean did you score?) Rising cortisol is associated with psychological stress and emotionality, whereas decreasing cortisol is associated with psychological relaxation. Rising testosterone is associated with greater profitability during trading overall, although it has been noted that in some trading contexts rising testosterone can lead to overly risky financial decision-making. In recent research a profile of increasing testosterone and decreasing cortisol has been associated with higher profits and more rational decision-making. The field of neuroeconomics is only in its infancy, so we suggest you do not read too much into these hormone changes to make strong inferences about your trading style. However, it is becoming increasingly clear that biological changes do influence trading behavior and that people have indirect control over these changes through their thoughts, feelings, and behaviors. For example, in this study a short mindfulness exercise prior to trading altered testosterone and cortisol changes during the Index Game.