Buy and Sell Preferences in Financial Markets: Laboratory Experiments Investigating Influences of Anticipatory and Anticipated Emotions

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Abstract

Research on emotions in financial markets includes studies of effects of mood proxies (e.g. weather) on market performance, field studies measuring investors’ emotions, and laboratory tests of emotion influences on investor decision making. A general account of emotion effects in financial markets is still lacking. We report a first step in this direction by proposing how anticipatory and anticipated emotions interact in accounting for investors’ buy and sell preferences. We argue that this is the level that needs to be examined to understand the influences of emotions on financial markets. In partial support of our emotional account we present the results of 3 experiments employing naïve undergraduates who report anticipatory hope versus fear and anticipated elation versus disappointment due to changes in fictitious stock prices. We find that sell preferences tend to be positive both after price increases and price decreases if the balance of anticipated elation and disappointment exceeds the balance of anticipatory hope and fear. Our claim is that sell preferences formed in this way are invariant inputs to the decision making process that result in sell choices, but that experienced and sophisticated investors are able to control the impact of emotions. In naive investors the decision process is instead short-cut such that emotions play a larger role.

Key words: Emotion; Financial market; Naïve investor; Preference
Introduction
Emotions have historically played a minor role in decision-making research. About two decades ago this started to change (Peters et al., 2006; Weber & Johnson, 2009), importantly due to influences from the neuropsychological research by Damasio and collaborators (Damasio, 1994). We consider this to be a desirable development since, as argued by among others Forgas (1995), Loewenstein (1996), and Schwarz (2000), the influences of emotions on judgment and decision making are ubiquitous and not necessarily irrational. The same argument related to financial decision making is made more recently by Pham (2007), Rick and Loewenstein (2008), and Hirshleifer (2015). A recent empirical assessment of the important role of emotions in judgment (and by implication in choice) is reported in Greifeneder et al. (2011). Empirical studies of influences of emotions on decision making are recently reviewed in Lerner et al. (2015) and Phelps, Lempert, and Sokol-Hessner (2014).

Our claim elaborated on below is that emotions are an invariant input to a deliberate investor decision-making process in financial markets, but that investors’ experience and sophistication override or moderate the impact of emotions. This complex interaction of emotion, cognition, and decision making at play in financial markets needs to be a focus of behavioral finance research if the aim is to understand heterogeneous investors’ behaviors.

In this paper we first introduce a classification of emotions. Then we present an emotion account of naïve investors’ buy and sell preferences in asset markets. This is followed by a report of three laboratory experiments. A final section discusses the results and outlines some future research directions.

A Classification of Emotions
In this section we present a classification of emotion-related phenomena by drawing on basic emotion research (Rick & Loewenstein, 2008; Västfjäll & Slovic, 2013; Volz & Hertwig, 2016). Emotions may be experienced as a consequence of the outcome of a choice. Emotions may also precede and influence a choice. We introduce three related, less inclusive distinctions; evaluations versus emotions, incidental versus integral emotions, and anticipatory versus anticipated emotions.

Evaluations versus emotions
An outcome of a choice is normally perceived to have an affective quality (e.g., good, bad or neutral) (Russell, 2003). We refer to this as an evaluation of the choice outcome, but an evaluation as bad or good does not necessarily elicit an emotional response. According to several emotion theories (e.g., Carver & Scheier, 1990; Lazarus, 1991; Oatley, 2009), this will occur if and only if the outcome has personal relevance, for instance if it is perceived to facilitate attainment of a personally positive consequence or prevent the occurrence of a personally negative consequence.

In what follows we draw on the psychological construction theory of emotions proposed by Russell (2003, 2014). This theory posits that core affects are elemental building blocks involved in all emotional responses or states. More precisely, a core affect is a “neuropsychological state consciously accessible as the simplest raw (nonreflective) feelings evident in moods and emotions” (p. 148). Core affects are always consciously accessible, either being neutral or having any other value in a dimensional system defined by the axis pleasure-displeasure and activation-deactivation. Several different methods to measure core affects (self-reports, peripheral physiology, startle responses, face expressions measured as electric muscle potentials [electromyography or EMG] or classified from video recordings by means of automated pattern recognition systems, and measures of brain activity including electrophysiological methods such as electroencephalogram [EEG], neuro-imaging with fMRI or positron emission tomography [PET]) support a dimensional description although all the
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methods do not converge on the two dimensions of pleasure and activation (or arousal) (Mauss & Robinson, 2009). Approach-avoidance has been proposed to be a third dimension. Yet, this dimension is found to be a function of valence and activation (Mehrabian & Russell, 1974; Västfjäll et al., 2001). Another criticism (e.g. Lazarus, 1991; Lerner et al., 2015) is that emotions are discrete. A counter-argument is that discrete emotions may be conceptualized as combinations of multiple dimensions. The two-dimensional system of pleasure-displeasure and activation-deactivation referred to as the affect grid is illustrated in Figure 1 (Russell, 1980; Yik et al., 2011), also showing discrete emotions located along the periphery of the circle. Direct corroborations by neuro-imaging data are reported in Posner et al. (2009) and Wilson-Mendenhall et al. (2013).

Incidental versus integral emotions

An unrelated emotion state such as mood affecting a choice is considered to be incidental because it is nominally unrelated to the choice. It may still affect pre-choice information processing (Isen, 2000; Schwartz, 2000; Schwartz & Strack, 1999). Whereas mood is an incidental emotion, an emotional response to a choice outcome is an integral emotion. The distinction between emotional response and mood is however somewhat unclear to lay people and researchers alike (Beedie, Terry, & Lane, 2005). Language is also a fallible source for making the distinction. The similarity of emotional responses and moods is consistent with Russell’s (2003) claim that mood is a prolonged core affect, also emphasizing that moods are less transient than emotional responses. Emotional responses are furthermore frequently stronger, thus would more likely occupy the conscious focus with moods residing in the background (Lazarus, 1991). Gärling et al. (2015b) note that in general emotional responses may result in changes in mood that linger after the transient changes caused by the emotional responses have dissipated. A good-bad evaluation of a personally relevant experienced choice outcome is thus likely to elicit an emotional response, which to some degree changes mood in a positive or negative direction.

The bulk of emotion research in financial markets (e.g., Hirshleifer & Shumway, 2003; Lucey & Dowling, 2005) appears to target incidental mood effects. If recognizing that emotional responses to choice outcomes change mood (Gärling et al., 2015b), mood effects are however not necessarily unrelated to choices. Field studies of trading in asset markets (e.g. Fenton-O’Creevy et al., 2012; Lo & Repin, 2002; Nguyen & Noussair, 2014; Seo & Feldman Barret, 2007) probably measure emotional responses to choice outcomes as well as lingering mood changes due to the emotional responses. In the following we refer to mood effects of choice outcomes as anticipatory emotions provided that they are attributed to the choice outcomes that elicit the emotional responses.

Anticipatory versus anticipated emotions

Anticipatory emotions\(^1\) are associated with an unspecified event or series of events when people think about what may happen in the future. In the context of financial outcomes hope of earning and fear of losing would qualify (Lopes, 1987). Investor sentiment of optimism and pessimism are similar anticipatory emotions recognized in financial markets (Nofsinger, 2005; Tetlock, 2007). In the neuropsychological research by Bechara, Damasio, and Damasio (2000), the Iowa Gambling Task is used to investigate choices between decks of cards (sequences of choices) that either are associated with a higher volatility such that the frequencies of large losses and gains are higher than in other decks associated with less volatility. Anticipatory fear indexed by a physiological marker, such as the skin conductance

\(^1\)Note that Rick and Loewenstein’s (2008) “immediate emotions” is similar to what we refer to as anticipatory emotions.
response, is more strongly influenced by choices of the former decks than of the latter decks. A demonstration in a financial context is reported by Shiv et al. (2005).

Anticipatory emotions differ from anticipated emotions. In contrast to the former, anticipated emotions are associated with specific choice outcomes (Lerner et al., 2015; Loewenstein et al., 2001; Mellers, 2000), for instance the degree of anticipated elation that may vary with the size of gains or the degree of anticipated disappointment that may vary with the size of losses. Anticipatory and anticipated emotions may furthermore differ in quality, in our emotion account to be described next, anticipatory hope and fear versus anticipated elation and disappointment. Anticipatory emotions are felt, whereas anticipated emotions are cognitive representations that are activated in the pre-choice process. Yet, both have been shown to have the same conscious elements of core affects (Västfjäll et al., 2004).

An Emotion Account of Buy and Sell Preferences

Next we present an emotion account of buy and sell preferences drawing on the distinctions we made in the immediately preceding section between anticipatory and anticipated emotions. We specifically propose that investor decision making is influenced by (1) price movements changing anticipatory emotions of hope of earning money and fear of losing money (Lopes, 1987; Nofsinger, 2005; Shefrin and Statman, 2000), and (2) price movements changing anticipated emotions of elation associated with choices to realize gains and anticipated disappointment associated with choices to realize losses (Loewenstein et al., 2001; Mellers, 2000). Our emotion account does not exclude the possibility that factors unrelated to price movements may change an individual’s (pleasant-displeasant) mood that also has impacts on buy and sell preferences.

We further propose that hope-fear varies along an axis at a 30-degree angle to the main axes in the affect grid (see Figure 2), whereas elation-disappointment varies along an axis at a 30-degree angle to the hope-fear axis. When moving from one end-point to the other end-point on the continuum, hope increases at the same rate as fear decreases, or the reverse, such that \( \text{Hope} = - \text{Fear} \). Likewise, when elation increases, disappointment decreases at the same rate, or the reverse, such that \( \text{Elation} = - \text{Disappointment} \).

Our basic proposition is that emotions changing with price movements determine preferences to buy or sell. Emotions may influence all investors. Yet, preferences to buy or sell are only one input to a deliberate decision-making process resulting in buy or sell choices. In less experienced and sophisticated investors, the decision process is likely to be short-cut such that emotions play a larger role (Finucane et al., 2000; Kempf et al., 2013). Whether buy and sell preferences result in an actual choice also depends on the availability of other investors willing to sell or buy.

For a single asset we hypothesize that it is not purchased unless anticipatory hope exceeds anticipatory fear. When the price increases, anticipatory hope and anticipated elation increase and anticipated disappointment decreases linearly at the same rates. Conversely, when the price decreases, anticipatory hope and anticipated elation decrease and anticipated disappointment increases linearly at the same rates. In contrast, anticipatory fear decreases linearly at a lower rate above the purchase price and increases linearly at a higher rate below the purchase price. As the upper graph in Figure 3 shows, this results in that above the purchase price the difference between anticipatory hope and fear increases at a lower rate than the difference between anticipated elation and disappointment does, and that below the purchase price the difference between anticipatory hope and fear decreases at a higher rate than the difference between anticipated elation and disappointment does.

\( ^2 \)The linear functions may be replaced by, for instance, concave power functions with no consequence for the following reasoning.
Investors with anticipatory emotions of hope exceeding anticipatory emotions of fear may be attracted to purchase assets when price increases (Baker & Wurgler, 2007; Kubinska et al., 2012). Purchasing assets evokes anticipated feelings of elation moderated by anticipated feelings of disappointment. This is illustrated in the upper graph of Figure 3 for the single asset assuming some lag before anticipated elation exceeds anticipated disappointment. We hypothesize that when elation exceeds disappointment a preference to buy is formed.

As shown in the lower graph of Figure 3, a sell preference is proportional to how much the difference between anticipated elation and disappointment exceeds the difference between anticipatory hope and fear. This implies that sell preferences are positive both when the price increases (the elation-disappointment difference being more positive than the hope-fear difference) and when the price decreases (the elation-disappointment difference being less negative than the hope-fear difference). Even though anticipatory hope exceeds anticipatory fear, a stronger anticipated elation exceeding anticipated disappointment is preferred, and, conversely, a stronger anticipated disappointment exceeding anticipated elation is preferred to a stronger anticipatory fear exceeding anticipatory hope (Västfjäll & Gärling, 2006).

Experiments

In order to provide support for the emotion account, we conduct three laboratory experiments investigating sell preferences in a fictitious stock market employing as participants undergraduate students with limited knowledge of stock markets. We test the hypotheses that for upward price movements, the sell preference changes from negative to positive when the positive difference between anticipated elation and anticipated disappointment exceeds the positive difference between anticipatory hope and anticipatory fear, and that for downward price movements, the sell preference changes from negative to positive when the negative difference between anticipated elation and anticipated disappointment is less negative than the negative difference between anticipatory hope and anticipatory fear.

Experiment 1 is an initial pilot study in which participants are asked to imagine how strongly they would feel anticipatory hope, anticipatory fear, anticipated elation, and anticipated disappointment in order to sell or not sell a stock lot when the price increases and when the price decreases. In Experiment 2 participants are presented with an increasing price and in Experiment 3 with a decreasing price of a fictitious stock that they imagine having purchased. The participants rate how much they hope that the stock price increases or fear that it decreases, how elated or disappointed they anticipate they would feel with selling the stocks, and whether or not they would sell if feasible.

Experiment 1

Participants and Procedure. Thirty psychology undergraduates (19 women, mean age 29.57 years, standard deviation 12.07 years) at University of Gothenburg (Göteborg), Sweden, are recruited in classes to fill out a booklet immediately after a lecture. Each session lasts for approximately 5 minutes and is monitored by a female research assistant. Participants do not obtain any form of compensation.

On the first page of the booklet participants are asked to imagine that they have inherited a sum of money for which they purchase 1,000 stocks at the price of SEK 250 (about USD...
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24.0) in a successful company. They are told that their motive for purchasing the stocks is to earn a profit by quickly selling at a higher price.

On single pages in the booklet appearing in counterbalanced orders, one of the following questions (referred to as conditions I to IV) is presented: (I) If the price decreases, how would you feel in order to not sell the stocks?; (II) If the price increases, how would you feel in order to not sell the stocks?; (III) If the price decreases, how would you feel in order to sell the stocks; (IV) If the price increases, how would you feel in order to sell the stocks. On the same page ratings are made on 0-to-10 numerical scales in the following fixed order: (1) How strongly hope is felt that the price goes up/continues to go up/; (2) How strongly elation is anticipated by selling/not selling/; (3) How strongly fear is felt that the price goes down/continues to go down/; (4) How strongly disappointment is anticipated by selling/not selling/.

After having made the ratings, the following four questions are asked on a final page: (1) Do you own stocks or shares of stock funds (excluding the premium pension system) (Yes/No/Uncertain)?; (2) Do you usually inform yourself about the stock market, for instance about stock prices, forecasts, and stock deals (Often/Sometimes/Never)?; (3) How much knowledge do you have of stocks and stock funds (scale from 1 – very little knowledge to 5 – very much knowledge); (4) How much risk of losing are you prepared to take if you purchase stocks to earn a profit (scale from 1 – very little risk to 5 – very high risk). A majority of 19 (63.3%) participants do not own stocks or stock fund shares, 21 (70.0%) never inform themselves about the stock market, the mean rating of knowledge is a low 1.67 (Sd = 0.84), and the mean rating of risk a low 1.73 (Sd = 0.74).

Results and Discussion. Table 1 (see also Figure 3) shows the hypotheses tested for the ratings of strength of the emotions in the conditions I to IV.

<table>
<thead>
<tr>
<th>Holding stocks</th>
<th>Price decreasing</th>
<th>Price increasing</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Elation – Disappointment &lt; Hope – Fear &lt; 0</td>
<td>II. 0 &lt; Elation – Disappointment &lt; Hope – Fear</td>
<td></td>
</tr>
<tr>
<td>Sell preference &lt; 0</td>
<td>Sell preference &lt; 0</td>
<td></td>
</tr>
<tr>
<td>Selling stocks</td>
<td>III. 0 &gt; Elation – Disappointment &gt; Hope – Fear</td>
<td>IV. Elation – Disappointment &gt; Hope – Fear &gt; 0</td>
</tr>
<tr>
<td>Sell preference &gt; 0</td>
<td>Sell preference &gt; 0</td>
<td></td>
</tr>
</tbody>
</table>

Note: Sell preference = Elation – Disappointment – (Hope – Fear).

The mean ratings of hope, fear, elation, and disappointment are given in Table 2. The table also shows the sums and differences of the ratings of hope and fear and elation and disappointment, respectively. If hope increases at the same rate as fear decreases and elation increases at the same rate as disappointment decreases, the ratings would be related as \( Y = 5 = -(X - 5) \) or \( Y = 10 - X \) with the origin being the midpoint of the rating scales. We thus assume that hope and fear, as well as elation and disappointment, are experienced simultaneously in varying degrees. However, it may be seen in Table 2 that the mean sums tend to deviate from the expected value of 10 (\( Y + X = 10 \)). One-sample \( t \)-tests show that the deviations are significant for both the sum of the ratings of elation and disappointment and the sum of the ratings of hope and fear in the conditions holding the stocks when the price decreases, \( t(29) = -2.27, p = .031, \) and \( t(29) = 4.14, p < .001, \) and when the price increases, \( t(29) = -2.22, p = .035, \) and \( t(29) = 5.90, p < .001. \) The average correlation across all the conditions is -.37 between the ratings of elation and disappointment and -.24 between the ratings of hope and fear.

\[ \text{An alternative is that feeling hope excludes feeling fear and anticipated elation excludes anticipated disappointment. The ratings would in this case show no systematic relationship.} \]
In the bottom row of Table 2 the sell preference in each condition is given. As can been seen, the sell preferences have the hypothesized signs, that is, negative for holding stocks and positive for selling stocks. Furthermore, as expected, anticipated elation exceeds anticipated disappointment when selling stocks at increasing prices and the reverse when holding stocks both at increasing and decreasing prices. However, inconsistent with the hypotheses, anticipatory hope does not exceed anticipatory fear when the price increases and the reverse when it decreases. The results of statistical significance tests are indicated in Table 2 and reported in detail in the next paragraph.

Table 2. Means (M) and standard deviations (Sd) of emotion ratings related to price changes and decision to sell versus hold stocks (Experiment 1, n = 30).

<table>
<thead>
<tr>
<th>Rating scale</th>
<th>Price increase</th>
<th>Price decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Holding stocks M (Sd)</td>
<td>Selling stocks M (Sd)</td>
</tr>
<tr>
<td>Elation</td>
<td>3.30 (2.10)</td>
<td>4.60 (2.62)</td>
</tr>
<tr>
<td>Disappointment</td>
<td>5.47 (2.79)</td>
<td>4.90 (2.82)</td>
</tr>
<tr>
<td>Mean sum</td>
<td>8.77* (2.98)</td>
<td>9.50 (3.14)</td>
</tr>
<tr>
<td>Mean difference</td>
<td>-2.17** (3.94)</td>
<td>-0.30 (4.45)</td>
</tr>
<tr>
<td>Hope</td>
<td>7.23 (2.11)</td>
<td>3.40 (2.14)</td>
</tr>
<tr>
<td>Fear</td>
<td>5.30 (2.89)</td>
<td>6.53 (2.47)</td>
</tr>
<tr>
<td>Mean sum</td>
<td>12.53*** (3.35)</td>
<td>9.93 (2.88)</td>
</tr>
<tr>
<td>Mean difference</td>
<td>1.93** (3.80)</td>
<td>-3.13*** (3.63)</td>
</tr>
<tr>
<td>Sell preference</td>
<td>-4.10** (6.26)</td>
<td>2.83*** (7.06)</td>
</tr>
</tbody>
</table>

Note: Sell preference = Elation − Disappointment − (Hope − Fear). *p<.05 **p<.01 ***p<.001

The following statistical support for the hypotheses is obtained by means of paired-samples t-tests of the differences between the ratings of elation and disappointment and the ratings of hope and fear (the sell preferences), and by means of one-sample t-tests of whether the mean differences between the ratings of elation and disappointment and between the ratings of hope and fear, respectively, are positive or negative. (1) Hypothesis I (Elation − Disappointment < Hope − Fear < 0) is supported in that in the condition holding the stocks when the price decreases, the hope-fear ratings difference is significantly larger than the elation-disappointment ratings difference, $t(29) = 3.59, p = .001$, and consistent with the hypothesis, that the elation-disappointment ratings difference is negative and significant, $t(29) = -3.01, p = .005$. Inconsistent with the hypothesis the hope-fear ratings difference is positive. (2) Hypothesis II (0 < Elation − Disappointment < Hope − Fear) is supported in that in the condition holding the stocks when the price increases, the hope-fear ratings difference is significantly larger than the elation-disappointment ratings difference, $t(29) = 4.72, p < .001$, and consistent with the hypothesis, that the hope-fear ratings difference is positive and significant, $t(29) = 2.81, p = .009$. Inconsistent with the hypothesis the elation-disappointment rating difference is negative. (3) Hypothesis III (0 > Elation − Disappointment > Hope − Fear) is supported in the condition selling the stocks when the price decreases in that the elation-disappointment ratings difference is significantly larger than the hope-fear ratings difference, $t(29) = 2.20, p = .045$, and consistent with the hypothesis, that the hope-fear ratings difference is positive and significant, $t(29) = 2.99, p = .006$. Consistent with the hypothesis the elation-disappointment ratings difference is negative although not significant, $t(29) = -0.37, p = .715$. (4) Hypothesis IV (0 < Elation − Disappointment < Hope − Fear) is supported in that in the condition selling the stocks when the price increases, the elation-disappointment ratings difference is significantly larger than the hope–fear ratings difference, $t(29) = 4.34, p < .001$, and consistent with the hypothesis the elation-disappointment ratings difference is positive and significant, $t(29) = 5.56, p < .001$. Inconsistent with the hypothesis the hope-fear ratings difference is negative.
In summary, the results only partially support the hypotheses. Sell preferences have the expected signs but anticipatory fear of losing appears to have a stronger than hypothesized influence. If the ratings of elation are compared to the ratings of anticipatory hope, thus ignoring the ratings of disappointment and fear, the results are consistent with the hypotheses in that the ratings of elation exceed the ratings of hope when selling the stocks and the reverse when holding the stocks. The ratings of hope and elation do still not vary with price as would be expected. Experiments 2 and 3 are therefore designed to make possible to assess how the ratings of anticipatory hope and fear and anticipated elation and disappointment vary when the stock price increases (Experiment 2) or decreases (Experiment 3). When the price increases Hypotheses II and IV are tested, whereas when the price decreases Hypotheses I and III are tested.

Experiment 2

Participants and Procedure. Another 70 undergraduates (47 women, mean age 27.38 years with standard deviation 12.07 years) at University of Gothenburg are recruited to a internet-based study. E-mails are sent to 200 psychology undergraduates who have signed up to a pool of volunteers. They are asked to access a survey at a given web address to participate in a study of how one feels when trading in a stock market. A gift card for a cinema ticket (worth SEK 90 or about USD 10) is promised to those who first finish the survey. When accessing the questionnaire, participants are told that they are going to perform a fictitious task of selling stocks they own. They are informed that among those 10 participants who first finish the survey, five participants selling at the highest price will receive the gift card. We expect that this incentive will both make participants to promptly answer the survey without making any breaks and to increase the likelihood that the price changes elicit emotional responses.

The instructions presented on the first page are the same as in Experiment 1 except informing participants that they will be presented the stock price during consecutive weeks and that they each week have the opportunity to sell the stocks. On each of 10 following pages corresponding to consecutive weeks, the opening price of the stock is then presented for each of 5 trading days as shown in Table 3. An increasing price from the purchase price SEK 250 is obtained as Price = 250 + (Day + 5[Week-1]) (with Day varying from 1 to 5 for Week varying from 1 to 10) to which random numbers sampled from a normal distribution with mean 0 are added for each day. On each page participants rate on 0-to-10 scales how strongly they hope that the price increases, how strongly they fear that the price decreases, how strongly they anticipate to feel elated if selling at the opening price on day 5, and how strongly they anticipate to feel disappointed if selling at the opening price on day 5. Then they indicate whether or not they will accept a bid to sell at the opening price on day 5.

Table 3. Opening price (SEK) of owned stock in 5 trading days for 10 consecutive weeks presented to participants in Experiment 2. (Bold-faced prices are weekly bids.)

<table>
<thead>
<tr>
<th>Day</th>
<th>Week 1</th>
<th>Week 2</th>
<th>Week 3</th>
<th>Week 4</th>
<th>Week 5</th>
<th>Week 6</th>
<th>Week 7</th>
<th>Week 8</th>
<th>Week 9</th>
<th>Week 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>249</td>
<td>252</td>
<td>260</td>
<td>262</td>
<td>271</td>
<td>279</td>
<td>281</td>
<td>285</td>
<td>291</td>
<td>295</td>
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<tr>
<td>2</td>
<td>252</td>
<td>256</td>
<td>260</td>
<td>264</td>
<td>270</td>
<td>277</td>
<td>284</td>
<td>285</td>
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<td>3</td>
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<td>261</td>
<td>266</td>
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<td>276</td>
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<td>290</td>
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<td>4</td>
<td>251</td>
<td>259</td>
<td>262</td>
<td>270</td>
<td>273</td>
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<td>5</td>
<td>253</td>
<td>259</td>
<td>264</td>
<td>271</td>
<td>275</td>
<td>280</td>
<td>283</td>
<td>292</td>
<td>295</td>
<td>301</td>
</tr>
</tbody>
</table>

Our goal is to obtain data for 30 participants who sell the stocks after the first week and latest the last week. We monitor the responses with respect to when the stocks are sold such that the survey could be closed at the time the goal is approximately achieved. When participants decide to sell the stocks, they are transferred to a page asking the same four
questions asked in Experiment 1 related to stock investments. The results are approximately the same as in Experiment 1 for those 35 who fulfill the criterion (within parentheses the results are also given for the remaining 16 participants who sell the stocks the first week and the 19 participants who never sell the stocks): 24 (8 and 8) participants do not own stocks or stock fund shares, 20 (10 and 8) never inform themselves about the stock market, the mean rating of knowledge is 1.71 (2.56 and 2.16), and the mean rating of risk 2.26 (2.25 and 2.42).

The survey program recorded start and end times for each participant. We convert this information to response times in minutes. Although participants are requested to answer the questionnaire without breaks, it may be suspected that a few participants with long response times fail to comply with this request. The mean response time for the participants who sell the stocks in the first week is 3.31 minutes with a standard deviation of 1.53 minutes (range 1 to 10 minutes), for the participants who sell the stocks after the first week 8.86 minutes (standard deviation 5.79 minutes and range from 2 to 30 minutes), and for the participants who never sell the stocks 15.74 minutes (standard deviation 10.12 minutes and range from 7 to 42 minutes).

After having finished the survey, participants are asked to provide their names and email addresses if they want to be eligible for the gift card. They were also asked to indicate whether they want to be informed about the results. A summary of the results were later sent to those indicating this interest.

**Results and Discussion.** A proper test of Hypotheses II and IV (see Table 1 and Figure 3) is only strictly possible for those participants who sell after the first week. An approximate test of Hypothesis IV is still possible for those participants who sell the first week and of Hypothesis II for those who never sell. Appendix A displays means and standard deviations of the ratings made for each week including the week the stocks are sold. For those participants who never sell, the means and standard deviations are reported for all weeks. It can be seen that as expected the ratings of hope and elation increase, whereas the ratings of disappointment decrease. Unexpectedly however, the ratings of fear also increase for participants who sell after the first week, although at a lower rate than the ratings of hope.

Tests of the hypotheses are conducted by comparing the mean ratings the week before the stocks are sold to the mean ratings the week the stocks are sold by participants who sell after the first week. The means are displayed in Table 4. The table also shows the mean ratings by participants who sell the first week, and the mean ratings the last week and the last week by participants who never sell. The sums of the ratings of hope and fear exceed 10, whereas the sums of the ratings of elation and disappointment are smaller than 10. As tested by one-sample t-tests, the differences from 10 are not significant for participants who sell in the first week. In contrast, the differences from 10 for the ratings of hope and fear the week before and the week sold are significant for participants who sell after the first week,  

\[ t(34) = 6.48, p < .001, \text{ and } t(34) = 5.52, p < .001, \]

and the differences from 10 for the ratings of hope and fear and of elation and disappointment the next last week and the last week are significant for participants who never sell,  

\[ t(18) = 2.18, p = .043, t(18) = 2.17, p = .043, t(18) = -2.26, p = .037, \text{ and } t(18) = -2.98, p = .008. \]

For participants who sell after the first week the average correlation across conditions is .04 between the ratings of hope and fear, and -.40 between the ratings of elation and disappointment. For participants who never sell the average correlations are -.56 and -.61. For participants who sell the first week, the correlations are -.51 between the ratings of hope and fear and -.74 between the ratings of elated and disappointed. The near-zero correlation between the ratings of hope and fear for participants who sell after the first

\[ \text{The comparison between the last and next last week for participants who do not sell is intended to provide an appropriate contrast to the comparison between the week before and week sold for participants who sell after the first week.} \]
week reflects that for some participants the correlation between the ratings of hope and fear is as expected negative across the price increase, whereas for others it is positive.

Table 4. Means (M) and standard deviations (Sd) of emotion ratings by participants who sell first week, after first week, and never sell (Experiment 2).

<table>
<thead>
<tr>
<th>Rating scale</th>
<th>Sell first week (n = 16)</th>
<th>Sell after first week (n = 35)</th>
<th>Never sold (n = 19)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (Sd)</td>
<td>Week before sold M (Sd)</td>
<td>Week sold M (Sd)</td>
</tr>
<tr>
<td>Elation</td>
<td>6.44 (2.56)</td>
<td>7.00 (1.35)</td>
<td>8.17 (1.46)</td>
</tr>
<tr>
<td>Disappointment</td>
<td>3.44 (2.42)</td>
<td>2.60 (1.80)</td>
<td>2.14 (1.90)</td>
</tr>
<tr>
<td>Mean sum</td>
<td>9.88 (1.78)</td>
<td>9.60 (1.94)</td>
<td>10.31 (1.66)</td>
</tr>
<tr>
<td>Mean difference</td>
<td>3.00* (4.65)</td>
<td>4.40** (2.52)</td>
<td>6.03*** (2.96)</td>
</tr>
<tr>
<td>Hope</td>
<td>5.19 (2.17)</td>
<td>7.26 (1.46)</td>
<td>7.40 (1.68)</td>
</tr>
<tr>
<td>Fear</td>
<td>5.12 (2.28)</td>
<td>5.31 (2.22)</td>
<td>5.97 (2.60)</td>
</tr>
<tr>
<td>Mean sum</td>
<td>10.31 (2.21)</td>
<td>12.57*** (2.76)</td>
<td>13.37*** (3.08)</td>
</tr>
<tr>
<td>Mean difference</td>
<td>0.06 (3.86)</td>
<td>1.94*** (2.55)</td>
<td>1.43* (3.11)</td>
</tr>
<tr>
<td>Sell preference</td>
<td>2.94* (5.52)</td>
<td>2.46*** (2.78)</td>
<td>4.60*** (3.31)</td>
</tr>
</tbody>
</table>

*Note. Sell preference = Elation – Disappointment – (Hope – Fear). *p<.10 *p<.05 **p < .01 ***p<.001

Hypothesis II is supported in that for participants who never sell the elation-disappointment ratings difference is smaller than the hope-fear ratings difference (see bottom row in Table 4) in both the next last and last weeks. No effect is however significant in a repeated-measures 2 (time) by 2 (difference) analysis of variance (ANOVA). In one-sample t-tests the elation-disappointment ratings difference and the hope-fear ratings difference are as expected positive and significant in the next last week, \(t(18) = 2.85, p = .011\), and \(t(18) = 2.63, p = .017\), and in the last week, \(t(18) = 3.99, p = .001\), and \(t(18) = 3.75, p = .001\).

Support for Hypotheses II and IV is obtained for participants who sell the first week showing that the difference between the ratings of elation and disappointment is larger than the difference between the ratings of hope and fear. The difference is marginally significant in a paired-samples t-test, \(t(15) = 2.13, p = .050\). In one-sample t-tests only the elation-disappointment ratings difference is as expected positive and significant, \(t(15) = 2.58, p = .021\).

In the test of Hypotheses II and IV performed for participants who sell after the first week, it is found that since the ratings of fear increases when hope increases, the elation-disappointment ratings difference exceeds the hope-fear ratings difference both the week before and the week sold. In paired-samples t-tests the former difference increases significantly from the week before to the week sold whereas the latter does not, \(t(34) = 3.06, p = .004\), and \(t(34) = 1.15, p = .259\). The increase in the positive sell preference is therefore significant, \(t(34) = 3.71, p = .001\). In additional one-sample t-tests all differences are furthermore as expected positive and significant, \(t(34) = 4.50, p < .001\), the hope-fear ratings difference the week before sold; \(t(34) = 2.72, p = .010\), the hope-fear ratings difference the week sold; \(t(34) = 10.32, p < .001\), the elation-disappointment ratings difference the week before sold, and; \(t(34) = 12.07, p < .001\), the elation-disappointment ratings difference the week sold. The positive sell preferences are also significant both the week before sold and the week sold, \(t(34) = 8.22, p < .001\), and \(t(34) = 5.23, p < .001\).

To summarize, the results support Hypotheses II and IV in that the sell preferences are positive for participants who sell and negative for participants who never sell. Yet, the sell preference is also positive although lower the week before selling for participants who sell after the first week. Substantiating that this is due to the increasing fear ratings, support for Hypotheses II and IV is obtained in that the ratings of elation are as expected lower than the ratings of hope the week before sold and higher than the ratings of hope the week sold. In
paired-samples $t$-tests the difference is not significant the week before sold but the week sold, $t(34) = 1.00, p = .324$, and $t(34) = -2.90, p = .006$. Furthermore, the ratings of elation increases significantly from the week before sold to the week sold, $t(34) = 5.01, p < .001$, whereas the ratings of hope do not change, $t(34) = 0.74, p = .454$.

**Experiment 3**

**Participants and Procedure.** Experiment 3 differed from Experiment 2 in that the stock price decreases. When accessing the questionnaire, all participants are promised a gift card for a cinema ticket if they sell at a higher price than the purchase price (which is not possible), but also that five participants among those 10 participants who first finish the survey will obtain the gift card if selling at the highest price.

Based on previous research demonstrating the disposition effect (e.g. Shefrin & Statman, 1998), we expect that fewer would sell within the 10-week time frame. For this reason we choose prices such that the decrease is twice as steep as the increase. The same prices constructed for Experiment 2 is thus transformed by Decreasing Price = 250 – 2*(Increasing Price – 250).

We e-mail another 300 undergraduates available in the pool. After 88 participants (57 women, mean age 28.58 years with standard deviation 12.07 years) have responded, the survey is closed since by then we have obtained data for 38 participants selling the stocks after the first week and not later than the last week. The answer to the post-experimental questions show that 23 (16 of those 37\(^7\) remaining who answered the questions) participants do not own stocks or stock fund shares, 28 (19) never inform themselves about the stock market, the mean rating of knowledge is 1.63 (1.26) and the mean rating of risk 2.21 (1.43).

For participants who sell the stocks in the first week response time varies from 2 to 11 minutes with a mean of 4.20 minutes (standard deviation 2.95 minutes), for participants who sell the stocks after the first week response time varies from 2 to 61 minutes with a mean of 8.84 minutes (standard deviation 9.98 minutes), and for participants who never sell the stocks response time varies from 5 to 180 minutes with a mean of 16.01 minutes (standard deviation 29.40 minutes). The extreme long response times are likely due to participants not complying with the instructions to not make breaks.

**Results and Discussion.** The results make possible a proper test of Hypotheses I and III (see Table 1 and Figure 3) for participants who sell after the first week, and approximate tests of Hypotheses III for participants who sell the first week and of Hypothesis I for participants who never sell. In Appendix B means and standard deviations are given of the ratings by participants (n = 13) who sell the first week, for participants (n = 38) who sell after the first week, and for participants (n = 37) who never sell. As expected the ratings of hope and elation decrease, whereas the ratings of fear and disappointment increase. Table 5 shows that the sums of the ratings are close to the expected sum of 10. The average correlation is -.33 between the ratings of hope and fear and -.55 between the ratings of elation and disappointment.

Hypothesis I (Elation – Disappointment < Hope – Fear < 0 when holding the stocks) is tested by comparing the mean ratings the next last week to the mean ratings the last week by participants who never sell. Table 5 shows that consistent with the hypothesis, all the mean differences are negative and significantly different from 0 in one-sample $t$-tests, $t(36) = -12.92, p < .001$, elation-disappointment ratings difference next last week; $t(36) = -6.07, p < .001$, elation-disappointment ratings difference last week; $t(36) = -12.29, p < .001$, hope-fear ratings difference last week, and; $t(36) = -5.92, p < .001$, hope-fear ratings difference next last week.

\(^7\)Due to a computer error some participants’ answers were lost.
Table 5. Means (M) and standard deviations (Sd) of emotion ratings by participants who sell the first week, after the first week, and never sell (Experiment 3).

<table>
<thead>
<tr>
<th>Rating scale</th>
<th>Sell first week (n = 13)</th>
<th>Sell after first week (n = 38)</th>
<th>Never sell (n = 37)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Week before sold M (Sd)</td>
<td>Week sold M (Sd)</td>
<td>Next last week M (Sd)</td>
</tr>
<tr>
<td>Elation</td>
<td>4.85 (2.99)</td>
<td>1.89 (2.01)</td>
<td>0.92 (1.67)</td>
</tr>
<tr>
<td>Disappointment</td>
<td>4.85 (2.23)</td>
<td>7.21 (2.07)</td>
<td>7.68 (2.55)</td>
</tr>
<tr>
<td>Mean sum</td>
<td>9.69 (3.20)</td>
<td>9.10 (1.69)</td>
<td>9.34 (1.88)</td>
</tr>
<tr>
<td>Mean difference</td>
<td><strong>0.00 (2.83)</strong></td>
<td><strong>-5.32</strong>* (3.71)**</td>
<td><strong>-6.03</strong>* (4.33)**</td>
</tr>
<tr>
<td>Hope</td>
<td>4.85 (1.46)</td>
<td>2.87 (2.18)</td>
<td>1.58 (1.67)</td>
</tr>
<tr>
<td>Fear</td>
<td>5.38 (2.98)</td>
<td>6.87 (2.17)</td>
<td>7.68 (2.12)</td>
</tr>
<tr>
<td>Mean sum</td>
<td>10.23 (2.62)</td>
<td>9.74 (2.84)</td>
<td>9.26 (2.05)</td>
</tr>
<tr>
<td>Mean difference</td>
<td><strong>-0.05 (3.91)</strong></td>
<td><strong>-4.00</strong>* (3.30)**</td>
<td><strong>-6.10</strong>* (3.22)**</td>
</tr>
<tr>
<td>Mean sell preference</td>
<td><strong>0.05 (4.81)</strong></td>
<td><strong>-1.32</strong>* (2.62)**</td>
<td><strong>0.07 (2.69)</strong></td>
</tr>
</tbody>
</table>

*Note. Sell preference = Elation – Disappointment – (Hope – Fear). **p<.01 ***p<.001

week. Furthermore, the elation-disappointment ratings difference is as expected more negative than the hope-fear ratings difference both next last and last week. The differences are significant in paired-samples t-tests, $t(36) = 4.60$, $p < .001$, and $t(36) = 3.88$, $p < .001$. It should however be noted that the ratings of disappointment exceeds the ratings of fear.

Hypothesis I (Elation – Disappointment < Hope – Fear < 0 when holding the stocks) is tested by comparing the mean ratings the next last week to the mean ratings the last week by participants who never sell. Table 5 shows that consistent with the hypothesis, all the mean differences are negative and significantly different from 0 in one-sample t-tests, $t(36) = -12.92$, $p < .001$, elation-disappointment ratings difference next last week; $t(36) = -6.07$, $p < .001$, elation-disappointment ratings difference last week; $t(36) = -12.29$, $p < .001$, hope-fear ratings difference last week, and; $t(36) = -5.92$, $p < .001$, hope-fear ratings difference next last week. Furthermore, the elation-disappointment ratings difference is as expected more negative than the hope-fear ratings difference both next last and last week. The differences are significant in paired-samples t-tests, $t(36) = 4.60$, $p < .001$, and $t(36) = 3.88$, $p < .001$. It should however be noted that the ratings of disappointment exceeds the ratings of fear.

The ratings by participants who sell after the first week support Hypotheses I and III (0 > Elation – Disappointment > Hope – Fear when selling the stocks) in that all the mean differences are negative and significant in one-sample t-tests, $t(37) = -8.82$, $p < .001$, the elation-disappointment ratings difference the week before sold; $t(37) = -8.57$, $p < .001$, the elation-disappointment ratings difference week sold; $t(37) = -7.48$, $p < .001$, the hope-fear ratings difference week before sold, and; $t(37) = -8.57$, $p < .001$, the hope-fear ratings difference week sold. The hope-fear ratings difference is furthermore as expected less negative than the elation-disappointment ratings difference the week before but not different the week sold. The former difference is significant in a paired-samples t-test, $t(37) = 3.09$, $p = .004$.

Despite that the stock price decreases at a rate twice the rate of increase, fewer participants in Experiment 3 than in Experiment 2 (14.77% versus 22.86%) sell in the first week and a larger number (42.05% versus 27.14%) never sell. The average week in which the stock price decreases at a rate twice the rate of increase, we had expected that a monetary loss twice as large as the monetary gain would have the same effect on the hope-fear balance such that approximately the same number of participants would sell before the last week as when the price decreases as when it increases. The fact that this was not born out is another issue worthy of investigating although beyond our current scope.
remaining participants sell is 5.29 in Experiment 3 compared to 4.40 in Experiment 2. These observations are consistent with the disposition effect (Shefrin & Statman, 1998). Selling the first week minimizes the loss. As Table 5 shows, the elated-disappointed ratings and hope-fear ratings differences are still not positive and do not differ from each other. According to Hypothesis III the differences were expected to be negative. It is possible that some participants sold in the first week because they believed it would increase their chance to obtain the gift cards. Their results may therefore not provide an adequate test of the hypothesis.

In Experiment 3 the results for those who sell after the first week and never sell more clearly support the hypotheses than the preceding experiments did. It should also be noted that hope decreases and fear increases when price decreases. We thus observe a difference to Experiment 2 in which on average both hope and fear increase with the increase in price.

**Discussion**

Drawing on the distinction between anticipatory and anticipated emotions we propose how their interaction may account for buy and sell preferences in asset markets. We argue that this is the level that needs to be examined to understand the influence of emotions on investors’ behavior although not undermining the value of analyses of market consequences. As an example of this, Gärling et al. (2015a) in a companion paper showed how the emotion account may explain the disposition effect among less sophisticated investors (who may be main drivers of the effect). In order to understand market consequences, it is still essential to recognize that investors in real asset markets are heterogeneous (Hirshleifer, 2015), varying in characteristics that moderate emotion influences. In our emotion account emotions are input to the cognitive processes (e.g. deliberate judgment and decision making) of experienced and sophisticated investors that eventually result in buy or sell choices primarily influenced by information rather than emotions. For less experienced and sophisticated investors, we claim that the cognitive processes are short-cut such that emotions play a decisive role.

The main tenet of the emotion account is that buy and sell preferences depend on price movements that (1) change anticipatory emotions of hope of earning and fear of losing money, and that (2) change anticipated emotions of elation associated with decisions to realize gains and anticipated disappointment associated with decisions to realize losses. Sell and buy preferences are proposed to be influenced by differences between the strength of the anticipatory emotions (the hope-fear balance) and the strength of the anticipated emotions (the elation-disappointment balance). Partial support for the hypothesized emotion influences is obtained in three laboratory experiments. In these experiments we investigate how undergraduate students with limited knowledge of stock markets rate anticipatory and anticipated emotions when a stock price increases or decreases and how their sell preferences change accordingly.

First, we note that the results of the experiments provide only partial support for the hypotheses derived from the emotion account. The inconsistent findings are primarily related to an unexpected asymmetry of how fear varies with price increases and decreases. We find that fear as well as hope, in at least some participants, increases when price increases, whereas hope does not increase when price decreases. One possible explanation is that price volatility influences anticipatory fear of losing more than it influences anticipatory hope of gaining. In a study by Dolansky and Vandenbosch (2012) of the mediating effect of perceptions of variance on ascending or descending sequence preferences, an increasing sequence is judged to be less variable than a decreasing sequence with identical variance, thus suggesting an impact of perceptions of stock price volatility such that decreasing prices are perceived as more volatile. How price volatility affects fear and hope is clearly a prioritized issue in further developing the emotion account.
Apart from that it is necessary to extend the empirical basis for the emotion account by additional studies, there are several lines of conceptual development that are desirable. A basic assumption is that some emotions are preferred to other emotions (anticipated elation preferred to anticipatory hope and anticipated disappointment preferred to anticipatory fear) when being of equal or higher strength. Empirical support is obtained by Västfjäll and Gärling (2006). Yet, they also find that situation-specific moods may influence the preference order. An example is the moderating effects of influences of incidental fear on sell decisions demonstrated in a simulated stock market by Lee and Andrade (2011). An additional incentive to investigate how incidental mood moderates the emotional determinants of buy and sell preferences is that the bulk of finance studies have examined mood-proxy effects (Hirshleifer & Shumway, 2003; Lucey & Dowling, 2005). Inducing different moods (e.g., Andrade, Odean, & Shengle, 2012) or measuring mood (Breaban & Noussaire, 2013) before asking stock-selling participants to rate their anticipatory and anticipated emotions would shed light on the issue.

Another issue concerns the interaction between anticipatory and anticipated emotions. The former is a proper emotion, whereas the latter is a cognitive representation of an emotion. Although sharing the same conscious elements of core affects (Västfjäll et al., 2004), anticipated emotions are possibly more easily controlled than anticipatory emotions. This may then partly account for why experience and sophistication seem to lead to less emotion influences. Degree of personal involvement may also sometimes differ depending on reversibility and size of impact of the consequences of investment decisions. Both anticipatory and anticipated emotions may then be influenced. These are additional important issues to address in future research.
### Appendix A. Experiment 2 (increasing price) (n = 70)

<table>
<thead>
<tr>
<th>Week sold</th>
<th>n (%)</th>
<th>Rating scale</th>
<th>Week 1 M (SD)</th>
<th>Week 2 M (SD)</th>
<th>Week 3 M (SD)</th>
<th>Week 4 M (SD)</th>
<th>Week 5 M (SD)</th>
<th>Week 6 M (SD)</th>
<th>Week 7 M (SD)</th>
<th>Week 8 M (SD)</th>
<th>Week 9 M (SD)</th>
<th>Week 10 M (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>16 (22.9)</td>
<td>Disappointed</td>
<td>6.67 (1.58)</td>
<td>7.22 (1.72)</td>
<td>6.86 (1.22)</td>
<td>6.29 (1.98)</td>
<td>6.43 (2.45)</td>
<td>7.67 (1.58)</td>
<td>4.31 (2.63)</td>
<td>6.33 (2.89)</td>
<td>7.75 (2.36)</td>
<td>5.00 (2.00)</td>
</tr>
<tr>
<td>2</td>
<td>9 (12.9)</td>
<td>Disappointed</td>
<td>6.67 (1.58)</td>
<td>7.22 (1.72)</td>
<td>6.86 (1.22)</td>
<td>6.29 (1.98)</td>
<td>6.43 (2.45)</td>
<td>7.67 (1.58)</td>
<td>4.31 (2.63)</td>
<td>6.33 (2.89)</td>
<td>7.75 (2.36)</td>
<td>5.00 (2.00)</td>
</tr>
<tr>
<td>3</td>
<td>7 (10.0)</td>
<td>Disappointed</td>
<td>6.67 (1.58)</td>
<td>7.22 (1.72)</td>
<td>6.86 (1.22)</td>
<td>6.29 (1.98)</td>
<td>6.43 (2.45)</td>
<td>7.67 (1.58)</td>
<td>4.31 (2.63)</td>
<td>6.33 (2.89)</td>
<td>7.75 (2.36)</td>
<td>5.00 (2.00)</td>
</tr>
<tr>
<td>4</td>
<td>7 (10.0)</td>
<td>Disappointed</td>
<td>6.67 (1.58)</td>
<td>7.22 (1.72)</td>
<td>6.86 (1.22)</td>
<td>6.29 (1.98)</td>
<td>6.43 (2.45)</td>
<td>7.67 (1.58)</td>
<td>4.31 (2.63)</td>
<td>6.33 (2.89)</td>
<td>7.75 (2.36)</td>
<td>5.00 (2.00)</td>
</tr>
<tr>
<td>5</td>
<td>2 (2.9)</td>
<td>Disappointed</td>
<td>6.67 (1.58)</td>
<td>7.22 (1.72)</td>
<td>6.86 (1.22)</td>
<td>6.29 (1.98)</td>
<td>6.43 (2.45)</td>
<td>7.67 (1.58)</td>
<td>4.31 (2.63)</td>
<td>6.33 (2.89)</td>
<td>7.75 (2.36)</td>
<td>5.00 (2.00)</td>
</tr>
<tr>
<td>6</td>
<td>2 (2.9)</td>
<td>Disappointed</td>
<td>6.67 (1.58)</td>
<td>7.22 (1.72)</td>
<td>6.86 (1.22)</td>
<td>6.29 (1.98)</td>
<td>6.43 (2.45)</td>
<td>7.67 (1.58)</td>
<td>4.31 (2.63)</td>
<td>6.33 (2.89)</td>
<td>7.75 (2.36)</td>
<td>5.00 (2.00)</td>
</tr>
<tr>
<td>7</td>
<td>4 (5.7)</td>
<td>Disappointed</td>
<td>6.67 (1.58)</td>
<td>7.22 (1.72)</td>
<td>6.86 (1.22)</td>
<td>6.29 (1.98)</td>
<td>6.43 (2.45)</td>
<td>7.67 (1.58)</td>
<td>4.31 (2.63)</td>
<td>6.33 (2.89)</td>
<td>7.75 (2.36)</td>
<td>5.00 (2.00)</td>
</tr>
<tr>
<td>9</td>
<td>3 (4.3)</td>
<td>Disappointed</td>
<td>6.67 (1.58)</td>
<td>7.22 (1.72)</td>
<td>6.86 (1.22)</td>
<td>6.29 (1.98)</td>
<td>6.43 (2.45)</td>
<td>7.67 (1.58)</td>
<td>4.31 (2.63)</td>
<td>6.33 (2.89)</td>
<td>7.75 (2.36)</td>
<td>5.00 (2.00)</td>
</tr>
<tr>
<td>10</td>
<td>1 (1.4)</td>
<td>Disappointed</td>
<td>6.67 (1.58)</td>
<td>7.22 (1.72)</td>
<td>6.86 (1.22)</td>
<td>6.29 (1.98)</td>
<td>6.43 (2.45)</td>
<td>7.67 (1.58)</td>
<td>4.31 (2.63)</td>
<td>6.33 (2.89)</td>
<td>7.75 (2.36)</td>
<td>5.00 (2.00)</td>
</tr>
<tr>
<td>&gt;10</td>
<td>19 (27.1)</td>
<td>Disappointed</td>
<td>6.67 (1.58)</td>
<td>7.22 (1.72)</td>
<td>6.86 (1.22)</td>
<td>6.29 (1.98)</td>
<td>6.43 (2.45)</td>
<td>7.67 (1.58)</td>
<td>4.31 (2.63)</td>
<td>6.33 (2.89)</td>
<td>7.75 (2.36)</td>
<td>5.00 (2.00)</td>
</tr>
</tbody>
</table>
### Appendix B: Experiment 3 (decreasing price) (n = 88)

<table>
<thead>
<tr>
<th>Week sold</th>
<th>n (%)</th>
<th>Rating scale</th>
<th>Week 1 M (SD)</th>
<th>Week 2 M (SD)</th>
<th>Week 3 M (SD)</th>
<th>Week 4 M (SD)</th>
<th>Week 5 M (SD)</th>
<th>Week 6 M (SD)</th>
<th>Week 7 M (SD)</th>
<th>Week 8 M (SD)</th>
<th>Week 9 M (SD)</th>
<th>Week 10 M (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 13 (14.8)</td>
<td>Hope M (SD)</td>
<td>4.85 (1.46)</td>
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<td>4.85 (2.23)</td>
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**Buy and Sell Preferences**

- **Week 1:** Disappointed (2.23)
- **Week 2:** Disappointed (4.5)
- **Week 3:** Disappointed (3.4)
- **Week 4:** Disappointed (4.5)
- **Week 5:** Disappointed (4.5)
- **Week 6:** Disappointed (4.5)
- **Week 7:** Disappointed (4.5)
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- **Week 9:** Disappointed (4.5)
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Acknowledgements

Financial support for this research was obtained through grants to the Center for Finance, School of Business, Economics, and Law, University of Gothenburg, from the Swedish Agency for Innovation Systems (Vinnova) (#2010-02449).

References


Figure Captions

Figure 1. The dimensional description (referred to as the affect grid) of core affects (Russell, 1980; Yik et al., 2011).

Figure 2. The hypothetical representation of anticipatory hope-fear and anticipated elation-disappointment in the affect grid.

Figure 3. The hypothetical relations of hope-fear and elation-disappointment differences to increases and decreases of a stock price from the purchase price (upper graph), and the resulting changes in buy and sell preferences (lower graph).
Figure 1

Activation

Excited
Ebullient

Elated
Happy

Serene
Contended

Placid
Calm

Tired
Lethargie

Sad
Gloomy

Upset
Distressed

Tense
Jittery

Displeasure

Pleasure

Deactivation

Buy and Sell Preferences 23
Figure 2
Buy preference > 0

Sell preference > 0

Price change

Balance

Downward price trend

Upward price trend

Anticipated elation – disappointment

Anticipatory hope – fear

Figure 3