$100 a month or $1,200 a year : regulatory focus and the evaluation of temporally framed product attributes

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ABSTRACT

Five studies test the idea that consumers' regulatory goals affect their evaluation of temporally framed product attributes. A salient promotion focus leads to more extreme evaluation of attributes framed in aggregate (*Lose 10 pounds over 10 weeks; Pay $1200 over a year*) as compared to disaggregate (*Lose 1 pound per week over 10 weeks; Pay $100 per month*) terms. However, no such difference in evaluation exists for prevention focused individuals. This effect held in both financial (Studies 1,2, and 4) and non-financial (Studies 3 and 5) domains, as well as for both benefits (Studies 1 through 4) and costs (Study 5). Furthermore, using different measures of magnitude perception, Studies 4 and 5 found that the effect was driven by biased magnitude judgments – promotion focused, but not prevention focused, individuals used the largeness of the numeric expression as a heuristic for quantity evaluation. These findings suggest marketers' strategy of aggregating benefits over a longer time period and disaggregating costs over a shorter time period may be effective only when the consumer is promotion focused.

1. INTRODUCTION

Costs and benefits which recur over time are extremely prevalent in the marketplace. Consumers searching for a weight loss program see advertisements promising the pounds that they can lose each week. Magazines and music streaming apps target potential subscribers by stating the effective price they would need to pay every month. Charities make sure that you know that donating a dollar a day can make a difference in someone's life. However, instead of showing the cost or benefit over a day or a week, marketing managers in these organizations have the choice of aggregating them over a longer period. The weight loss program can state the pounds which members can lose every month, the subscription services can frame their pricing in yearly terms, and the charities can tell you the yearly donation amount.

Marketers who have an intuition of consumer psychology would disaggregate costs and aggregate benefits. Their intuition would follow academic research on numerosity heuristic which has shown that people feel that a quantity is large when they see a larger number being used to describe it (Pelham, Sumarta, & Myaskovsky, 1994). A charity that seeks donation using a yearly (as compared to a daily) frame risks donors perceiving the donation amount (a cost) as too large (Gourville, 1998). On the other hand, a movie rental service is more likely to make consumers subscribe if they describe their benefit, the number of movies members have access to, over a year as compared to every week (Burson, Larrick, & Lynch, 2009).

Consumers, on the other hand, always reach a decision point with certain goals in mind. Imagine two office colleagues, Susan and Sara, both 35 years old and a bit overweight, who want to join a weight loss program. Susan wants to lose weight because she wants to look more attractive. On the other hand, Sara wants to lose

weight as she is concerned about obesity related diseases. What is the best way for a health club to target these consumers? Should they advertise the weight loss as "Lose one pound per week" or "Lose four pounds per month"? Should they price their membership at "$30 a month" or "$360 a year"? Academic research has not explored the effect that consumers' motivations have on the way they perceive such temporal (time-varying) frames. This research aims to address this unanswered question.

People have two fundamental needs in life – the need for advancement and that for security (Bowlby, 1969; Maslow, 1955). The need for advancement may lead to a greater focus on hopes and aspirations and the need for security may lead to a greater focus on safety and responsibilities. Higgins (*Regulatory Focus Theory*, RFT; 1997) called these two distinct motivational states promotion and prevention focus respectively. To illustrate this distinction, Susan, whom we met above, has an aspiration to look attractive which may lead to a promotion focus. Her friend, Sara, is more concerned about staying safe from obesity related risks which may lead to a prevention focus.

People in a promotion focus have an eager, approach oriented goal pursuit strategy while those in a prevention focus prefer a more vigilant strategy (Forster, Higgins, & Bianco, 2003). This affects the way they process information (Forster and Higgins, 2005; Lee, Keller, and Strenthal, 2010; Pham & Chang, 2010). When people are prevention focused and security concerns are salient, they process information more carefully by considering all the details available to them. However, when people are promotion focused and eagerness replaces vigilance, they process only what is most salient to them. These findings can help predict the way in which regulatory focus may affect the perception of temporal frames.

When viewing a temporal frame, a promotion focused consumer, with her eager approach oriented goal pursuit strategy, will focus only on the most salient aspect of the frame, the number used to describe an attribute. Such a consumer will feel that a cost or benefit is high when she sees an aggregate as compared to a disaggregate frame. On the other hand, a prevention focused consumer, owing to her vigilance, will process all aspects of a frame including the numeric expression, the level of aggregation, and the time over which the benefit or cost accrues. Thus, she will evaluate both an aggregate and a disaggregate frame similarly.

This research makes multiple contributions. First, the design of attributes is an important element of choice architecture, the idea that information presentation format affects judgments and decisions (Johnson et al., 2012; Thaler & Sunstein, 2008). Temporal framing of attributes affects consumer decisions because aggregating attributes over longer time periods may make consumers evaluate the attribute as larger (Gourville 1998; Burson et al., 2009; Goldstein, Hershfield, Benartzi, 2016). However, I show that this may not always be the case. The consumers' regulatory goals, a characteristic central to any decision-making process, may affect how they perceive such frames. Prevention focused consumers' evaluations may not be swayed by the level of aggregation of an attribute. Second, and following the above, I make a more general contribution to the current understanding of the numerosity heuristic, a decision-making bias which underlies multiple phenomena in the consumer decision making area (Bagchi & Davis, 2016). I show that making prevention focus salient can be used as a debiasing tool against the usage of this heuristic. Finally, my findings can guide practitioners and policy makers by suggesting ways in which numeric attributes should be framed while considering their target audience's salient goals. Alternatively,

they may couple their message with regulatory focus inducing frames to get the maximum returns from their communication campaigns.

2. LITERATURE REVIEW

A. Temporal Framing

Temporal framing of attributes first caught the attention of consumer researchers in the late 90's when Gourville (1998, 1999) examined "pennies-a-day" pricing strategy, a temporally recurring cost. Participants in Gourville's (1998) experiments viewed donation appeals framed either in a disaggregate, daily frame (e.g., "$1 a day") or an aggregate, yearly frame (e.g., "$350 a year"). To ensure that the frequency of actual payment remains constant across the two conditions, participants were told that the prorated amount will be deducted monthly from their pay checks. Gourville found that participants who viewed the donation appeal in a disaggregate frame were more likely to make the donation as compared to those who viewed the appeal in an aggregate frame. Gourville proposed a mental accounting mechanism for this phenomenon. Consumers compare prices with other similar expenses in their lives. As a disaggregate price ("$1 a day") looks small, consumers mentally account them as a small, ongoing expense, such as the price of their daily cup of coffee. This makes the donation appeal look trivial and affordable and consumers are more likely to donate to the cause. On the other hand, an aggregate price ("$350 a year") looks like something that the consumer does not encounter every day. So, the consumer mentally accounts it as a large, infrequent expense leading to the perception of the price being unaffordable.

A follow-up research provided further insights to this phenomenon. Gourville (2003) found that irrespective of the level of aggregation, consumers' purchase intentions were higher when they viewed a disaggregate price compared to when they viewed an aggregate price. A 'per day' price led to greater purchase intention

compared to a ‘per month’ price, which, in turn, resulted in greater purchase intent when compared to a ‘per year’ price. These results held across multiple product and service categories. Gourville also found that the effectiveness of disaggregate pricing reduced as the “per day” price became higher (typically with an inflexion point between $5 to $10).

While Gourville focused on the “pennies-a-day” pricing strategy, a cost, later research in this area focused on temporally framed benefits. Burson et al. (2009), while investigating the effect of scale expansion and contraction, found that expressing benefits in aggregate terms made the differences between various options more salient. A greater percentage of participants choosing between movie rental plans which offered 7 movies a week for $10 per month versus 9 movies a week for $12 per month preferred the former plan. However, their preferences reversed when the benefit was aggregated over a year. A greater percentage of participants preferred a plan which provided 468 movies a year for a $12 per month compared to 364 movies a year for $10 per month (Burson et al, 2009, Study 1). Aggregating the subscription benefit over a longer time made the perceived difference between the two plans appears larger which led to the preference reversal.

More recently, Goldstein et al. (2016) showed similar effects for retirement annuity plans. Participants who viewed an annuity plan expressed in a disaggregate, monthly frame (e.g., a monthly amount of $500 paid over the lifetime of the beneficiary) indicated that they felt the amount to be less adequate and were willing to save more towards retirement as compared to those who viewed the same annuity plan expressed in an aggregate, lumpsum frame (e.g., $100,000 paid in equal monthly payouts over the lifetime of the beneficiary).

It may be worthwhile discussing the mechanism underlying these effects. None of the studies mentioned above tested the underlying mechanism directly. However, these articles discussed possible mechanisms and provided indirect evidence. Gourville proposed a mental accounting framework. When a consumer comes across a price the consumer retrieves a comparable expense from her memory. Due to the small number in the disaggregate frame, e.g. $5 a day, leads consumers to think of a small ongoing expense, e.g., price of a daily cup of coffee, as the standard of comparison. Thus, the expense is mentally accounted as an inconsequential expense. Goldstein et al. provided a similar argument for their findings. The authors contend that people try to match the benefit with their current lifestyle. A monthly frame makes it easier for participants to realize that a smaller annuity will not go a long way in sustaining the participant's current lifestyle. Consistent with this explanation, the effect attenuated (and even reversed) when larger dollar amounts were used in the disaggregate frame. However, Burson et al. provided a more generalized explanation based on scale discriminability. These authors suggest that whenever a ratio scale is expanded by a factor greater than 1, it accentuates the difference between two options leading people to choose the option with a higher value (lower value for costs).

However, across the studies discussed above, a common finding is that consumers erroneously evaluated an attribute to be larger when it was aggregated over a longer time horizon and expressed using a larger number. In the case of Gourville (1998, 2003), consumers perceived a product to be more expensive when they saw an aggregate price. Similarly, they perceived the difference between alternatives as larger when they saw the aggregated values of attributes (Burson et al., 2009). Consumers also perceived an annuity to be more adequate when they saw the annuity amount expressed in aggregate, lumpsum frame as compared to a disaggregate, monthly frame

(Goldstein et al., 2016). These findings are consistent with the findings on the usage of numerosity heuristic, which suggests that people often use the largeness of a number to make magnitude judgments about the quantity the number is expressing (Pelham et al., 1994). For example, a consumer may feel that a meal with 1000 Kilojoules (239 Calories) is more fattening compared to a meal with 300 Calories. When consumers view temporal frames, an aggregate frame may lead to the perception of higher magnitude because a larger number is used to express the attribute. This may lead to lower evaluation of the attribute for cost related attributes and higher evaluation for benefit related attributes.

B. Numerosity Heuristic

Although using numbers to express a quantity is intended to bring objectivity in the expression, a rich tradition of research on framing effects has shown that quantitative information is not immune to contextual influences (Teigen, 2015). This tradition of research suggests that the same information, when expressed in different frames, may lead to different perception of quantity (e.g., the Asian Disease problem, Tversky & Kahneman, 1981). One class of framing effects pertains to the numerousness of the quantitative expression leading to the usage of the numerosity heuristic (Pelham et al., 1994).

People often rely on the sheer numerousness of the expression of a quantity, while neglecting other relevant information, to judge the magnitude of the quantity. This phenomenon has been termed as the numerosity heuristic (see Bagchi & Davis, 2016, for a recent review). For example, a person may evaluate an area of 4,000 square feet (372 square meters) to be greater than 500 square meters, as 4000 looks larger than 500. Studies suggest that the perceived positive correlation between

numerousness and magnitude may be innate in the human brain (Harvey et al., 2013). The effect of numerosity has also been reported in tribes without any numerical language (Dehane et al., 2008) as well as preverbal children (Gallistel & Gelman, 1991). It is, therefore, not surprising that the usage of the numerosity heuristic underlies multiple phenomena in the area of judgment and decision making.

One such phenomenon occurs when people transact in foreign (or unfamiliar) currencies. In many such situations, people use the face value of the amount to judge how expensive an item is, while neglecting the currency in which the transaction takes place (Gaston – Breton, 2006; Raghubir & Srivastava, 2002; Wertenbroch, Soman, & Chattopadhyay, 2007). For example, Gaston-Breton (2006) found that after the introduction of the euro, French consumers found the price difference between expensive and cheaper brands to be smaller when the price was expressed in euros as compared to French francs (1 EUR = 6.56 FF). On a similar vein, Wertenbroch et al. (2007) showed that rescaling budgets and transactions in an imaginary currency affected spending. Undergraduate participants from Hong Kong exhibited underspending when they were told that the transactions were in a less numerous imaginary currency (Tristania $ 1 = HK$18). On the other hand, participants overspent when they were told that the transactions were in a more numerous currency (Tristania $ 1 = HK$ 1/18).

Research in other domains has also observed similar effects. Pandelaere, Briers, & Lembregts (2011) showed that the difference between the evaluations of two products was higher when the attributes were expressed in more numerous (eg: a warranty of 84 versus 108 months) as compared to less numerous (eg: a warranty of 7 versus 9 years) scale. Bagchi & Li (2011) found in loyalty programs, the number of

points needed to attain a reward appears higher when the program magnitude is more numerous (e.g., 1000 points needed, 10 points / dollar spent) as compared to when it is less numerous (e.g., 100 points needed, 1 point /dollar spent). Similarly, Bagchi & Davis (2012) showed that a multi-item package expressed in more numerous terms (e.g., a web based television service priced at $285.90 for 580 hours) as compared to one expressed in less numerous terms (e.g., the same service priced at $28.59 for 58 hours) was perceived to be more expensive and led to lower trial intent.

Numerosity also affects people's evaluation of ratios. When evaluating ratios, people often focus on the numerator while neglecting the denominator of the ratio. When the numerator is expressed as a large number, the numerosity heuristic can lead to biases in judgments. Yamagishi (1997) showed that people evaluated a disease which affected 1,286 people out of every 10,000 as riskier compared to a disease which affected 24.14 people out of every 100. Similarly, Pacini & Epstein (1999) found that participants preferred a gamble where they had 9 in 100 chance of winning compared to another gamble where they had 1 in 10 chance of winning.

Given that the usage of numerosity heuristic leads to biases, many researchers have focused their attention on factors that may reduce the reliance on the usage of this heuristic. One such factor is the ease with which the decision maker can incorporate the other relevant, but less salient, information in their judgment. For example, in their research on loyalty programs discussed above, Bagchi & Li (2011) found that the effect of numerosity of the medium on evaluation is reduced if the step size is less ambiguous (e.g., 10 points per dollar spent) as compared to when it is more ambiguous (e.g., 7 to 13 points per dollar spent). Similarly, in the multi-item price study discussed above, Bagchi & Davis (2012) found that the effect of numerosity of the package-price

reduced when the price per unit was easier to calculate (e.g., $300/ $30 for 600 / 60 hours).

Another class of factors which is more pertinent to the current research is the reduction of the numerosity heuristic when people's attention is drawn to the other relevant information available to them. Continuing with the package price research discussed above, Bagchi & Davis (2012) showed that the effect of numerosity of the price reduced when order of the information was changed from price-item (e.g., $285.90 for 580 hours) to item-price (e.g., 580 hours for $285.90). It seems that forcing the number of hours into people's attention led to lower reliance on the largeness of the price. Attention to the such relevant information may also be drawn by using graphical cues. Shen and Urminsky (2013) showed that decision makers can be made to incorporate the unit in which a foreign currency is represented (and thus, attenuate the numerosity effect) by making the units visually salient by expressing it in a larger font size or a darker color. Similar effects of visual salience were found by Stone et al. (2003). Risk expressed as people harmed (salient information) over people at risk (less salient information) was higher when people were made to focus their attention on the salient information (e.g., by using asterisks or bar charts) but was lower when people were made to focus their attention on the background information (e.g., by using stacked bar charts or pie charts, where the less salient information became visually larger).

The above findings suggest that the usage of the numerosity heuristic may be attenuated when people take relevant, but less salient, information into account while making a decision. However, the factors discussed above are integral to the stimuli

(such as ambiguity, presentation order, visual cues). Can factors integral to the decision maker also impact the usage of all available information?

Consumers often make decisions with certain goals in mind. The literature discussed so far has not explored how these goals interact with the largeness of a number to affect consumers' attitudes and behavior. I next review the literature on regulatory focus theory and argue that a person's salient regulatory focus will affect the way they incorporate numerosity in a decision.

C. Regulatory Focus Theory

Regulatory focus theory (Higgins, 1997, 1998) distinguishes between two fundamental self-regulation systems – prevention focus and promotion focus. This theory follows from the hedonic principle, a rich tradition of social psychological research which suggests that people are motivated to approach a desired end state and avoid an undesired end state (e.g. Gray 1982; Bandura 1986; Atkinson 1964). However, regulatory focus is distinct from the hedonic principle. Regulatory focus theory posits that people differ in the *way* they approach their desired end state.

Some people have a strong sense of their ideals and aspirations and a strong need to advance to those ideals. This focus on the *ideal self* makes them mainly concerned with the presence or absence of positive outcomes. These are promotion focused individuals. Others have a strong sense of their duties and obligations. They have a stronger need for security. They are mainly concerned with the presence of negative outcomes so that they can reach their *ought self*. These are prevention focused individuals (Higgins, 1997). Although people can be chronically prevention or promotion focused, at a given moment, either foci can become accessible due to situational factors and affect people's behavior (Higgins 2000a). Regulatory focus

theory is distinct form the general hedonic principle as it suggests that people can approach desired end states either by achieving the positives, ensuring gains, and focusing on ideals or by avoiding negatives, ensuring against losses, and focusing on oughts. As such, whether pleasure or pain is achieved during goal pursuit would depend on whether there is a match between people's orientation towards a goal and the means used to achieve the goal. When there is a match, the value of the outcome increases and people derive greater pleasure (*regulatory fit*; Higgin 2000b).

The last two decades have seen extensive research on the way people's salient regulatory focus affect their attitudes and behavior (see Molden, Lee, & Higgins, 2008 for a review). Some of the major findings in this stream of literature are discussed below.

i. Motivation for goal pursuit

People's regulatory focus has the most profound effect in which they pursue goals. The motivation to pursue goals is highest when the way in which people pursue goals matches their regulatory orientation (*regulatory fit;* Higgins, 2000b). In other words, promotion focused individuals will be most motivated when they pursue goals using approach oriented, eager strategies. Prevention focused individuals, on the other hand, will be most motivated when they pursue goals using avoidance oriented, vigilant strategies. When people experience a match, they *feel right* about their goal pursuit which increases the value of the outcome (Higgins, Idson, Freitas, Spiegel, & Molden, 2003; Motyka et al., 2014).

ii. Emotions

Regulatory focus also affects the emotions that people experience when they attain (or fail to attain) goals. When promotion focused individuals attain goals, they

experience emotions such as *happiness* and *satisfaction*. When they don't, they are *disappointed*, *discouraged*, or *sad.* On the other hand, when prevention focused individuals attain goals, they are *calm* and *relaxed*. When they don't, they are *agitated*, *uneasy*, and *tensed* (Higgins, Shah, & Friedman, 1997). So, promotion focused people experience emotions on a *cheerfulness-dejection* dimension whereas prevention focused people experience emotions on a *quiescence-agitation* dimension (Higgins et al., 1997; Brockner & Higgins, 2001; Idson, Liberman, & Higgins, 2000).

iii. Risk perception and risky behavior

Although promotion focused individuals may be more prone to taking risks (e.g., Crowe & Higgins, 1997; Pham & Avnet, 2004; Zhou & Pham, 2004), recent research suggests that there may be nuances in the way regulatory focus affects risky behavior. Promotion focused individuals take risks only to move away from status quo but become risk averse once they experience gains (Zou, Schoeler, & Higgins, 2014). On the other hand, prevention focused individuals take risks when they face losses and the risky options provides a way to overcome the loss (Scholer, Zou, Fujita, Stroessner, & Higgins, 2010).

iv. Persuasion

A rich body of literature shows that regulatory focus affects the way people perceive advertisement claims framed in gain versus loss frames. Early research in this area found that appeals framed in gain (loss) frames are more persuasive when a message is promotion (prevention) focused (Lee & Aaker, 2004). However, persuasion depends on whether the regulatory focus of the message matches with the salient regulatory focus of the message recipient, resulting in a regulatory fit (Cesario, Grant, & Higgins, 2004). Persuasion also depends on the outcome of the act described in the

message and whether people are seeking pleasure or pain. When there is a mismatch between goals and frame (e.g., people seeking pleasure but the message outcome depicts pain), people are more persuaded when they do *not* experience regulatory fit (Malaviya & Brendl, 2014). Regulatory focus theory has been influential in increasing our understanding in important policy related domains such as anti-smoking advertisements (Kim 2006; Zhao & Pechmann, 2007), health related communication (Keller 2006), and financial decision making (Zhou & Pham, 2004).

v. Culture and self-construal

People can have two distinct views of self, an interdependent or an independent self-construal, which refers to the degree of connectedness with which a person views the self (Markus & Kitayama, 1991). Those with an interdependent self-construal tend to view themselves in relationship with others. Group membership and social harmony are important to them. Their focus is on their duties and obligations towards others (Heine, Lehman, Markus, & Kitayama, 1999). On the other hand, people with an independent self-construal view themselves less in relation with others. Their internal attributes such as their goals, preferences, and attitudes drive their behavior. They focus on their personal ideals and achievements (Heine & Lehman, 1997). Prior research has shown that Easterners possess a stronger interdependent self-construal whereas Westerners possess a stronger independent self-construal (Markus & Kitayama, 1991; Triandis, 1989).

Cultural values have been shown to affect the dominant self-regulatory focus that develops in a person. Westerners (and independents), who focus more on goals and aspirations, tend to be more promotion focus. On the other hand, Easterners (and interdependents), who focus on duties and obligations, tend to be prevention focused

(Lee, Aaker, & Gardner, 2000). As a result, in multiple studies, participants from Western cultures (or those with independent self-construal) were more persuaded by promotion focused messages whereas those from Eastern cultures (or those with interdependent self-construal) were more persuaded by prevention focused messages (Aaker & Lee, 2001; Lee et al., 2000; Kareklas, Carlson, & Muehling, 2012; Lin, Chang, & Lin, 2012; Uskul, Sherman, & Fitzgibbon, 2008). For example, in a classic study, Aaker & Lee (2001) found that participants primed with an independent (interdependent) self-construal evaluated a product more favorably when they viewed a promotion (prevention) oriented message.

D. Regulatory Focus and Information Processing

In the previous section, I have given an overview of some important antecedents and consequences of regulatory focus. In my dissertation, I would use a key finding from this stream of literature – the way regulatory focus affects information processing.

The different concerns that promotion and prevention focus elicit affect the fundamental way in which people process information. Prevention focused individuals are more concerned with their duties and responsibilities. They focus on their *ought* self and ensure that they are vigilant to meet their security needs. When these individuals process information, they focus on the concrete, individual pieces that make up the overall information. On the other hand, promotion focused individuals are more concerned about their hopes and aspirations. They focus on their *ideal* self. As a result, instead of focusing on concrete level information, they focus on the *big picture* and process only what is most salient. Consistent with this idea, multiple studies have shown that promotion focused people process information at a global level (Forster &

Higgins, 2005), think abstractly (Lee et al., 2010; Pennington & Roese, 2003), focus on higher level information (Pham & Chang, 2010) and on the relationship among objects (Zhu & Meyers-Levy, 2007). On the other hand, prevention focused individuals process information at a local level (Foster & Higgins, 2005), think concretely (Lee et al., 2010; Pennington & Roese, 2003), focus on lower level information (Pham & Chang, 2010) and on the specific attributes of objects (Zhu & Meyers-Levy, 2007). While speed is more important for promotion focused people, those with prevention focus are more concerned with accuracy (Forster, Higgins, & Bianco, 2003). The two distinct ways in which promotion and prevention focused people process information help them achieve their speed and accuracy goals, respectively.

Multiple studies have found that compared to promotion focused people, prevention focused people pay greater attention to the parts that make up a larger piece of information. In one such study, participants viewed multiple letters in smaller size (e.g., multiple ‘s’) arranged to form a letter of larger size (e.g., ‘H’). When primed with promotion focus, participants exhibited a global processing strategy and were quicker to identify the bigger letter, which arguably, was more visually salient. On the other hand, priming prevention focus led participants to process the information locally leading to a quicker identification of the smaller letter (Forster & Higgins, 2005). Similarly, Mourali and Pons (2009) found that in multiattribute, multioption choices, promotion focused participants were more likely to focus on one option at a time, form an overall evaluation, repeat this process for all options, and finally make a decision (an *alternative based* strategy; Bettman, Luce, & Payne, 1998). On the other hand, prevention focused participants compared the options in greater detail. They focused on one attribute at a time, compared all the options on that attribute, repeated

this process for all attributes, and then made a decision (an *attribute based* strategy). These findings suggest that while promotion focused people pay attention to the overall information, prevention focused individuals pay attention to the components which make up the information.

The two different ways in which promotion and prevention focused individuals process information also lead to them focusing on different aspects when processing the information. For example, people's salient regulatory focus influences the level at which they construe events and information (*construal level theory, CLT;* Trope & Liberman, 2010). Compared to prevention focused people, promotion focused individuals construe events and objects at a more abstract level. For example, Lee et al. (2000) found that compared to promotion focused participants, prevention focused participants used more number of categories to classify objects, a well-established measure of concrete thinking (Liberman, Sagristano, & Trope, 2002). Similarly, Pennington & Roese (2003) found that the importance of promotion related goals increase as the temporal distance from an event increases, suggesting a congruency between promotion focus and abstract thinking.

Other research also corroborated the assertion that promotion focus leads to greater attention on higher order details. Consumers often encounter hierarchically ordered choice sets where individual options belong to sub-categories, which in turn belong to super-categories (e.g., a restaurant menu when an item may belong to the *salad* sub category in the *starters* super-category). Pham & Chang (2010) found that when choosing among such hierarchical choice sets, promotion focused participants spent more time at higher levels of such choice set. On the other hand, prevention focused participants focused more on the individual options at an item specific level.

Promotion focus also leads to greater attention on the way things are related to each other as compared to prevention focus, which leads to greater attention on item-specific details. Zhu & Myers-Levy (2007) found that compared to prevention focused participants, promotion focused participants evaluated a product more favorably when disparate, non-obvious, and non-thematic visuals were used to describe a product. It seemed that promotion focus allowed participants to easily see the relationship among non-obviously related visuals.

To summarize, regulatory focus affects the way people process information. Promotion focus leads to greater attention on higher order, salient information. On the other hand, prevention focus leads to greater attention on the lower level components that make up the information. In the next chapter, I develop my hypotheses based on these findings.

3. CONCEPTUAL DEVELOPMENT

In the previous chapter, I discussed the different ways in which promotion and prevention focused individuals process information. Promotion focus leads people to process information at a higher level, by focusing on abstract, holistic, and *big picture* aspects of any information. On the other hand, prevention focus leads people to process information at a lower level, by focusing on concrete, item-specific aspects of the information.

Any temporally framed cost or benefit is expressed using three different components – the amount (or some other expression of cost or benefit), the time, and the level of aggregation. For example, imagine a diet program which promises a weight loss of "20 pounds over 20 weeks". In this case, the benefit is 20 pounds, the time is 20 weeks, and the level of aggregation is 20 weeks as well. The same claim can be framed as "1 pound per week over 20 weeks" in which case the benefit is 1 pound, the time is 20 weeks, and the level of aggregation is "per week". Sometimes, one of the components may be implied. For example, imagine a full-time employee who receives a monthly salary. This employee's salary can be expressed either as $5000 per month or $60,000 per year. In the former frame ($5000 per month), the level of aggregation is expressed (per month) whereas the time is implied (year, as employees' salaries generally remained unchanged for a financial year). In the latter frame ($60,000 per year), the time is expressed (a year) whereas the level of aggregation is implied (per month, as the salary payout frequency is monthly).

Research in the area of judgment and decision making suggests that people pay greater attention to the foreground information, such as an attribute value, numbers, numerators etc., as compared to background information such as units, denominators

etc. (Burson et al., 2009). This phenomenon underlies multiple effects such as denominator neglect (Reyna & Brainerd, 2008), background neglect (Stone et al., 2003), and ratio judgments (Pacini & Epstein, 1999; Yamagishi, 1997). This is because the foreground information, usually a number is easier to process and can be used as a heuristic. On the other hand, background information is typically more complex, such as different units, and thus, are neglected. Drawing from this stream of research, when we analyze the examples above, the first item that a person comes across is the numeric expression of the benefit or cost. This is also the most salient component as it is always expressed in a temporal frame, unlike the other two components which may be implied. Findings in consumer research also supports this possibility. Drawing from the construal level theory, Monga & Bagchi (2012) found that consumers pay greater attention to units (instead of numbers) only when they have an abstract mindset as units (as opposed to numbers) represent higher level, complex information.

In this research, I predict that while promotion focused consumers will focus only on the most salient aspect of the temporal frame, the numeric expression of the cost or benefit, prevention focused consumers will pay attention to all components of the frame, the numeric expression of the benefit or cost, the time over which it accrues, and the level of aggregation. As such, promotion focused consumers will evaluate that the magnitude of the cost or benefit to be higher in the aggregate frame owing to the numerosity heuristic, as a larger number is used to express the quantity in the aggregate frame. Thus, promotion focused consumers will evaluate an aggregate frame more extremely (more favorably for benefits and more unfavorably for costs) as compared to the disaggregate frame. On the other hand, the largeness of the number will affect prevention focused consumers' magnitude judgments less as they would

also focus on the other components of the frame. Therefore, their evaluation of the frame will not differ based on the level of aggregation.

Some existing research support these predictions. For example, regulatory focus is known to affect the way people evaluate partitioned prices. Retailers often present the total price of a product in a partitioned format. For instance, an online retailer may express the price of a book as $15 plus $2 for delivery (instead of a total price of $17 inclusive of delivery). Prior research suggests that consumers are more likely to buy a product when they view partitioned prices as they only process the base cost in the partitioned price ($15 in the example) which seems lower than the total cost ($17; Morowitz, Greenleaf, & Johnson, 1998). However, Lee, Choi, & Li (2014) found that this favorable evaluation for partitioned price depends on the regulatory focus of the consumers. In their experiments, promotion focused participants paid attention only to the most salient aspect of the price, the base price, while neglecting the other charges that were listed. Consequently, they evaluated the product more favorably when they viewed the partitioned price. However, prevention focused participants directed their attention to all available price components. They registered the base price as well as the delivery fee. Hence, price partitioning had no effect on their evaluation.

Similar results were obtained by Weaver, Garcia, & Schwarz (2012). These researchers found that when a mildly favorable information (e.g., one free song download) was added to a product description (e.g., an iPod Touch), the overall bundle is evaluated less favorably compared to the evaluation of only the product (i.e., an iPod Touch). This is because when consumers evaluate a bundle, they try to form a *big picture* or summary judgment about the bundle. To do so, they average the value of all

components and the mildly favorable component lowers the overall value of the bundle. However, they found that this effect did not hold for prevention focused participants. Instead of forming a holistic picture of the bundle by averaging, these participants considered each component separately and added the relative value of each component into their evaluation. As a result, the mildly favorable information did not affect their judgment and the evaluation of prevention focused participants did not differ across the two bundles.

These findings suggest that when prevention focused consumers view temporal frames, they will focus on all components of the frame. On the other hand, promotion focused consumers will pay attention to only the most salient aspect of the frame. This will make them prone to the usage of numerosity heuristic in their evaluation. Thus, while promotion focused consumers will evaluate an aggregate frame more extremely, no difference in evaluation will exist for prevention focused consumers. To illustrate, imagine promotion focused consumers who view either of the two frames for a weight loss program "20 pounds over 20 weeks" or "1 pound per week over 20 weeks", respectively. Promotion focus leads them to look for the most salient aspect of the frame, the numeric expression of the benefit. In doing so, they neglect other aspects of the frame, the time and the level of aggregation. This attention on the most salient component, the benefit, leads the first person to perceive the magnitude of the benefit to be higher as *20* clearly feels larger compared to *1*. On the other hand, if two prevention focused consumers view the two frames, owing to their item-specific processing and focus on details, these consumers will not only take into account the numeric expression of the benefit but also pay attention to the level of aggregation and the time over which the benefit accrues. As a result, they will have similar evaluations of the two frames.

Thus, I hypothesize that:

H1: Promotion focused consumers will evaluate the magnitude of a cost or benefit to be higher in the aggregate (vs. disaggregate) frame. No such difference in magnitude evaluation will exist for prevention focused consumers.

H2: Promotion focused consumers will evaluate an aggregate (vs. disaggregate) frame more extremely. No such difference in evaluation will exist for prevention focused consumers.

I test these hypotheses across five studies. Study 1 examines the effect of regulatory focus on the perception of a compensation package framed in either disaggregate (monthly) or aggregate (yearly) terms. Study 2 focuses on the downstream consequence of the phenomenon observed in Study 1 - consumers' savings behavior. Study 3 conceptually replicates the findings in a different context. This study examines the relationship between regulatory focus and the evaluation of a weight loss program framed at different levels of aggregation. Study 4 aims to shed light on the underlying mechanism for this phenomenon. This study tests if regulatory focus affects the magnitude perception of benefits framed in aggregate or disaggregate frames, and hence, affect the evaluation of the benefit. Finally, Study 5 tests the effect in contexts of costs. This study tests whether the perception of temporally framed prices depends on the perceivers' regulatory focus. Additionally, it also tests the underlying mechanism using a different measure of magnitude perception.

4. STUDY 1: EVALUATION OF SALARY

The most prevalent recurring financial event in a working person's life is the monthly salary credit. Consumers' income affects their attitude and behavior in a multitude of ways (e.g., Levedahl, 1980; Mishra, Mishra, & Nayakankuppam, 2010). Especially, the frequency with which consumers are paid have important downstream consequences such as the way they budget for expenses (Soman & Cheema, 2011; Huffman & Barenstein, 2004; O'Curry, 2000). Irrespective of the actual pay frequency, a person's salary can be expressed at different levels of aggregation. For example, a salary of $5000 a month can be expressed as $60,000 a year. Does this differential framing affect the evaluation of the salary depending on a person's salient regulatory focus? I predict that it does.

An aggregate frame makes the salary amount look larger in magnitude. As promotion focused consumers are more likely to focus on the salient information, the numerousness of an expression, they may evaluate an income stream in aggregate frame more favorably as compared to one expressed in a disaggregate frame. On the other hand, prevention focused consumers, who are more vigilant, will take into account the level of aggregation. Therefore, framing may have no effect on their evaluation. To test this prediction, I primed participants with either promotion or prevention focus and showed them a salary framed either in an aggregate (yearly) or disaggregate (monthly) frame. I predicted that promotion focused participants will evaluate the salary more favorably when they view it in an aggregate frame whereas prevention focused participants will exhibit no differences in evaluation based on frame.

Method

Participants and procedure. One hundred and fifty-two undergraduate students (M_{age} = 20.65 years, *SD*=1.27, 90 females) from an introductory marketing class at Nanyang Business School completed this study in return for partial course credit. I randomly assigned them to one of the cells of a 2 (Regulatory focus: Promotion/Prevention) X 2 (Frame: aggregate/ disaggregate) full factorial design.

I primed regulatory focus by adapting an anagram task (Jain, Lindsey, Agrawal, & Maheswaran, 2007). I informed participants that they were participating in a brand name quiz. Participants solved ten anagrams which were the jumbled form of ten popular brand names. In the promotion (prevention) focus condition, I told participants that every correctly (incorrectly) unscrambled brand name would gain (lose) them 2 points and their goal was to gain as many points (lose as few points) as possible by maximizing (minimizing) the number of names they go right (wrong). Next, as a manipulation check, participants responded to a 2-item scale indicating to what extent they were focusing on (1) scoring more points and (2) not losing any points in the brand name quiz (1=a very small extent, 8 = a very large extent; Jain et al., 2007). See Appendix A for full text of the manipulation instructions and the manipulation check questions.

Next, in an ostensibly unrelated task, participants imagined that they had completed their undergraduate program and had had been working in a large multinational company for the previous few months. I further informed all participants that the company followed a monthly pay cycle. In the aggregate (disaggregate) condition, I told participants that their current compensation package was $36,000 ($3,000 per month) for the first year with a possible revision of salary after that based

on performance. I selected this amount based on the median starting salary for undergraduates at Nanyang Business School. See Appendix B for the full text of both conditions.

Dependent measures. The dependent measure was participants' evaluation of the salary that the company was offering them. Participants indicated how (1) attractive and (2) adequate they thought the salary offered by the company was on a 7 point scale (r = .66; 1= very unattractive/inadequate, 7=very attractive/adequate). See Appendix B for full text of the questions.

Results and Discussion

Manipulation check. I subtracted participants focus on not losing points from participants' focus on scoring more points in the brand name quiz. A higher (lower) score on this index indicates a greater focus on scoring more points (not losing points) in the brand name quiz. Compared to participants primed with prevention focus, those primed with promotion focus scored higher on this index indicating a greater focus on scoring more points instead of not losing points in the brand name quiz ($M_{\text{promotion}}$ = 1.20, SD = 2.27, $M_{\text{prevention}}$ = -.46, SD = 2.98, $F(1,150) = 14.85$, $p < .001$).

Evaluation of the salary. A two-way ANOVA on participants' evaluation of their salary revealed only a significant interaction between regulatory focus and frame ($F(1,148) = 7.0$, $p = .01$). As shown in Figure 1, participants primed with promotion focus evaluated the salary more positively when it was expressed in a more aggregate, yearly frame ($M_{\text{aggregate}}$ = 4.84, SD = .88) as compared to a less aggregate, monthly ($M_{\text{disaggregate}}$ = 4.29, SD = .93, $F(1,148) = 5.39$, $p = .02$) frame. However, as hypothesized, no such difference in evaluation based on frame emerged for

participants primed with prevention focus ($M_{aggregate}$ = 4.40, *SD* = 1.12, $M_{disaggregate}$ = 4.73, *SD* = 1.11, $F(1,148) = 2.02$, $p = .16$).

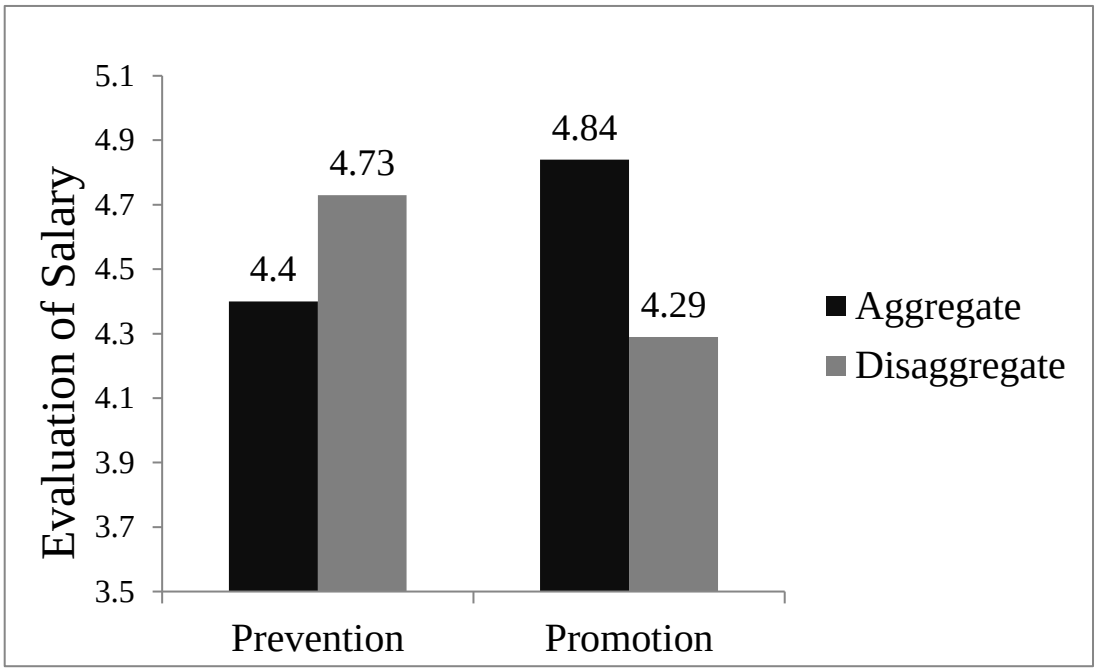

Figure 1: Evaluation of salary in study 1 based on regulatory focus and experimental conditions

Discussion. These results supported H2. Promotion focused participants evaluated the salary offered to them by their employer more positively when it was expressed in an aggregate, yearly frame as compared to when it was expressed in a disaggregate, monthly frame. On the other hand, prevention focus participants evaluated the salary equally favorably irrespective of the level of aggregation. These results indicate that regulatory focus does affect the way consumers process temporal frames.

As I have discussed above, a consumer's perception of her own income affects a host of behavior. In the next study, I examine one such domain where regulatory focus and temporal frames interact to predict an important financial behavior – consumers' retirement savings.

5. STUDY 2: RETIREMENT SAVINGS

People are living longer and saving less (Lusardi, 1999; Munnell & Golub-Sass, 2007). An important issue that concerns policy makers is to find ways to make people save more for their retirement. Prior research in the area of choice architecture has suggested various ways by which people can be 'nudged' to save more. These include using default options (Beshears, Choi, Laibson, & Madrian, 2009), lowering the number of choices (Cronqvist & Thaler, 2004) and categorizing the options into multiple categories (Benartzi & Thaler, 2001). How does viewing an income stream at different levels of aggregation affect people's saving intentions? Goldstein et al. (2016) tried answering this question by showing annuity incomes either at disaggregate ("$500 a month") or aggregate ("$100,000 over lifetime") frame. They found that when people viewed an annuity income in an aggregate frame, they experienced an illusion of being wealthy and were less likely to save more towards their retirement. However, does it matter whether people are thinking about a long retirement vacation versus about paying medical bills when they make such savings decisions?

In this study, I predict that people's salient regulatory focus will affect intentions to save for retirement depending on whether they view their current income at different levels of aggregation. This builds on the findings by Goldstein et al. (2016) in two-ways. Firstly, it adds an important boundary condition to the "illusion of wealth" effect – consumers' regulatory goals – and shows that not everyone is likely to be affected by it. Secondly, and more importantly, Goldstein et al. tested the "illusion of wealth" effect using a future stream of income. In this study, I explore whether

people's current stream of income also gives them the illusion of being wealthy. I predict that it does, but only for promotion focused consumers.

Method

Participants and procedure. I recruited 157 participants (M_{age} = 36.94 years , *SD* = 12.81, 81 females, 76 males) from the US using Amazon Mechanical Turk. As in the previous study, I randomly assigned participants to one of the cells of a 2 (Regulatory focus: prevention/promotion) X 2 (frame: aggregate/disaggregate) full factorial design.

In this study, I primed regulatory focus by adapting the strategy task, which is an established priming method (Li et al., 2011). As this study was conducted in early January, I told participants that the first part of the study was to explore how people plan their year. Participants in the promotion (prevention) focus condition thought and listed one goal (outcome) that they strongly wanted to achieve (avoid) in the year. Participants then listed four to six strategies that they would use to make sure that they achieve (avoid) the goal (outcome) that they had listed. To ensure that the participants were primed with the relevant regulatory focus, I used the manipulation check associated with this priming method. Participants indicated whether their current thoughts were about "my dreams" or "my fears". Please see Appendix C for full text of the manipulation and the manipulation check questions.

Next, in an ostensibly unrelated task, participants imagined that they had been offered a new job which they have accepted. Further, they read that the company followed a monthly pay cycle, i.e. salary was paid once every month. In the aggregate, yearly frame, participants read that they were offered a "total fixed salary of $42,000 for the entire year for the next 1 year". In the disaggregate, monthly frame, they read

that they were offered a "fixed salary of $ 3,500 per month for the next 1 year" As in study 1, in both conditions, participants read that their salary will be revised based on performance at the end of a year so that they did not mistakenly believe that the job was only for a year.

Dependent measures. Next, participants read that to encourage its employees to save more for their retirement, the company offered an optional low-risk investment plan where a fixed amount every month, as decided by the employee, will be invested in this plan. Participants indicated their likelihood of investing in the optional saving plan using a 4 item, 9 point scale anchored on (1) "how likely" (2) "how probable" (3) "how plausible" (4) "what are the chances" (1= not at all, 9 = very; α = .95). Please see Appendix D for full text of the stimuli and the dependent measures.

Results and Discussion

As the participants were from an online panel and weren't under strict experimental conditions, they may have used calculating devices to calculate the equivalent monthly (yearly) amount in the aggregate (disaggregate) condition. Therefore, nine participants who indicated using a calculating device during the survey were excluded from further analyses. The pattern of the results reported in this study, including the significance levels of the planned contrasts, held when these participants were included in the analyses.

Manipulation check. To check if the manipulation was successful, I coded "my dreams" as 0 and "my fears" as 1. A Chi-sq test revealed that compared to participants primed with prevention focus, those primed with promotion focus were more likely to have been thinking of their dreams rather than their fears (*Promotion focus* = 93.34%, *Prevention focus* = 55.79% , χ^2 (1) = 28.79, $p < .0001$).

Intention to save. A two-way ANOVA on participants' intention to invest in the optional investment plan revealed only a significant interaction effect between regulatory focus and frame ($F(1, 144) = 4.00$, $p = .047$). As shown in Figure 2, in the promotion focus condition, participants who saw their disaggregate salary, the monthly frame, were more likely to invest in the optional investment plan ($M_{disaggregate} = 6.95$, $SD = 2.01$) as compared to those who saw their aggregate salary in the yearly frame ($M_{aggregate} = 5.51$, $SD = 2.51$, $F(1,144) = 7.92$, $p = .005$). However, as predicted, no such differences in evaluation emerged for participants primed with prevention focus ($M_{disaggregate} = 6.49$, $SD = 2.14$, $M_{aggregate} = 6.51$, $SD = 2.18$, $F(1,144) < 1$).

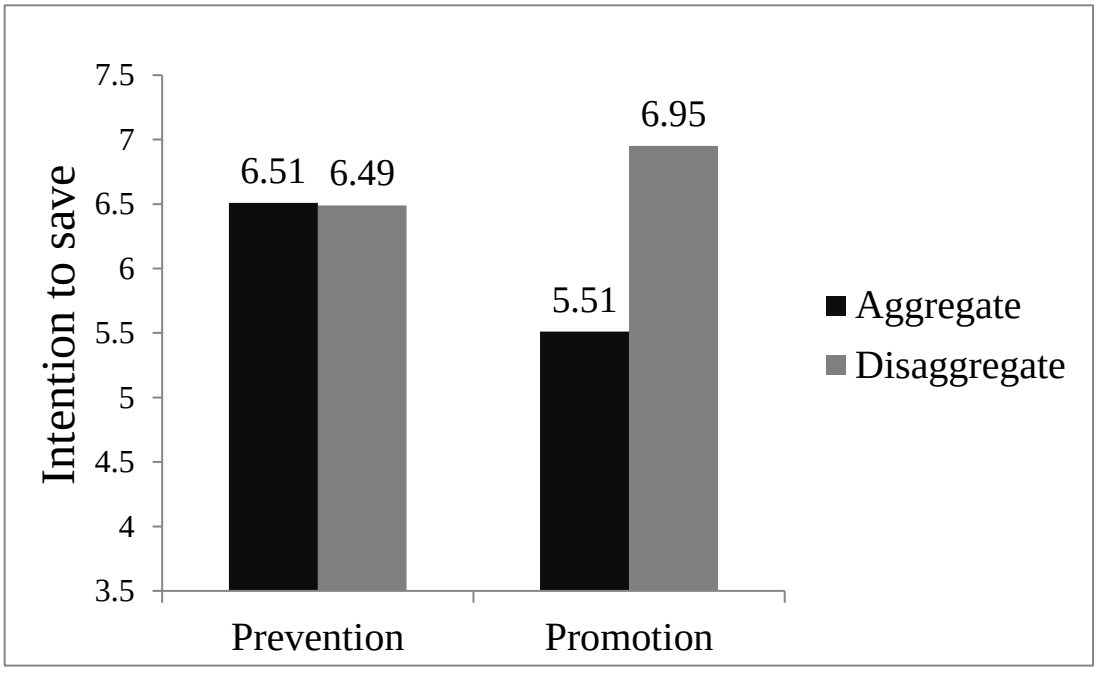

Figure 2: Intention to save in Study 2 based on regulatory focus and experimental conditions

Discussion. Study 2 explored an important consequence of the way regulatory focus affects the perception of temporal frames. When promotion focused participants viewed their current stream of income in aggregate as compared to disaggregate frame, they were less likely to participate in a retirement savings scheme. This mirrors the recent findings by Goldstein et al. (2016) which suggests that viewing one's stream of income in an aggregate form leads to an illusion of being wealthy, resulting in a reduced intention to save money. However, this effect did not hold for prevention focused participants. Irrespective of the frame that they viewed their current income in, they were equally likely to participate in the retirement saving scheme. It is likely that prevention focused participants paid attention to both the numerousness of the expression of their salary as well as the level of aggregation when making an evaluation of the salary, leading to the attenuation of the "illusion of wealth" effect documented by Goldstein et al. (2016).

6. STUDY 3: EVALUATION OF A WEIGHT LOSS AD

Although studies 1 and 2 showed robust results for my hypothesized effects, there were open questions which I aimed to answer in Study 3. First, in the first two studies, I tested the effect of regulatory focus on temporal frames only in the financial domain. How does this effect unfold in a non-financial domain? In this study, I tested the effect in a different, but equally important, domain – weight loss. Obesity is an important public policy issue (Ebbeling, Pawlak, & Ludwig, 2002). In this study, I explored how the level of aggregation at which the benefits from a weight loss program is expressed interacts with a decision maker's salient regulatory focus to affect the attitude towards the program.

Second, a criticism of the first two studies can be that a monthly and a yearly frame may lead to different temporal construal levels (Trope & Liberman, 2003). As regulatory focus has been known to be associated with construal levels (Pennington & Roese, 2003), is it possible that my results are driven by the construal levels induced by the stimuli? Although in the first two studies, I mentioned that the salary is meant for the first one year of the job, it may not have been salient in the participants' minds. In this study, I explicitly mention the duration of the weight loss program to ensure that the stimuli do not lead to different temporal construal levels.

Third, and leading from the above point, without an explicit time frame, participants may not have felt the need to take it into account in their judgments. To ensure a more conservative test of my hypothesis, I ensure that not only is the time frame mentioned, but also that the calculation of aggregate to disaggregate frame and vice versa is very easy. Finding the hypothesized effect in such a setting would ensure that the underlying effect is not motivational (prevention focus leading higher

motivation to calculate) but cognitive (promotion focus leading to processing only the most salient information).

Fourth, the scenarios used in the first two studies are ex post in nature, i.e. participants respond to stimuli after an event has already occurred. However, most advertisements used in the industry are ex ante in nature, i.e. participants view the stimuli and decide *before* trying out the product. This study tested the effect using an advertisement, and hence, was ex ante in nature. Finally, the above two studies primed regulatory focus in participants. In this study, I used a chronic regulatory focus measure. Although this reduces the ability to make a causal claim, demonstrating that personality characteristics can influence perception of temporally framed claims increases the ecological validity of the proposed theory.

Method

Participants and procedure. I recruited 126 participants (M_{age} = 37.58 years, *SD* = 13.13) from the US using Amazon Mechanical Turk. Following past studies which have used weight loss and dieting scenarios, I recruited only female participants for this study (e.g., Myrseth, Fishbach, & Trope, 2009). I randomly assigned participants to either aggregate or disaggregate conditions and measured participants' chronic regulatory focus at the end of the study.

Participants read a scenario where they had come across an advertisement for an eight-week weight loss program which combines a healthy diet and exercise and helps people burn approximately equal number of Calories every week. In the disaggregate condition, participants saw the advertisement claim framed as "Join our program and burn 800 Calories per week over the next 8 weeks". In the aggregate

condition, the same claim was framed as "Join our program and burn 6400 Calories over the next 8 weeks". See Appendix E for the full text of the stimuli.

Measures. Participants rated their evaluation of the benefit, the Calorie loss, promised by the weight loss program using two item nine-point scale (α = .91; 1 = not at all, 9 = very) indicating how adequate and attractive they thought the calorie loss promised by the program was. See Appendix E for full text of the dependent measures. Finally, to measure participants' chronic regulatory focus, I used two separate four-item subscales for prevention and promotion focus using items from the regulatory focus scale by Lockwood, Jordan, & Kunda (2002). See Appendix F for the full list of items. A principal components analysis revealed that the promotion and the prevention focused items loaded on two different factors. I subtracted the mean of participants' scores on the prevention focus subscale from the mean of the scores on the promotion focused subscale to create a regulatory focus index, with higher values indicating greater promotion focus.

Results and Discussion

As in study 2, I excluded five participants based on their self-reported usage of a calculating device while participating in the experiment.

Evaluation of the Calorie loss. I conducted a general linear regression with the evaluation of the Calorie loss as a dependent variable and the frame (1= aggregate, 0 = disaggregate), regulatory focus index (mean-centered), and their interaction as independent variables. This analysis found a marginally significant effect of regulatory focus (B = -.19, t (117) = -1.96, p = .05), a non-significant effect of frame (B = .57, t (117) = 1.40, p < .16), and a significant interaction effect (B = .38, t (117) = 2.01, p < .05). To probe the interaction effect further, I conducted spotlight analyses at one

standard deviation above (indicating greater promotion focus) and below (indicating greater prevention focus) the mean of the regulatory focus index. As shown in Figure 3, promotion focused participants (+1 SD) evaluated the Calorie loss more positively when it was indicated in an aggregate frame ($M_{aggregate}$ = 4.91) as compared to when it was indicated in a disaggregate frame ($M_{disaggregate}$ = 3.49, $t(117) = 2.37$, $p = .02$). However, no such difference emerged for prevention focused participants ($M_{aggregate}$ = 4.88, $M_{disaggregate}$ = 5.16, $t(117) = -.49$, $p = .62$).

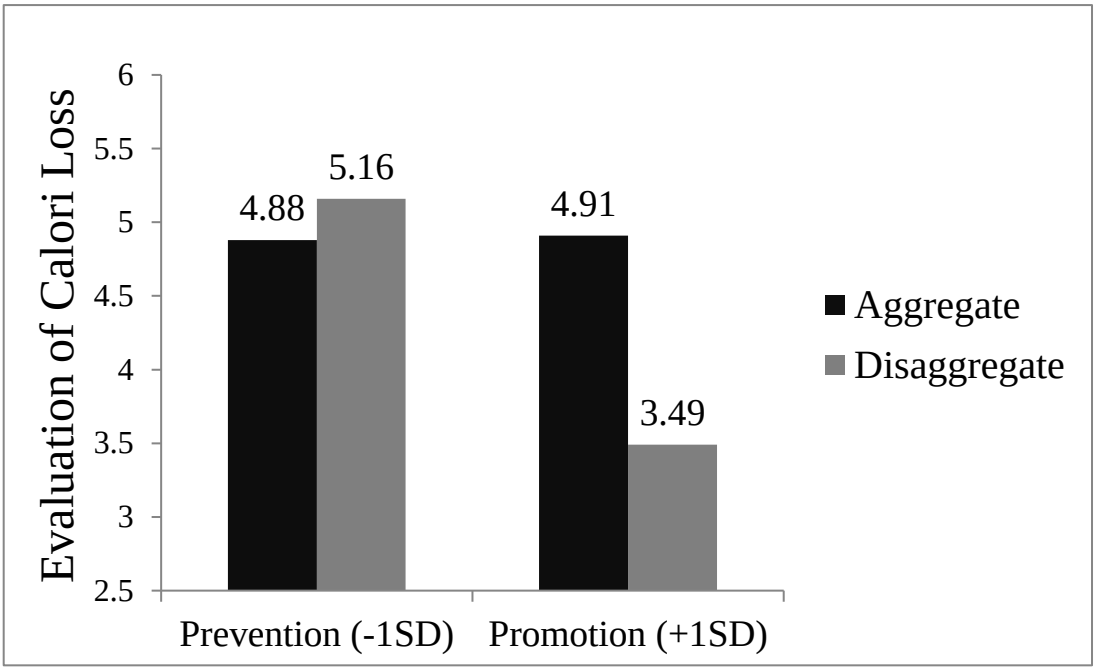

Figure 3: Evaluation of Calorie loss in Study 3 based on regulatory focus and experimental conditions

Discussion. Study 2 provided further support to my hypothesis. Promotion focused participants indicated a more positive evaluation of the Calorie loss promised by program when it was expressed in aggregate terms, the total Calorie loss, as

compared to when it was expressed in disaggregate terms, the Calorie loss per week. On the other hand, no such difference based on frame was observed for participants who were higher on prevention focus. This study provided generalizability to the hypothesis as this prediction held true in a non-financial domain. Moreover, this study was a more conservative test of the hypothesis. I ensured that the total duration of the program was available to the participants and the calculation of the equivalent benefit per week (over eight weeks) was easy in the aggregate (disaggregate) frame. Results from this study suggest that the effect was not due to differential motivation to calculate but due to lack of attention to all pieces of information. Finally, by showing the total duration of the program, I tried to address the concern that the level of aggregation may lead to different construal levels.

7. STUDY 4: THE UNDERLYING MECHANISM

Results from the first three studies provide converging evidence that regulatory focus affects the way consumers perceive temporally framed attributes. I have argued that this occurs because promotion focus leads to greater attention on the most salient aspect of the frame – the numeric expression of the attribute. As such, the attribute when expressed in an aggregate frame appears to be larger in magnitude as compared to when it is expressed in a disaggregate frame. On the other hand, prevention focus leads to attention on all aspects of the frame. Therefore, consumers reach the same conclusion about the magnitude of an attribute irrespective of the level of aggregation at which it has been expressed. In this study, I aimed to provide direct evidence for this process.

Participants viewed prize money of a lottery that they had participated in and won. Unlike a traditional lottery, the reward in this lottery was to be paid out in equal monthly payouts over a specified period. As in the previous studies, I framed the lottery at different levels of aggregation and measured participants' evaluation of the lottery. To measure the difference in the perception of the magnitude of the reward, I adopted the paradigm used by Monga & Bagchi (2012). To examine the perceptual salience of the number or the unit during the evaluation of a quantity expression, these researchers asked participants the extent to which they were focusing on the number and the units in two separate items such that participant's focus shifted to different aspects of the information. I adapted this by asking participants to make magnitude evaluation of the benefit and the time using two different items. I predicted that promotion focused individuals will pay more attention to the numeric expression of the benefit and evaluate it to be higher in magnitude when it is expressed in an

aggregate frame leading to a more positive evaluation of the lottery. However, prevention focused participants will not evaluate the magnitude of the benefit differentially based on frame, leading to similar evaluations across the two levels of aggregation.

Method

Participants and procedure. One hundred and two undergraduate students (M_{age} = 21.05 years , 50 males, 51 females, 1 unreported) from Nanyang Business School completed the survey for partial course credit. Participants were randomly assigned to one of the four conditions of a 2 (Regulatory focus: prevention/ promotion) X 2 (Frame: aggregate/ disaggregate) factorial design.

First, using the same paradigm as in study 1, I primed participants with either promotion or prevention focus using an anagram task post which, participants responded to the same manipulation check questions.

Next, in an ostensibly unrelated task, participants imagined that they were working in a company with an annual salary of $40,000 for the previous few years. The salary was mentioned to establish a baseline level of wealth (Gourville 1998). Participants then read that they had bought a ticket for their company's annual raffle and had found that they had won the lottery. However, unlike a traditional lottery where the winning amount is paid in lumpsum, this lottery paid the winning amount in equal monthly pay-outs over a fixed duration of time. In the disaggregate (aggregate) condition, participants were told that they had won a reward of "$160 a month (A total of $4,500 in equal monthly payouts) over a period of 2 years and 4 months". I did not use the exact aggregate amount in the aggregate condition as a non-rounded number

could potentially reveal the hypothesis to the participants. This is consistent with Gourville (1998). See Appendix G for full text of the stimuli.

Measures. Participants responded to a two item eight point scale indicating how adequate and attractive they felt the reward was (r = .85 ; 1 = not adequate/attractive at all, 8 = very adequate/attractive).

As discussed above, to measure the difference in the perception of the magnitude of the reward, I adapted the paradigm used by Monga & Bagchi (2012). On a single screen with two questions, participants responded to their evaluation of the two components of the reward, the winning amount and the time over which they were receiving the amount. First, on a 7-point scale, participants responded whether they felt the winning amount was 1=very low, 4= just about right, 7=very high. Next, on the same screen, participants indicated if the time period over which they were getting the winning amount was 1=very short, 4 = just about right, 7 = very long. These anchor points were adapted from Burgoon (2014). See Appendix G for full text of the dependent measures and the mediators. Although I did not manipulate time experimentally and did not expect a difference in evaluation based on condition, I included it so that the participants understand that they are evaluating the two components of the reward. However, I expected that the magnitude of the winning amount will be evaluated differentially depending on condition. A pretest of these items with a different sample suggested that participants focused on the two different components of the lottery, the benefit and the time, while responding to these items. See Appendix H for details of the pretest.

Results and Discussion

Manipulation check. Response of one participant who did not respond to all the dependent measures was excluded from the analysis. Including imputed values do not change the results. I created a similar index, as in Study 1, by subtracting participants' focus on not losing out points from participants' focus on gaining more points in the brand name quiz. Three participants responded to only one of the items of the manipulation check. I removed them from this analysis but included them in the analyses reported below. Compared to participants primed with prevention focus, those primed with promotion focus scored higher on this index, indicating a greater focus on scoring more points instead of not losing points in the brand name quiz ($M_{promotion}$ = 1.06, SD = 2.24, $M_{prevention}$ = -.2, SD = 2.73, $F(1,99) = 6.22$, $p = .01$).

Evaluation of the reward. A two-way ANOVA on participants' evaluation of the reward revealed a significant main effect of frame, $F(1,97) = 4.87$, $p = .03$ and a significant interaction between frame and regulatory focus, $F(1,97) = 5.24$, $p = .02$. As shown in Figure 4, participants primed with promotion focus evaluated the reward more positively when it was framed in aggregate terms ($M_{aggregate}$ = 6.00, SD = 1.63) as compared to disaggregate terms ($M_{disaggregate}$ = 4.37, SD = 1.66, F (1,97) = 9.83, p =.002). However, the evaluation of participants in the prevention focus condition did not differ by frame ($M_{aggregate}$ = 5.30 , SD = 2.19 $M_{disaggregate}$ = 5.33, SD = 1.74, F (1,97) < 1).

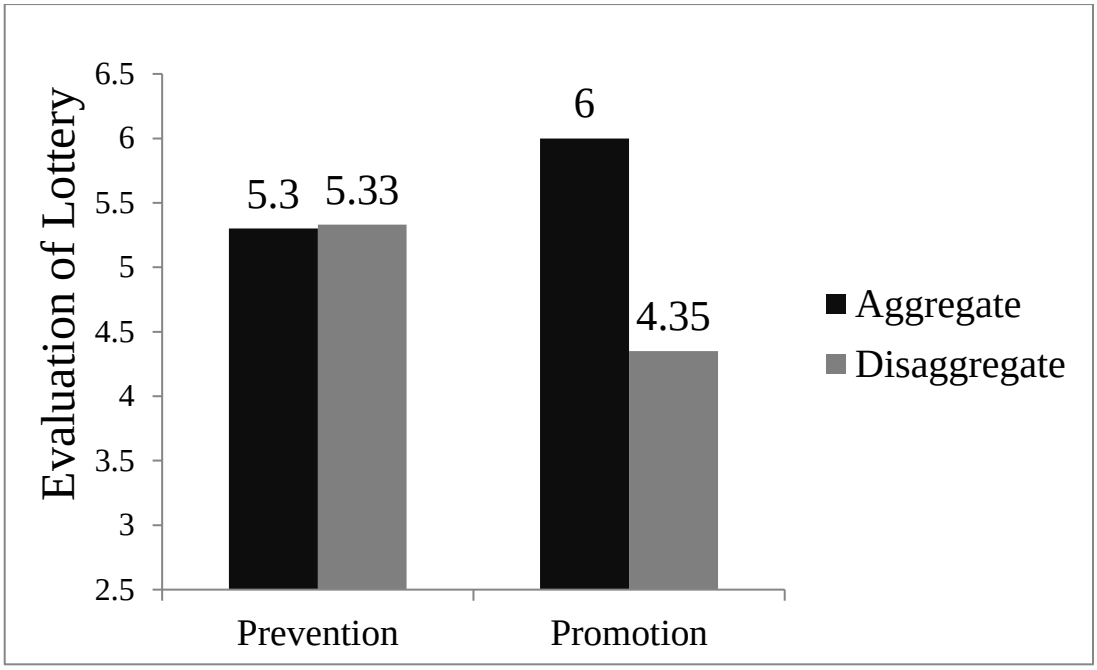

Figure 4: Evaluation of lottery in Study 4 based on regulatory focus and experimental conditions

Perception of magnitude. Next, I conducted two separate two-way ANOVAs on participants' perception of the magnitudes of the winning amount and time. As predicted, participants' perception of time over which they would receive the winning amount did not differ across conditions (all *p*'s non-significant, interaction effect, $F(1,97) = .34$, $p = .56$). However, a two-way ANOVA on the magnitude perception of the winning amount found a significant effect of frame, $F(1,97) = 6.51$, $p = .01$, and a significant interaction between frame and regulatory focus, $F(1,97) = 5.25$, $p = .02$. As shown in Figure 5, participants in the promotion focused condition evaluated the magnitude of the winning amount to be higher in the aggregate frame ($M_{aaggregate} = 5.17$, $SD = 1.23$) as compared to the disaggregate frame ($M_{disaggregate} = 3.73$, $SD = 1.38$, $F(1,97) = 11.41$, $p = .001$). No such difference as observed for participants in the prevention focused condition ($M_{aggregate} = 4.78$, $SD = 1.91$, $M_{disaggregate} = 4.71$, $SD = 1.23$, $F(1,97) < 1$). These results suggested that prevention focused participants

evaluated the magnitude of the reward equivalently irrespective of the level of aggregation at which it was expressed. However, the evaluation of promotion focused participants remained unaffected by the level of aggregation.

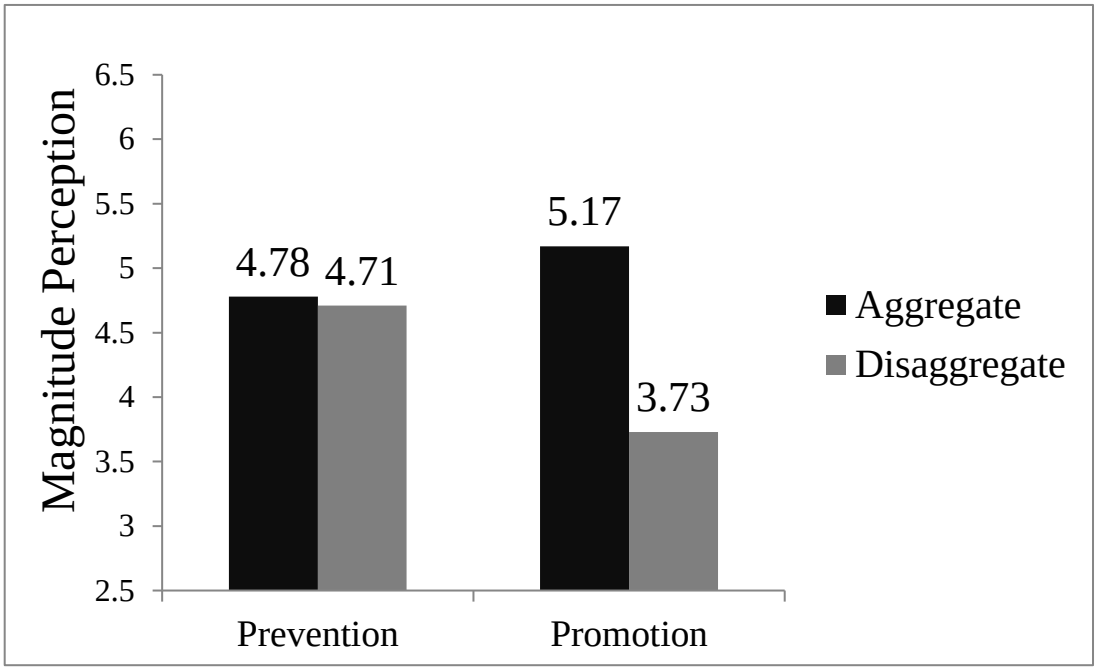

Figure 5: Magnitude perception of the winning amount in Study 4 based on regulatory focus and experimental conditions

Moderated mediation. Finally, to test my hypothesized process, I performed a moderated mediation analysis using Model 7 by Preacher & Hayes (2008). I entered frame as the independent variable, evaluation of the reward as the dependent variable, regulatory focus as a moderator, and participants' perception of the magnitude of reward amount as the mediator. Figure 6 graphically depicts this model. A bootstrapping analysis with 10,000 resamples indicated an indirect pathway through perception of the magnitude of the reward amount (*B* = -1.18, *SE* = .51, *95% CI* [-2.22, -.23]). Further analyses of conditional indirect effects revealed that the effect of frame on reward evaluation through magnitude perception was significant only in the

promotion focus condition (*B* = -1.24, *SE* = .37, *95% CI* [-2.03, -.58]) and not significant in the prevention focus condition *B* = 0, *SE* = .39, *95% CI* [-.86, .67]).

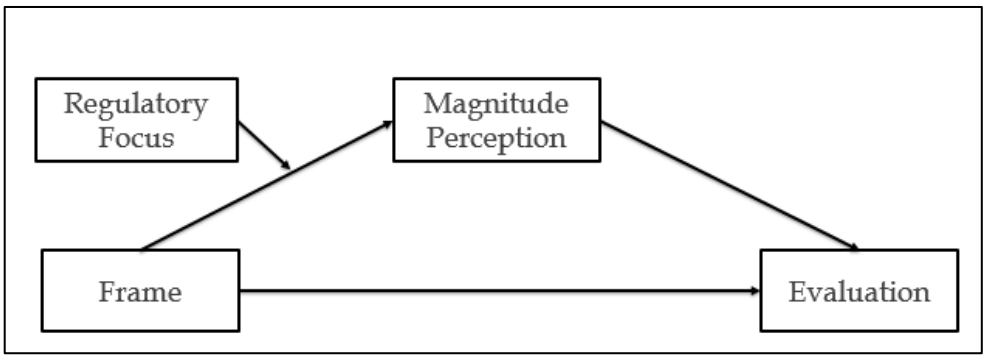

Figure 6: Model for moderated mediation in Study 4

Discussion. In addition to providing a replication of the effect observed so far, this study provides strong evidence for the underlying mechanism. The moderated mediation analysis suggests that regulatory focus affects the magnitude perception of an attribute depending on the level of aggregation at which the attribute has been expressed. Greater attention on the numeric expression of the benefit led promotion focused participants to evaluate the aggregate frame to be of a greater magnitude as compared to the disaggregate frame. This led to a higher evaluation of the lottery in the aggregate frame. However, prevention focused participants exhibited no such differences in magnitude perception leading to no differences in the ultimate evaluation of the lottery.

8. STUDY 5: COSTS

Four studies provide converging evidence to this proposition that regulatory focus affects the evaluation of temporally framed attributes. Across multiple domains, promotion focused participants evaluated an aggregate frame more positively as compared to a disaggregate frame. Prevention focused participants, however, exhibited no differences in evaluation irrespective of the level of aggregation at which they viewed the benefits. Study 4 further supported the hypothesis that differences in magnitude perception owing to the different information processing styles across the two regulatory foci underlie the differences in evaluation.

Despite the robustness of the findings, two questions remain to be answered. First, across the four studies, participants evaluated benefits and not costs. Will the hypothesized effect hold true for costs as well? Second, although Study 4 provided evidence for the underlying effect of magnitude perception based on frame, it was not sufficient to rule out an alternative, motivation-based explanation. Promotion focus leads to a greater sensitivity to benefits in general (Idson et al., 2000). Is it possible that this sensitivity and not differences in information processing may underlie the effect? This study aims to provide answers to these two questions.

In Study 5, I focus on temporally framed costs. Participant viewed a health club membership offer where the membership price was framed either in an aggregate or a disaggregate frame. I hypothesize that, as in the previous studies, promotion focused participants will pay greater attention to the numeric expression of the cost. Therefore, they will evaluate the aggregate cost more negatively as compared to the disaggregate cost. On the other hand, prevention focused participants, who pay

attention to all aspects of the frame will provide equivalent evaluations for the two frames. This is a cognitive, information processing based argument.

A motivational argument would predict the opposite. Prevention focused people are more sensitive to losses and promotion focused people are more sensitive to gains. To subscribe to the health club membership, participants would have to part with their money, a form of loss which prevention focused participants may be more sensitive to. If this is the case, prevention focused participants should evaluate the aggregate frame more negatively as compared to the disaggregate frame. Promotion focused participants, who are less sensitive to losses, should be indifferent to the two levels of aggregation. Testing the effect in the domain of price would provide me a way to test these two competing hypotheses.

I also attend to two other issues in this study. First, across studies 1, 3 and 4, where participants provided evaluation of the frames, I asked participants for attitudinal measures. In this study, my dependent measures were purchase intent, which may be a better predictor of behavior (Albrecht & Carpenter, 1976). Second, I also aimed to provide further evidence to the underlying mechanism. When purchasing any product or service, a consumer can focus more on the price that she is paying or the benefit that she is getting from purchasing the product. A consumer purchases the product only when she feels that the costs justify the benefits. In the context of temporal frames, an aggregate frame may make the cost seem greater in magnitude, leading to the perception that the benefits do not justify the costs. I hypothesize that for promotion focused participants, the greater salience on the numeric expression of the cost will lead to a perception that the costs do not justify the benefits to be gained from the health club membership. On the other hand, prevention focused participants,

who may pay greater attention to all aspects of the frame, will not exhibit this differential cost-benefit analysis across the two frames.

Method

Participants and procedure. One hundred and eighty-two female participants (M_{age} = 28.67 years, *SD* = 4.98) from the US on Amazon Mechanical Turk completed this study. Participants were randomly assigned to one of the four conditions of a 2 (Regulatory focus: prevention/ promotion) X 2 (Frame: aggregate/ disaggregate) factorial design.

First, participants completed the regulatory focus prime similar to the one described in Study 2. In the promotion (prevention) focus condition, participants wrote one goal (outcome) that they would want to achieve (avoid) and four to six strategies they would use to make sure that they achieve the goal (avoid the outcome). Participants responded to the same manipulation check question as in Study 2 wherein they indicated whether they were thinking about "my dreams" or "my fears". See Appendix I for full text of the manipulation.

Next, in an ostensibly unrelated task, participants read that they had been planning to join a health club for a while and were browsing through various health club membership plans. They then read that a particular plan caught their attention. After reading the benefits of the plan, which was same across all conditions, participants in the aggregate (disaggregate) condition read that the membership cost was "Only $1,560 ($65 a month) for a 2 year membership of our health club". To ensure equivalence across the two conditions, participants also read that they need to pay membership dues every six months.

Measures. The key dependent variable in this study was participants' likelihood of joining the health club. Participants indicated how likely and how willing they were to join the health club membership plan on a 7-point scale (1 = Very unlikely/unwilling, 7 = Very likely/willing; r = .88).

Next, to measure whether participants felt if the costs justified the benefits of the membership, participants indicated how valuable they felt the benefits were as compared to the cost of the membership plan (1 = not valuable at all, 7 = extremely valuable) on a single item measure adapted from Atlas (2013).

A consumer's willingness to pay may depend on her income. Participants responded to a single-item 101-point measure on where they stood in the society with respect to their income level with 0 being the lowest level. This was included as a covariate in all analyses.

See Appendix J for full text of the stimuli and all the measures.

Results and Discussion

Twenty participants indicated that they had used a calculating device while completing the study. However, as this exceeded more than 10% of the respondents, I did not exclude any participant from the analyses. The pattern of results described below, including the significance levels of the planned contrasts, held when these participants were removed from the analyses.

Manipulation check. As in Study 2, I coded "my dreams" as 0 and "my fears" as 1. A Chi-sq test revealed that compared to participants primed with prevention focus, those primed with promotion focus were more likely to have been thinking of

their dreams rather than their fears (*Promotion focus* = 90.33%, *Prevention focus* = 52.81% , χ^2 (1) = 33.67, $p < .0001$).

Intention to join. A two-way ANCOVA on participants' intention to join the membership plan indicated a significant effect of frame (F (1,177) = 22.96, $p < .001$), a significant interaction effect of regulatory focus and frame (F (1,177) = 4.19, p = .04), and a marginally significant effect of participants' self-reported income levels (F (1,177) = 3.07, p = .08). As has been found in previous studies on temporally framed pricing (Gourville 1998, 2003), participants indicated a higher intention of joining the membership plan when the price was expressed in disaggregate frame ($M_{\text{disaggregate}}$ = 3.66, SD = 2.03) as compared to when it was expressed in aggregate frame ($M_{\text{aggregate}}$ = 2.36, SD = 1.65).

To probe the interaction effect further, I conducted planned contrast analyses within the two regulatory focus conditions. As shown in Figure 7, promotion focused participants indicated a greater intention to join the membership plan when they viewed the price in disaggregate frame ($M_{\text{disaggregate}}$ = 3.81, SD = 2.07) as compared to when they viewed it in aggregate frame ($M_{\text{aggregate}}$ = 2.04, SD = 1.40, F (1,177) = 23.55, $p < .0001$). Contrary to my hypothesis, prevention focused participants were not immune to framing effects. The intention of prevention focused participants also followed a similar pattern as promotion focused participants, albeit with only marginal significance ($M_{\text{aggregate}}$ = 2.70, SD = 1.81, $M_{\text{disaggregate}}$ = 3.5, SD = 2.01, F (1,177) = 3.64, p = .06). This made further analyses of the effects necessary.

If regulatory focus affected the intention of joining the plan differentially based on frame, then the effect size of the differences within the two regulatory foci conditions should indicate the same. For each regulatory focus condition, I calculated

the Cohen's *d* for the differences between the mean intention across the two levels of aggregation. For prevention focused participants, the value of Cohen's *d* was .41, indicating a small to medium effect. On the other hand, for promotion focused participants, the value of Cohen's d was 1, indicating a very large effect. In other words, the effect of temporal framing on evaluation was much larger for promotion focused participants as compared to prevention focused participants.

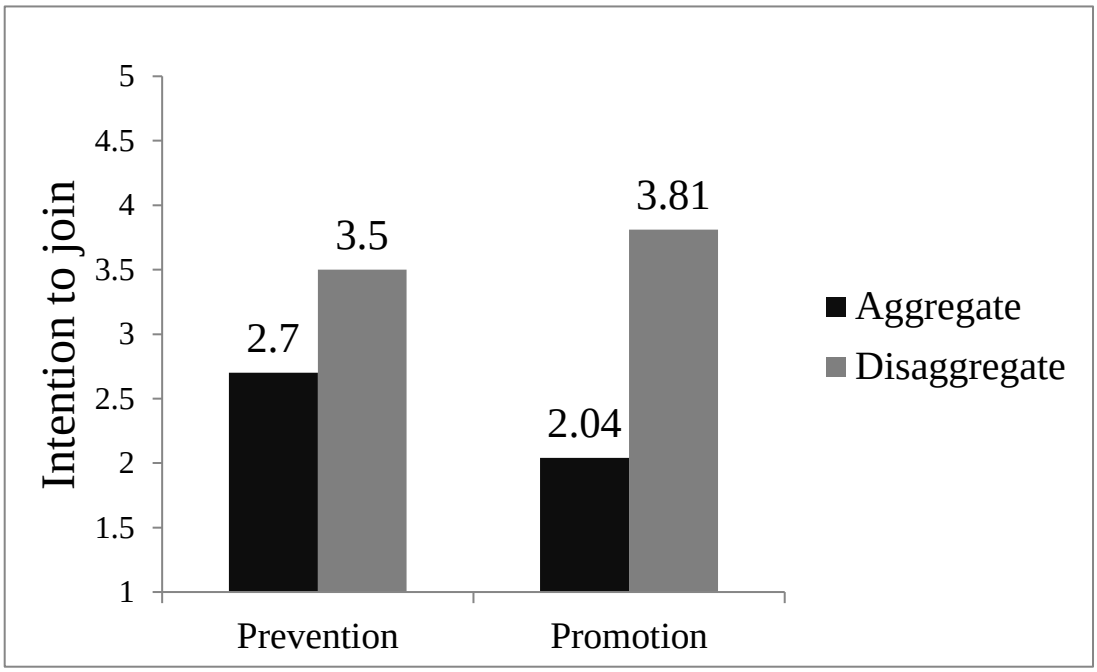

Figure 7: Intention to join the health club membership plan in Study 5 based on regulatory focus and experimental conditions

Cost-benefit comparison. Next, a two-way ANCOVA on the participants' perception of benefit with respect to the cost of the membership revealed a significant effect of frame (F (1,177) = 8.93, p = .003) and a marginally significant interaction effect (F (1,177) = 3.67, p = .06). Overall, compared to participants who viewed the

aggregate frame, those who viewed the disaggregate frame felt that benefits from the membership were more valuable than the cost of the membership ($M_{aggregate}$ = 3.15, *SD* = 1.76, $M_{disaggregate}$ = 3.94, *SD* = 1.91). To probe the interaction effect further, I conducted planned contrast analyses within each regulatory focus condition. As shown in Figure 8, promotion focused participants who viewed the disaggregate frame felt that the benefits were more valuable than the cost of the membership ($M_{disaggregate}$ = 4.00, *SD* = 1.90) as compared to those who viewed the aggregate frame ($M_{aggregate}$ = 2.73, *SD* = 1.69, *F* (1,177) = 12.17, *p* < .001). However, no such differences emerged for prevention focused participants ($M_{aggregate}$ = 3.56, *SD* = 1.74, $M_{disaggregate}$ = 3.88, *SD* = 1.94, *F* (1,177) < 1).

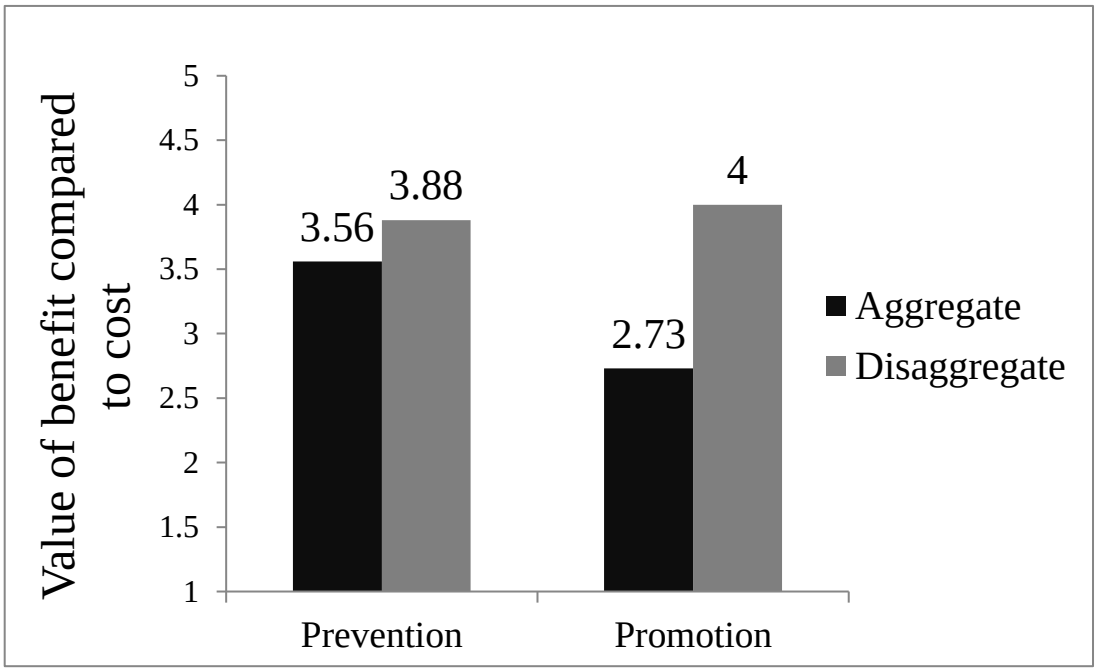

Figure 8: Participants' perception of the value of benefit compared to cost in Study 5 based on regulatory focus and experimental conditions

Mediation analysis. Promotion focused participants' greater attention to the numeric expression of the cost leads to a lower perception of the benefits available in return of the cost. This, in turn, leads to a lower intention to join the membership. I tested this moderated mediation analysis using Model 7 of Preacher & Hayes (2008). I entered frame as the independent variable, intention to join the membership as the dependent variable, regulatory focus as the moderator, the perception of benefit with respect to cost as the mediator, and participants' income level as a covariate. Figure 9 graphically depicts this model. A bootstrapping analysis with 10,000 resamples indicated an indirect pathway through the perception of benefit with respect to cost (*B* = -.80, *SE* = .42, *95% CI* [-1.67, -.01]). Further analyses of conditional indirect effects revealed that the effect of perception of benefit with respect to cost was significant only for promotion focused participants (*B* = -1.02, *SE* = .30, *95% CI* [-1.61, -.43]) and not significant for prevention focused participants (*B* = -.22, *SE* = .30, *95% CI* [-.80, .37]).

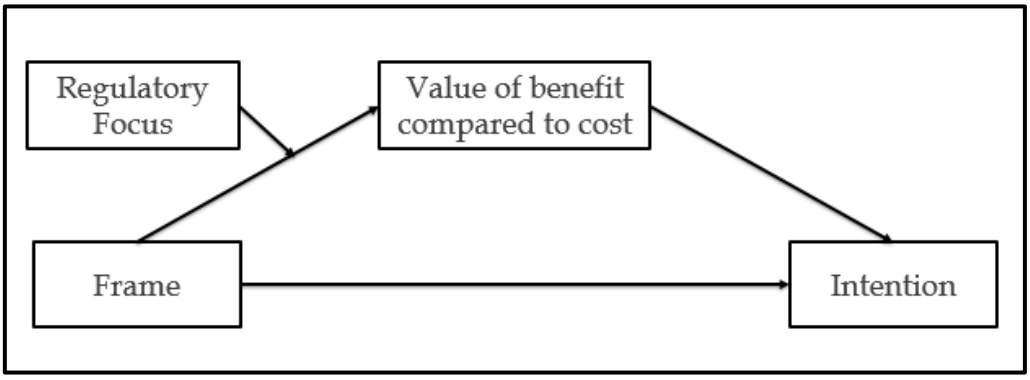

Figure 9: Model for moderated mediation in Study 5

Discussion. Regulatory focus affects the evaluation of not only temporally framed benefits but also temporally framed costs. Compared to prevention focused participants, promotion focused participants were more likely to join a membership plan when they viewed the cost in a disaggregate as compared to an aggregate frame. This provided strong evidence that differences in information processing styles, and not greater motivation elicited by either cost or benefit, underlie the effect observed across these studies. A motivational account would have resulted in an opposite finding with the effect being stronger for prevention focused participants.

This study also provides further evidence for the underlying effect. Perceiving the cost to be higher would lead to a perception that the benefits from the membership is not enough to justify the costs. This would lead to lower intention to join the membership plan. This was true for promotion focused, but not for prevention focused, participants. Combined with the findings in Study 4, this suggests that, indeed, a salient promotion focus leads to a greater reliance on the numerousness of the temporally framed attribute while making magnitude judgments.

In this study, prevention focused participants were not immune to the effects of framing. These participants also indicated higher intention to join the health club membership when they viewed the price in disaggregate frame, albeit to a much smaller degree when compared to promotion focused participants. There can be multiple reasons for this finding. It is possible that given the context of health, prevention focused participants were susceptible to using heuristics as the domain would be more relevant to them. However, if this was the case, one would expect to find a main effect of regulatory focus on intention, which was not the case. For a more plausible explanation, one would need to draw from early findings by Kahneman &

Tversky (1979) who showed that people, in general, are more sensitive to losses and pains than gains and pleasure. It is possible that in case of costs, which involves parting with one's money and enduring the pain of paying, everyone uses the numerosity heuristic to base their decision on. In general, a large number may feel like a big amount to pay. However, prevention focused consumers are better at correcting their bias and attenuating the effect of numerosity on their decision as compared to promotion focused consumers. This proposition can be further explored in future research.

9. GENERAL DISCUSSION

Five studies show that regulatory focus affects the evaluation of temporally framed benefits and costs. Promotion focused participants indicated more extreme evaluations of temporally framed benefits and costs (more favorable for benefits and unfavorable for costs) when they viewed an aggregate frame as compared to when they viewed a disaggregate frame. However, there was no difference in evaluation of prevention focused participants. Study 1 found that promotion focused participants evaluated their own salary more positively when it was framed in yearly (aggregate) terms as compared to when it was framed in monthly (disaggregate) terms. This finding can have several significant downstream consequences and Study 2 tested one such consequence. In Study 2, promotion focused participants were more likely to invest in a retirement saving scheme when they initially saw their salary framed in yearly (aggregate) as compared to monthly (disaggregate) terms. However, as in Study 1, the saving intention of prevention focused participants did not depend on the frame in which they viewed their salary. Study 3 replicated the findings in a different domain. Female participants viewed an advertisement which stated the calories which could be burnt in an 8-week weight loss program either in aggregate (total calories burnt over 8 weeks) or a disaggregate frame (calories burnt ever week). Participants' chronic regulatory focus predicted their evaluation of the weight loss program. While promotion focused participant evaluated the program more positively when they saw the total calories that could be burnt (aggregate frame), prevention focused participants evaluated the program similarly irrespective of the level of aggregation of the claim.

Studies 4 and 5 explored the underlying mechanism for the phenomenon. Consistent with results from the previous studies, Study 4 showed that promotion (but

not prevention) focused participants evaluated the reward from a lottery more positively when they saw the reward in an aggregate frame (total reward amount) as compared to a disaggregate frame (monthly reward amount). Further, I found evidence for the underlying mechanism for biased magnitude perception. Promotion focused participants evaluated the magnitude of the reward based on the largeness of the number used to describe the reward whereas prevention focused participants did not. This magnitude judgment, in turn, led to the differential evaluation of the lotteries based on the level of aggregation. Finally, Study 5 tested the phenomenon in the context of a temporally framed cost. Promotion focused participants indicated that they were more likely to join a health club when they viewed the membership costs in a disaggregate as compared to an aggregate frame. However, frame did not affect the intention of prevention focused participants. This study also explored the underlying mechanism of biased magnitude judgment using a different measure. Promotion focused participants who viewed the disaggregate frame (compared to those who viewed the aggregate frame) indicated that they perceived the benefits of the membership to be more valuable than the costs, indicating that they perceived the cost to be low. However, no such difference in magnitude perception emerged for prevention focused participants. A mediation analysis revealed that this biased magnitude perception predicted participants' intention to join the club.

Thus, the hypothesized effect was supported across a wide range of contexts, for both chronic and situationally induced regulatory focus, and for both costs and benefits, suggesting that the effect is robust and generalizable.

Contributions

This research makes multiple contributions to the area of consumer decision making. First and foremost, it contributes to the area of choice architecture (Johnson et al., 2012; Thaler & Sunstein, 2008). Attribute design is an important element of choice architecture (Bond et al., 2008; Larrick & Soll, 2008; Soll, Keeney, & Larrick, 2013). Minute differences in the way attributes are framed may affect consumer decisions. When framing temporal attributes, the choice architect may aggregate the benefit over a longer period of time (or disaggregate the cost over a shorter period) with the hope that the perceived largeness (smallness) of the benefit (cost) may nudge the consumers towards that option. However, in this research, I show that the decision maker's regulatory goal is an important determinant of the success of such an attribute design strategy. When the decision maker is prevention focused, she may engage in a detailed and piece-meal style of processing the frame, paying attention to all relevant aspects, and hence, may become immune to the effect of framing.

Next, it contributes to current understanding of the usage of numerosity heuristic, a critical decision making bias (Pelham et al., 1994), which underlies multiple phenomena in the judgment and decision making literature (Bagchi & Davis 2016). Findings from this research suggest that regulatory focus is an important boundary condition to the usage of numerosity heuristic. Prevention focused participants were less likely to use the largeness of a numeric expression to make quantity judgments. Furthermore, prior research has sought to debias decision makers from using this heuristic by making them process all relevant information instead of just the most salient piece of information. This has been done by making such information easier to process, either by the usage of graphical cues (Shen & Urminsky,

2013; Stone et al., 2003) and increasing the ease of calculation (Bagchi & Davis, 2012). This research suggests that a inducing prevention focus can also act as a debiasing tool and help people make better decisions.

I also contribute to the nascent literature on temporal reframing (Gourville, 1998, 1999, 2003; Burson et al., 2009; Goldstein et al., 2016). Prior literature has focused only on demonstrating the effect, and in some cases, such as Goldstein et al. (2016), providing indirect evidence for the underlying mechanism. This research shows for the first time that biased magnitude perception, a fallout of the usage of numerosity heuristic, drives the perception of temporal frames. Further, unlike prior research which focused on the largeness of the disaggregate amount as a boundary condition, I show that the effectiveness may depend on situational factors, such as a prevention focus inducing goal, message, or product, or even a factor central to the decision maker, such as chronic prevention focus. Additionally, findings from Study 2 contribute to the "illusion of wealth" effect reported by Goldstein et al (2016) which suggests that viewing a future stream of income in aggregate terms makes it less likely for people to add to that income. Apart from identifying a boundary condition, findings from Study 2 suggest that the effect may occur even when people view their current stream of income in aggregate terms.

Finally, I contribute to the literature on regulatory focus theory by showing that promotion focused people may be more prone to use decision making heuristics, especially those that stem from non-detailed information processing. While prior research has examined the way the strategic inclinations and goals related to the two regulatory foci affect decision making (e.g., Crowe & Higgins, 1997; Scholer et al., 2010; Zou et al., 2014), this literature has not explored the way information processing

styles elicited by the regulatory foci affects the usage of decision heuristics (but see Weaver et al., 2012 for an exception). In this research, I show that promotion focused individuals are more prone to use the numerosity heuristic, which results from focusing only on the most salient aspect of a numeric frame. This suggests that similar findings may be expected for other processing based decision making biases such as the base rate neglect (Bar-Hillel, 1980), anchoring effect (Tversky & Kahneman, 1974), and the availability heuristic (Tversky & Kahneman, 1973).

Findings from my dissertation also have important implications for managers and policy makers. Temporal framing of information is an important tool used in the industry. Multiple retailers, charities, and service providers frame their prices either in aggregate ('dollars per year') or disaggregate ('dollar a day') frames. Similarly, many benefits get framed at different levels of aggregation in the health and wellness industry. When framing costs in disaggregate terms, such as pennies-a-day pricing, the aim of the marketer is to reduce the pain of paying. On the other hand, when benefits are framed in aggregate terms, the aim is to increase the perceived magnitude of the benefit. The current research suggests that whether this intention of the marketer is realized may depend on the regulatory focus of the consumer. This marketing strategy may be successful only with promotion focused consumers. However, prior research has shown that promotion focus can be induced by message framing (Zhu & Meyers-Levy, 2007) or by certain products (Mourali, Böckenholt, & Laroche, 2007). Temporal reframing may be a useful marketing tool for such advertisements and products. Furthermore, findings from Study 2 suggest that aggregating benefits may sometimes lead to undesirable effect. For example, promotion focused participants who view a weight loss program where they can lose 10 pounds over 10 weeks may be more likely to eat unhealthy food as they would feel that they would lose a lot of weight by

enrolling in the program. The findings also provide important insights for policy makers. My findings suggest that using temporal frames for communicating socially desirable behavior, such as reducing obesity and encouraging financial prudence, may not be fruitful for a large part of the population, the ones who are chronically prevention focused.

Directions for Future Research

Evidence for attentional mechanism. In this research, I show that biased magnitude perception owing to the usage of numerosity heuristic underlies the effect of framing on attitude; prevention focus leads to the non-usage of this heuristic. However, a more basic mechanism for the phenomenon is the visual attention paid to the various components of the frame. Future research can explore this using eye-tracking. An experiment following the paradigm described above, but conducted on an eye-tracking platform, may provide more direct evidence for this attentional mechanism. In such an experiment, promotion focused participants may pay greater visual attention to the numeric expression of the benefit while prevention focused participants' visual attention may be directed to all the components of the information equally.

Order effects. I do not explore if the presentation order of the two components – the benefit and the time period – has any effect on attitude. Prior research on order effects suggest that the saliency of background information may be increased by presenting it before the foreground information. For example, Bagchi & Davis (2012) showed that when evaluating multi-item package, the saliency of the price can be reduced if the number of items is presented first (i.e., presenting 70 items for $29 instead of "$29 for 70 items"). I predict that such presentation order will attenuate the

effect of temporal reframing for promotion focused consumers as it will make them notice the time over which the cost or benefit accrues. The interactive effect of order presentation, frame, and regulatory focus can be explored in future research.

Cultural differences in information processing. Prior research has documented that individuals from Eastern, collectivistic cultures are more prevention focused that their Western counterparts (Lee et al., 2000). Given this finding, one may predict that the cross cultural differences would follow from the pattern demonstrated in this research. However, a separate stream of literature suggests that Easterners process information more holistically and focus their attention on the most salient aspect of any information (Kuhnen & Oyserman, 2002). As such, they are expected to behave more as promotion focused participants in the current studies. These conflicting predictions suggest that self-construal and regulatory goals may lead to opposite types of information processing depending on some situational variables. Future research can explore such situational factors which may not only help understanding the effect of culture on temporal reframing, but also the way culture and regulatory goals interact and lead to different information processing styles.

Unequal disaggregate costs or benefits. In this research, I have explored cases where the disaggregate cost or benefit remains equal per unit time. However, there may be instances when consumers face a variance in the amount across the time period. For example, a loan EMI may include only principal for the first 12 months and may step up to include the principal and the interest post 12 months. How do promotion and prevention focused consumers view such a variance? I predict that promotion focused consumers will have a more extreme evaluation of such a variance as they will focus on the change in benefit or cost. However, prevention focused

consumers, who are likely to take time and level of aggregation into account in their evaluation may have a less extreme evaluation for such a variance.

Differences across regulatory foci: Across the studies, I only test the differences between the perception of the aggregate and disaggregate frame within each regulatory focus condition. However, is it possible that the same frame is perceived differently within the two regulatory focus conditions? While I do not have an a priori prediction for this, analyzing the pattern of results for the magnitude perception measure, the underlying variable, from studies 4 and 5 suggest that this may be the case. In study 4 exploring benefits, the promotion-aggregate was at the same level as the two prevention focus conditions and the results were driven by promotion disaggregate condition. In Study 5 exploring costs, the reverse was true. The promotion-disaggregate condition was at the same level as the prevention focus conditions and the results were driven by promotion-aggregate condition. So, it is possible that when prevention focused consumers view benefits (costs) in a disaggregate (aggregate) frame, their response is to aggregate (disaggregate) the attribute over time. Promotion focus consumers, viewing the same frame fail to do so, leading to a biased judgment. This predicted difference may be tested in future studies.

Costs versus benefits. In this research, I examined the effect for both temporally framed costs and benefits. Across the studies, the level of aggregation affected promotion focused participants more than prevention focused participants. However, reported in the last study, in the domain of costs, prevention focused participants were not immune to the effect of framing. This provides an important direction for future research. Does the usage of numerosity heuristic differ depending on whether the number describes a cost or a benefit? Prospect theory (Kahneman &

Tversky, 1979) suggests that a loss may lead to almost twice as much pain as the pleasure from an equivalent gain. It seems that in the domain of costs, this aversion to the pain of paying may lead even vigilant processors, the prevention focused individuals, to rely on the numerosity heuristic, albeit to a much lesser extent when compared to promotion focused people.

Marketplace relevance. Across the studies, I have used attitude and intention measures as the outcome variables. However, to make these findings more managerially relevant, I propose to undertake studies with actual behavior as the outcome. Given the tradition of framing research, it may not be possible to provide participants with both aggregate and disaggregate frames as it may make the research question apparent. However, a study measuring behavioral outcomes (e.g. choice share, money contributed) with temporally framed advertisements (e.g. donation appeals) coupled with differing regulatory focus messages can provide actual evidence that the findings can translate into marketplace actions. Moreover, instead of using incidental ways of inducing regulatory focus, such a study can show that integrating regulatory focus message into advertisements can also lead to similar results.

Conclusion

In conclusion, in this research, I examined the impact of regulatory goals on the evaluation of temporal reframing of benefits, a widespread strategy used by marketers. I showed that temporal frames may affect the evaluation of promotion focused consumers only. I hope that these findings will encourage more research on other factors which may affect the perception and evaluation of temporal frames.

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APPENDIX A

Regulatory focus manipulation and manipulation check used in Study 1

Participants in the promotion (prevention) focus condition read:

This is a word unscrambling game. You will be required to unscramble 10 famous brand names. There are points for this task (explained in the next page).

Each correctly (incorrectly) unscrambled name gains (loses) you 2 points. If you don't get a name correct (wrong), you will not gain (lose) 2 points.

Your goal is to gain (lose) as many (few) points as possible by maximizing (minimizing) the number of names you get right (wrong).

For every brand name you get right (wrong), you will gain (lose) 2 points. For every brand name that you don't get right (wrong), you won't win (lose) 2 points.

Examples of scrambled brand names

MANOAZ - AMAZON

RTIEG - TIGER

BCOC - OCBC

SUASCTKBR – STARBUCKS

Manipulation checks

1. Indicate the extent to which you focused on scoring more points when playing the brand name quiz?

2. Indicate the extent to which you focused on not losing any points when playing the brand name quiz

1 = Very small extent, 8 = Very large extent

APPENDIX B

Stimuli and dependent measures used in Study 1

Participants in the disaggregate (aggregate) condition read:

Imagine you have finished your undergraduate program and you have joined a large multinational company. You have been working in the company for the previous few months and you are satisfied with your job.

The company follows a monthly pay cycle (i.e. salary paid once every month), and your current compensation package is $3,000 per month for the first year **(**total fixed salary of $36,000 for the first year) and a possible revision of salary after that based on your performance.

Dependent measures

1. How attractive do you think the salary offered by the company is?

Very unattractive, Moderately unattractive, Somewhat unattractive, Neither attractive nor unattractive, Somewhat attractive, Moderately attractive, Very attractive

2. How adequate do you think the salary offered by the company is?

Very inadequate, Moderately inadequate, Somewhat inadequate, Neither adequate nor inadequate, Somewhat adequate, Moderately adequate, Very adequate

APPENDIX C

Regulatory focus manipulation and manipulation check used in Study 2

Participants in the promotion (prevention) focus condition read:

Think about one goal you strongly want to achieve (one outcome you strongly want to avoid) this year and type it out in the space provided below

_____

Now please think of 4 to 6 strategies you would use to make sure you achieve the above goal (avoid the above outcome)

_____

_____

_____

Manipulation check

That was the end of the Planning Task.

Before we move to the next task, please complete the following statement:

"Right now, I am thinking about _____"

Choice: My dreams/ My fears

APPENDIX D

Stimuli and dependent measures used in Study 2

Participants in the disaggregate (aggregate) condition read:

Imagine that you have been on the look out for a new job for the previous few months and you finally accepted a job offer which you like.

The company, which follows a monthly pay cycle (i.e. salary paid once every month), has offered you a fixed salary of $ 3,500 per month for the next 1 year (a total fixed salary of $ 42,000 for the entire year for the next 1 year) and a possible revision of salary after that based on performance.

Investment Plan

As an initiative to encourage its employees to save more for their retirement, the company has an optional low-risk investment plan.

Employees can decide the amount of money they want to invest per month in this plan. The amount decided by the employee will be deducted for his or her monthly salary and invested in this investment plan.

Dependent measures

1. How likely are you to invest in this optional investment plan?

1 = Not likely at all, 9 = Very likely

2. How probable is it for you to invest in this optional investment plan?

1 = Not probable at all, 9 = Very probable

3. How plausible is it for you to invest in this optional investment plan?

1 = Not plausible at all, 9 = Very plausible

4. What are the chances that you will invest in this optional investment plan?

1 = No chance at all, 9 = Very high chance

APPENDIX E

Stimuli and measures used in Study 3

Participants in the disaggregate (aggregate) condition read:

Imagine that you come across an advertisement for a weight loss program.

This 8-week program combines healthy diet and exercise, which helps people burn approximately equal number of Calories every week.

The tag line for the advertisement is:

Join our program and burn 800 Calories per week over the next 8 weeks.

(Join our program and burn 6400 Calories over the next 8 weeks.)

Dependent measures:

1. How attractive do you think is the Calorie loss promised by the program?

1 = Very unattractive, 5 = Neither unattractive nor attractive, 9 = Very attractive

2. How adequate do you think is the Calorie loss promised by the program?

1 = Very inadequate, 5 = Neither inadequate nor adequate, 9 = Very adequate

APPENDIX F

Regulatory focus scale used in Study 3

How true are these statements about you? (1 = Not true at all, 9 = Very true)

Prevention focus

1. In general, I am focused on preventing negative events in my life.
2. I am anxious that I will fall short of my responsibilities and obligations.
3. I often think about the person I am afraid I might become in the future.
4. I frequently think about how I can prevent failures in my life.

Promotion focus

1. I frequently imagine how I will achieve my hopes and aspirations.
2. I often think about the person I would ideally like to be in the future.
3. I typically focus on the success I hope to achieve in the future.
4. I often imagine myself experiencing good things that I hope will happen to me.

APPENDIX G

Stimuli and measures used in Study 4

Participants in the disaggregate (aggregate) condition read:

Imagine that you are working in a company for the last few years and your current salary is $40,000 per year. You intend to keep working for this company for the next few years.

A month back you bought a ticket to participate in your company's annual raffle (lottery). You have just found out that your ticket has been declared the winning ticket and you will receive the winning amount for the lottery.

However, unlike a traditional lottery reward which is given in lumpsum, your company has decided to give you the reward in equal monthly payouts over a certain time period.

Imagine that you receive a lottery reward of:

$160 per month over a period of 2 years and 4 months. (A total of $4500 in equal monthly payouts over a period of 2 years and 4 months.)

Dependent measures

How adequate do you think this reward is?

1 = Not adequate at all, 8 = Very adequate

How attractive do you think this reward is?

1 = Not attractive at all, 8 = Very attractive

Mediators

What do you feel about the winning amount that you are receiving?

1 = Very low, 4 = Just about right, 7 = Very high

What do you feel about the time period over which you will receive the winning?

1 = Very short, 4 = Just about right, 7 = Very long

APPENDIX H

Pretest of mediator used in Study 4

After reading either the aggregate or the disaggregate stimuli from Study 4 and responding to the two mediator questions, participants read:

The lottery had two components, the reward amount and the time over which you would get the reward amount.

While responding to the two questions on the previous screen, to what extent did you feel you were evaluating the respective component for each question separately (i.e. reward for the first question and time for the second question).

0 = Did not feel at all, 4 = Felt to a large extent

Results

The mean on this measure was significantly different from 0, $M = 3.74$, $SD = 1.03$, $t(98) = 36.08$, $p < .0001$, indicating participants felt that the two questions asked about two different components of the lottery reward. Participants' response did not depend on whether they viewed the aggregate or disaggregate frame, $t(97) = .36$, $p = .72$.

APPENDIX I

Regulatory focus manipulation used in Study 5

Participants in the promotion (prevention) focus condition read:

Think about one goal you strongly want to achieve (one outcome you strongly want to avoid) and type it out in the space provided below

_____

Now please think of 4 to 6 strategies you would use to make sure you achieve the above goal (avoid the above outcome)

_____

_____

_____

Manipulation check

That was the end of the Planning Task.

Before we move to the next task, please complete the following statement:

"Right now, I am thinking about _____"

Choice: My dreams/ My fears

APPENDIX J

Stimuli and measures used in Study 5

Participants in the disaggregate (aggregate) condition read:

Imagine that you have been planning to join a health club for some time now. As you browse through the benefits and costs of various health club membership plans, a particular plan catches your eyes.

This membership gives you access to the gym and sports facilities of a well known health club. It also provides other services such as a personal diet plan and access to special classes on yoga, dance cardio, Pilates etc. For this plan, you need to pay membership dues every 6 months.

In its advertisement, the health club mentioned:

Only $65 a month for a 2 year membership of our health club.

(Only $1,560 for a 2 year membership of our health club.)

Dependent measures

1. How likely are you to join the health club membership plan?

Very unlikely, Moderately unlikely, Somewhat unlikely, Neither likely nor unlikely, Somewhat likely, Moderately likely, Very likely

2. How willing are you to join the health club membership plan?

Very unwilling, Moderately unwilling, Somewhat unwilling, Neither willing nor unwilling, Somewhat willing, Moderately willing, Very willing

Mediator

1. Overall, how valuable are the benefits as compared with the cost of the membership?

Not valuable at all, A little bit valuable, Somewhat valuable, Moderately valuable, Quite valuable, Very valuable, Extremely valuable