

IMAGINE THIS: A TEST OF IMAGINATION, MESSAGE FRAMING AND
REFERENCE-LEVEL ON ATTITUDE, SELF-EFFICACY AND INTENTION TO
PERFORM EXERCISE

BY

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THESIS

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ABSTRACT

Public service announcements and health promotion ads frequently ask viewers to imagine the consequences that may occur if the viewer does not engage in the recommended health behavior (e.g., regular exercise, quitting smoking). Sometimes these messages are designed to emphasize negative outcomes associated with inaction (i.e., loss-framed messages), while other messages emphasize positive outcomes associated with behavior change (i.e., gain-framed messages). Message designers also choose whether to create messages that refer directly to the audience (i.e., uses second person) or that refer to other people in general (i.e., uses third person). Understanding how the combination of imagination, potential future losses or gains, and direct or indirect references to the viewer influence how viewers respond to these messages has important theoretical and practical implications about their effectiveness.

This thesis presents the results of a 2 x 2 x 2 between-subjects experiment that tested the effect of imagination (imagination, non-imagination), message framing (gain, loss) and reference-level (self, other) on outcomes of interest to health communication practitioners (e.g., attitude, self-efficacy, behavioral intention). Participants ($N = 275$) read a message about the importance of regular exercise and physical activity. Imagination was operationalized by telling participants to imagine themselves in the future experiencing the benefits or consequences of exercising or not exercising regularly. Message framing was operationalized using gain-framed messages that emphasized potential benefits of exercise (e.g., living longer, avoiding heart disease) or loss-framed messages that emphasized potential consequences of inactivity (e.g., dying prematurely, suffering from heart disease). Reference-level was manipulated by using

second-person pronouns (e.g., you, your) that referred directly to the participant or third-person pronouns (e.g., they, their) that referred to people in general.

Results of inferential statistical analyses revealed that when participants were asked to imagine the future, loss-framed other-referencing messages and gain-frame self-referencing messages produced significantly more favorable attitudes, and higher ratings of perceived behavioral control and self-efficacy. When participants were not asked to imagine the future, self-referencing messages produced more favorable attitudes, and higher ratings of perceived behavioral control than other-referencing messages regardless of message frame. One important implication of the findings is that when health communication practitioners attempt to strengthen messages by asking viewers to imagine themselves experiencing future outcomes, they might unintentionally cause viewers to have lower evaluations of key variables associated with performing health behaviors. Additional theoretical and practical implications, study limitations, and future research avenues are discussed.

Keywords: imagination, message framing, self-referencing, self-efficacy, physical activity, advertising, health, theory of planned behavior

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CHAPTER 1: INTRODUCTION

1.1 INTRODUCTION

“Rewind The Future” and “Measure Up” are two health advertising campaigns that encourage viewers to exercise regularly and to adopt healthy eating habits, and they have been seen by millions of people. Both campaigns represent one of the key topics in this thesis—the use of imagination. The “Rewind the Future” campaign was created by Children’s Healthcare of Atlanta as an effort to raise awareness about potential negative effects of obesity and a sedentary lifestyle (Rewind the Future, 2013). The ad was produced using the point of view of a man being rushed into the emergency room because he is having a heart attack. As the man is lying on his back looking up at a doctor, the doctor asks, “How the hell did that happen?” The ad then shows a series of short scenes in which the man regularly eats fast food (e.g., donuts, pizza), drinks soda, and neglects to exercise (see Figure 1).

Ads for Australia’s “Measure Up” campaign also use characters experiencing the effects of not exercising or eating a healthy diet (Chapman, 2009). For example, in one of the ads, a man talks about how over time he became less active and more complacent about his eating habits. As he walks toward the camera, his body transforms becoming heavier and flabbier until at the end of the ad he says he cannot even play with his daughter due to his poor health (see Figure 2).

While the perspectives are different (first person, third person), the basic message strategy is the same—the ads illustrate the bad things that can happen if you are not physically active and have poor dietary habits. The underlying assumption seems to be that these ads will help viewers imagine themselves in similar situations if they do not

change their behavior. This representation of what could happen in the future is then expected to motivate changes in current behavior.

Using imagination is a potentially powerful message strategy. For example, when people imagine themselves in future scenarios, they believe the imagined event has a higher probability of occurring (Gregory, Cialdini & Carpenter, 1982). Researchers have also manipulated the perspective imagined with a first-person or third-person (bird's eye view) perspective of themselves (Libby, Shaeffer, Eibach & Slemmer, 2007). This would be roughly analogous to comparing "Rewind the Future" to "Measure Up," as these campaigns shows the consequences of poor exercise and eating habits from a first- or third-person perspective.

In addition to using or not using imagination and changing the perspective from first to third person, message designers have to decide whether to focus on positive things that could happen in the future or negative things that could happen and thus to be avoided (Rothman & Salovey, 1998). Message framing is informed by prospect theory (Kahneman & Tversky, 1979) where gain-framed messages are operationalized as messages that emphasize the positive outcomes of engaging in a behavior while loss-framed messages are operationalized as messages emphasizing the negative outcomes of abstaining from a behavior.

Interestingly, most imagination research does not use a control condition in which participants receive the same information without being instructed to imagine. In practice, the reason why message designers use this type of manipulation could be a well-intentioned attempt to increase the effectiveness of loss-framed messages that reference the self. One of the reasons this could not actually occur is that people who imagine

themselves in future scenarios believe the imagined event has a higher probability of occurring (Gregory et al., 1982). Other times when we imagine ourselves in a third-person perspective doing something in the future, we have a higher intention to perform that behavior (Libby et al., 2007). These two pieces of information suggest that imagining the self could be different than considering possibilities about the future for oneself (or someone else). Another difference between past research and this present research is that previous research uses neutral actions and does not specify consequences such as potential gains or losses from action or inactivity (Libby et al., 2007).

The main question being addressed in this thesis is how imagination influences or functions as a variable along with standard variables such as message framing and reference-level. The goal for studying this in an experimental setting is to explore what happens when standard advertising messages that go over facts about health and exercise are instead presented as outcomes for the viewer to visualize rather than consider as a possibility. The hypothesis was that messages that ask readers to imagine, will be most effective when gain-framed messages are self-referencing or loss-framed messages are other-referencing. This was hypothesized because when operating in gain-frames, people are risk averse thus referencing the self makes the messages more relevant to the reader. While in loss-frames people are risk seeking, meaning they will be able to learn from the mistakes of someone else and develop higher evaluations of outcome variables than if the message was about themselves being risk seeking. Additionally, it was hypothesized that messages that do not ask readers to imagine, will produce the highest evaluations of outcome variables when they are self-referencing regardless of message framing. This was hypothesized because when messages are being considered as a possibility instead of

imagined as an inevitability, risk seeking behaviors and risk averse behaviors do not form as memories. Memory and imagination use the same cognitive processes (Levine et al., 1998). Thus when people consider risk aversion or risk seeking, they do not form attitudes based on behaviors from their memories. The idea of memories leading to attitude formation comes from self-perception theory which posits that previous behaviors lead to attitude formation (Bem, 1973).

This thesis begins by outlining how imagination has been used in past research and then discussing two other variables (message framing and reference-level) that are essential to health advertising campaigns and research on imagination, respectively. This is a basic exploratory method to test the effects of evoking imagination. The method by which this research was conducted is discussed in detail including pretesting of message framing. This is followed by a plan of analysis and a results section that analyzes the data gathered during the experiment. The paper concludes with a discussion of the results, theoretical as well as practical implications and a limitations and future research section.

CHAPTER 2: LITERATURE REVIEW

2.1 IMAGINATION

Imagination can be defined conceptually as a person's capacity to construct a mental representation of an abstract object (Beres, 1960). When people imagine scenarios, this can influence behavioral intentions (Anderson, 1983). When imagining scenarios, imagining the self leads to the greatest attitude change, especially when compared to imagining a close or distant other (Anderson, 1983). When people imagine events, this can influence the expectations one has for the event when it occurs (Carroll, 1978). This is related to how when people imagine scenarios that are self-relevant they are perceived as more probable to actually occur (Gregory et al., 1982).

Self-perception theory provides one possible explanation for how imagining a future event can influence current attitudes and behaviors. Self-perception theory shows evidence that recollection of past behaviors can serve as the antecedents to attitude formation (Bem, 1973). From self-perception theory, it can be seen that memories of past behaviors influence our formations of attitudes where we tend to have attitudes that conform to our memories of our behaviors (Bem, 1973). For example, if someone is asked about their attitude towards brushing their teeth and they brush daily, they are likely to say they have a favorable attitude towards brushing. Self-perception theory has been shown to apply to attitude formation through behaviors performed vicariously as well as by the self (Goldstein & Cialdini, 2007). This suggests that when people view advertising about behaviors, it could influence attitudes for how they see themselves in their mind altering their self-perception. Evidence of the connection between imagination and previous experience leading to attitude formation can be that many of the same

cognitive processes that are used for memory are also employed during imagination (Levine et al., 1998). Essentially, imagining creates a memory.

One weakness in the current literature is that most studies only contain an imagination condition. Imagination is not paired with complementary non-imagination conditions. Most studies use imagination as a part of the methodology across all conditions. This could cause issues of understanding exactly what is happening with outcome variables because there are effects from imagination on attitude and intention (Anderson, 1983; Gregory et al., 1982). For example, this means that we do not have a comparison of what happens when people are asked to consider an outcome as a possibility rather than imagining it as an inevitability. When we imagine, this creates a memory which could possibly influence attitudes through mechanisms explained in self-perception theory. Another example is that we do not know if certain types of message frames are better or worse when imagining or not imagining. This could be important as a simple messaging tweak could have a big difference. The variable of message framing will be explained in the next section.

2.2 MESSAGE FRAMING

While there are a number of ways to define message framing, for this thesis message framing is defined as “an induced shift in reference level” which characterizes manipulations like those in prospect theory (Treadwell & Lenert, 1999, p. 348). Message framing is based on Prospect Theory (Kahneman & Tversky, 1979), which posits that potential gains or losses influence how humans behave and the choices they make, so messages are “framed” to emphasize possible positive or negative outcomes based on whether or not someone takes a recommended action. The use of framing gives valence

to outcomes while still allowing for situations that are equivalent for research purposes (Kahneman & Tversky, 1979). One of the key details here is that when people operate in the domain of losses, they are risk seeking and when they operate in the domain of gains they are risk-averse (Rothman & Salovey, 1997). Meaning in gain-frames, they are averse to risks when the consequences are well understood and when they are operating in a loss-frame, they are seeking those risks. Being risk averse means not fearing the risks because of the actions taken while risk seeking is not avoiding the risk for some other potential outcome.

Some of the earliest work applying message-framing to health behavior change shows inconsistent results (O'Keef & Jensen, 2007), but some of this inconsistency can be resolved by clearly defining when actions are illness-detecting or health-affirming (Rothman & Salovey, 1997). Exercise would fall into the latter category of being health-affirming as it seeks to improve health rather than early detection of an illness. Research summarizing the main effect of message framing has produced mixed results. While overall the findings suggest gain-framed messages are more effective than loss-framed messages, they have small effect sizes (Latimer et al., 2007). But, given how difficult these behaviors can be to change, small effect sizes can influence a lot of people in a mass communication health advertising campaign. A final meta-analysis found that there was a small but statistically significant effect of gain-framed messages on prevention behaviors (O'Keefe & Jensen, 2007). This was largely due to the sample containing studies to do with dental issue preventative behaviors, while behaviors such as safer-sex or diet/nutrition behaviors had no difference between gain- and loss-framed messages (O'Keefe & Jensen, 2007). It is important to study gain- and loss-framed messages

because they are essential to any type of health messaging. When crafting a message, there is a choice between emphasizing the benefits and emphasizing the losses associated with activity or inactivity. Therefore, understanding the interplay of these two opposing strategies is necessary to further improve behavioral outcomes.

This type of messaging has been studied in meta-analyses and it has been suggested that these gain-framed messages with health advertising are slightly more effective than loss-framed messages, in particular for skin cancer prevention, quitting smoking and starting exercise (Gallagher & Updegraff, 2012). For certain preventative behaviors (e.g. exercise, wearing sun screen) it has been shown that gain-framed messages produce higher intentions to perform the preventative behavior (Rothman et al., 1993). This could suggest that loss-framed messages, and fear appeals in general, might not be the best method for eliciting changes in attitude, behavioral intention and actual behavior (Gallagher & Updegraff, 2012). A possible explanation for this is that when messages are gain-framed, people tend to prefer prevention behaviors because of the benefits they offer (Rothman et al., 1993). This is a type of congruity between the gains of the message and the benefits of the behavioral outcome, rather than the consequences a message talks about in loss-frames.

This can be a tricky issue to disentangle. In general, there is no difference between attitude and intention ratings by participants in either gain- or loss-frames, however when it comes to actual behaviors there is a significant effect of gain-framed messages on illness prevention behaviors, particularly with physical activity campaigns (Gallagher & Updegraff, 2012). This effect was not found with loss-framed messages in any of the categories examined and meta-analysis concluded that “in no case was there a

significant loss-frame advantage within any specific domain of prevention behavior” (Gallagher & Updergraff, 2012, p. 111). This finding was consistent other meta-analyses that hypothesized when gain-framed messages emphasize the benefits, this convinces people that they should engage in behaviors which are characterized by low levels of risk or uncertainty, such as using dental floss (Latimer et al., 2007). Although the main effect of message framing seems to be small, there is some evidence that when message framing is combined with other variables, it is significantly more effective (Roberto, Goodall, West & Mahan, 2010; Wirtz & Zimbres, 2015). This is a topic I will return to in the upcoming sections.

2.3 REFERENCE-LEVEL

Reference-level can be defined as processing information by relating it to the self or another person (Burnkrant & Unnava, 1995). Researchers have found that self- versus other-referencing messages influence the ways that people process fear and guilt appeals (Block, 2005). People have been shown to use defense mechanisms when they feel a message could blemish their ego (Keller & Block, 1999). This type of “motivated-reasoning” can lead to the importance of using a self- versus other-referencing message. For example, different types of appeals cause people to have greater or lower evaluations of target outcome variables when paired with a self- versus other-referencing message. When messages use fear appeals, using other-referencing is more effective than self-referencing (Block, 2005). However for guilt appeals, self-referencing appeals are more persuasive (Block, 2005). While in general, self-referencing messages in advertising seem to produce more positive attitude evaluations, this work was done using products in

advertisements and not behaviors like in health communications (Burnkrant & Unnava, 1989).

Work on the self suggests that the concept of the active-self account which can be seen effecting behavior temporarily by altering the active self-concept either through messaging or priming (Wheeler, DeMarree & Petty, 2007). The active self is the conception one has of themselves in a given moment (Wheeler et al., 2007). The active self-concept can account for differences in self- and other-referencing due to the way certain messages bring about a defense mechanism. When the active self is attacked through messaging that goes counter to a person's behavior, they might try to not process the information as a way to avoid the negative feelings associated with being told they are doing the wrong thing. On the other hand, when a message presents consequences and is about another person, this defense mechanism is not as strong since the self is not being attacked.

It is possible that self-referencing could actually be detrimental compared to an other-referencing messages depending on the type of appeal used. Health communications tend to use fear appeals such as in Block's (2005) work and thus it is important to explore this self- versus other-referencing message with gain- and loss-framed messages to see if there are differences. A self-referencing message would be something that references the self such as "If you do this, you will gain weight" versus an other-referencing message such as "If someone does this, they will gain weight." This is useful as a manipulation because in previous research about self- and other-referencing messages for advertising, much of it was concerned with purchase intention and not behavioral intentions.

Although the main effects of self-referencing have been shown to make messages more persuasive by making them self-relevant, it is possible that the message-frame is important for determining the effects of reference-level (Chang, 2011). This is a topic I will return to in the upcoming sections.

2.4 INTERACTIONS BETWEEN IMAGINATION, MESSAGE FRAMING AND REFERENCE-LEVEL

In the previous sections, I introduced each of the key independent variables examined in the thesis. Researchers rarely test only the main effect of each of these variables; instead, the variables are often combined and tested together. In the upcoming sections, I will review how the variables have been paired, before closing with a discussion about what one could expect when imagination, message framing, and reference-level are combined.

Imagination and message framing. Sometimes, there are no differences when the ease with which messages are imagined as well as the message-framing are manipulated (Berry & Carson, 2010). However, in general there are themes with message-framing and imagination. When people are asked to imagine someone else, in this case a child, findings showed a significant increase in evaluations of certain theory of planned behavior variables and self-efficacy when in a loss-frame (Abhyankar, O'Connor & Lawton, 2008). When imagination versus non-imagination and message framing are manipulated, people rate evaluations higher in gain-framed messages (Trotto & Tracy, 2001). This same pattern has been shown where being asked to imagine gain-frames creates a positive effect on attitude and an increased likelihood of intentions to perform positive behaviors (Kingsbury, Gibbon & Gerrard, 2015). Finally, when people think about short-term or long-term consequences with gain- or loss-framed messages, they

tend to evaluate intentions higher for gain-framed messages for long-term consequences and loss-framed messages for short-term consequences (de Bruijn & Budding, 2016). This is tangentially related to imagination versus non-imagination in that thinking about the future is similar to imagination and thinking about immediate consequences is similar to a factual approach.

These findings suggest that message framing may moderate the effect of imagination on attitude and intention. When imagining gain-frames, there are generally higher evaluations of attitude and intention. When imagining loss-frames, this generally generates less favorable attitudes and lower evaluations of intention.

Imagination and reference-level. Imagination and reference-level are variables that interact given how when someone imagines they are either imaging themselves or someone whenever the imagined event is about a person's experience. When people imagine themselves versus imagining another person when recalling information about a neutral action, imagining the self produces a worse recollection than imagining another person (Lord, 1987). When people are imagining a scenario about the self, it increases the perceived likelihood of that outcome occurring than when imagining the scenario about someone else (Gregory et al., 1982). When people imagine a neutral action from a third-person bird's eye view, this produced higher likelihood of engaging in that behavior (Libby et al., 2007). Due to the nature of the study this finding came from containing a neutral action, it is primarily about an interaction between imagination and reference-level. This researcher that found this did not shift the focus of the self or another person, but rather the view of the self. It is included here as there is not much research on these two variables combined, but this gives insight to some part of the equation.

These findings suggest that reference-level may moderate the effects of imagination on attitude and intention. Referencing the self makes events seem more likely. Asking people to imagine things happening to them could influence their attitudes if they have a perception of something being an inevitability or being more likely to occur. If people imagine things happening to others, they might not see it happening to them as an inevitability and could learn from the other person's actions.

Message framing and reference-level. Message framing and reference-level can interact and generally make people have more favorable attitudes and better recall to messages that are self-referencing. When people are directly spoken to by a message, they feel that they have more personal responsibility (Bandura, 1991). When message strength is manipulated, people tend to still have more favorable attitudes with self-referencing messages (Burnkrant & Unnava, 1989). When physicians were sent letters that were either personal (self-referencing) or impersonal (other-referencing), they believed their patients were more susceptible to negative consequences for the kidneys when getting a self-referencing letter (Roberto et al., 2010). In contrast, when Hispanic adults were exposed to manipulations of message framing, reference-level and narrative versus non-narrative, loss-framed self-referencing messages were the most effective in increasing evaluations of intention (Wirtz & Zimbres, 2015).

These findings suggest that reference-level may moderate the effects of message framing on attitude and intention. Self-referencing seems to lead to the highest evaluations of intention and most favorable attitudes with positive messages. It is possible this is due to considering good things happening to oneself is more appealing than good things happening to someone else.

Imagination, message framing and reference-level. Although there are no studies that test the same variables, based on what previous researchers have found I would expect the following. When messages ask people to imagine, gain-framed self-referencing and loss-framed other-referencing messages will produce the most favorable attitudes and highest evaluations of intention. This could be because when messages are self-relevant and about good things, people will feel good about the future. When messages are about bad things, people will feel better thinking about them when it is happening to someone else and not themselves. While these findings are expected, it is also expected that gain-frame other-referencing and loss-frame self-referencing will have the lowest ratings. This is because messages that emphasize benefits about someone else do not make people feel good about their own future. They could make people feel as though they are missing out on those benefits when the message is loss-framed and about the receiver. Messages that ask people to imagine themselves in a loss-frame will have a similar effect where they are now thinking about those bad things happening to themselves; instead of learning from the mistakes of another person suffering those consequences.

For people who are not asked to imagine, it is anticipated that self-referencing messages will be more effective regardless of message framing. When not asking people to imagine the future, but instead asking them to consider something as a possible outcome, they are not thinking about the event actually happening to them. They are thinking about the event as a possibility and not an inevitability. When considering an outcome, it is not being thought of as having already occurred. There are generally small effects from gain-framed messages, but in this experiment a particular message frame is

not predicted to be more or less effective (Gallagher & Updergraff, 2012). Rather, self-referencing messages are expected to be more effective than other-referencing messages regardless of message framing. This is due to the message being self-relevant and causing people to think about what could happen in their future. This is fundamentally different than imagining which presents the outcome as an inevitability rather than a possibility.

Other than a priori logic from previous research, there are also theoretical reasons why these results would be found. I will now reiterate the predicted results with reasoning from theory and previous literature. With the manipulation of imagination and non-imagination, it is anticipated that there will be differences in the interactions between message framing and reference-level, moderated by the use of imagination. In imagination conditions, it is anticipated that gain- and loss-frame messages will interact with reference-level. This interaction will change the outcomes for attitude toward the behavior, subjective norm, perceived behavioral control, intention to perform the behavior and self-efficacy. The directions predicted are that in imagination conditions, gain-framed self-referencing messages and loss-frame other-referencing messages, will produce the highest evaluations of these variables. The lowest evaluations of these variables will be from the gain-frame other-referencing and loss-frame self-referencing conditions. The reason for this hypothesis is that when people are operating in gain-frames, they are risk-averse and thus referencing the self makes messages more relevant to the reader to enjoy beneficial outcomes rather than when imagining the benefits for someone else (Rothman & Salovey, 1997). When operating in a loss-frame, it is anticipated that referencing others will produce higher evaluations because the risk seeking behavior is put onto another person's future that the viewer can learn from

compared to imagining themselves suffering these consequences (Rothman & Salovey, 1997). This is a type of congruity between the risk-aversion and risk-seeking behavior matching what is desirable for the self or learning from someone else.

Conversely in non-imagination conditions, it is anticipated that self-referencing will produce a main effect leading to more favorable attitude toward the behavior, higher ratings of perceived behavioral control, higher ratings of intention to perform the behavior as well as higher ratings of self-efficacy. This would coincide with previous findings that self-referencing will produce higher evaluations regardless of message-frame (Chang, 2011). The effects of risk aversion and risk seeking will not move in the same direction for non-imagination because the reader is considering the outcomes as possibilities and evaluating for themselves (Rothman & Salovey, 1997). This is different than imagining because imagination causes the formation of memories (Levine et al., 1998). Self-perception theory shows that attitude formation can come from remembering previous actions (Bem, 1973). Thus by not creating a memory through imagination, the events can be considered as outcomes instead of being thought of as inevitabilities leading to formations of attitudes when sorting through memories.

2.5 HYPOTHESES

Imagination conditions

H1: Participants who are told to imagine the future and are exposed to gain-framed messages that reference the self will have significantly more positive responses to the message than participants who are exposed to gain-framed messages that reference others. As such, they will report:

H1a: more positive attitudes toward exercise

H1b: stronger subjective norms supporting exercise

H1c: higher perceived behavioral control

H1d: stronger feelings of self-efficacy

H1e: higher intention to perform exercise

H2: Participants who are told to imagine the future and are exposed to loss-framed messages that reference others will have significantly more positive responses to the message than participants who are exposed to loss-framed messages that reference the self. As such, they will report:

H1a: more positive attitudes toward exercise

H1b: stronger subjective norms supporting exercise

H1c: higher perceived behavioral control

H1d: stronger feelings of self-efficacy

H1e: higher intention to perform exercise

Non-imagination conditions

H3: Participants who are told to consider the outcomes as a possibility and are exposed to loss-framed messages that reference the self will have significantly more positive responses to the message than participants who are exposed to loss-framed messages that reference others. As such, they will report:

H1a: more positive attitudes toward exercise

H1b: stronger subjective norms supporting exercise

H1c: higher perceived behavioral control

H1d: stronger feelings of self-efficacy

H1e: higher intention to perform exercise

H4: Participants who are told to consider the outcomes as a possibility and are exposed to gain-framed messages that reference the self will have significantly more positive responses to the message than participants whoa are exposed to gain-framed messages that reference others. As such, they will report:

H1a: more positive attitudes toward exercise

H1b: stronger subjective norms supporting exercise

H1c: higher perceived behavioral control

H1d: stronger feelings of self-efficacy

H1e: higher intention to perform exercise

2.6 OUTCOME VARIABLES

The outcome variables for this thesis are from the theory of planned behavior (Ajzen, 1991). These variables were chosen because they have been shown to be accurate predictors of actual behaviors (Ajzen, 1985; Gollwitzer, 1999; Gallagher & Updergraff, 2012). The theory of planned behavior posits several variables that predict behaviors. These four variables are attitude toward the behavior, subjective norm, perceived behavioral control and intention to perform the behavior (Ajzen, 1991).

2.6.1 ATTITUDE

The theory recognizes that general dispositions have not been good predictors of behavior in a single scenario, TPB suggests looking at behaviors in the aggregate to reduce other factors that influence individual decisions (Ajzen, 1991). Due to this view of using aggregation, using the attitude toward a behavior can be a predictor of broad behaviors to come but not a single behavior. This is contingent upon the other independent variables that Ajzen (1991) espouses to be important.

2.6.2 SUBJECTIVE NORM

The next is the subjective norm of the behavior. The subjective norm “refers to the perceived social pressure to perform or not perform the behavior” (Azjen, 1991, p. 188). For health behaviors, this could be social pressure to exercise or social pressure to not smoke cigarettes. The theory suggests that it is important for people to feel that the behaviors they wish to engage in are socially accepted. Due to this, “the more favorable the attitude and subjective norm with respect to a behavior, and the greater the perceived behavioral control, the stronger should be an individual’s intention to perform the behavior” (Azjen, 1991, p.188). This needs to be measured because social pressures or social acceptability can influence if someone performs or does not perform a behavior (Azjen, 1991). Even with a positive attitude towards a behavior, someone might not engage in it because they feel social pressure not to.

2.6.3 PERCEIVED BEHAVIORAL CONTROL

The variables of attitude toward the behavior and social norm are related to perceived behavioral control. Perceived behavioral control is a reference to the relative ease or difficulty that someone perceives towards performing a specific behavior (Azjen, 1991). This is important to measure because different types of messages can influence the difficulty with which performing a given behavior has as perceived by a viewer. If a message makes an action seem very difficult, this can influence their intention to perform that behavior.

2.6.4 BEHAVIORAL INTENTION

Finally, these three variables (attitude, subjective norm and perceived behavioral control) lead to the intention to perform a behavior, which is an indicator of actual

behaviors in the aggregate (Ajzen, 1991). This is to say that when someone has a positive attitude towards a behavior, they feel that their social sphere would approve of the behavior and they perceive it as something relatively easy for them to do, they will intend to perform the behavior. This results in an aggregate of people performing that specific behavior. This measure is necessary to assess the degree to which someone believes they will exercise or perform a behavior. Influencing this is an important part of predicting behaviors especially given that while attitude and intention are often rated similarly, loss-framed messages typically do not produce as strong of changes in actual behaviors (Gallagher & Updergraff, 2012).

2.6.5 SELF-EFFICACY

Self-efficacy was also included as an outcome variable. While the theory of planned behavior contains perceived behavioral control, it does not contain the variable of self-efficacy. These variables are very similar, in that perceived behavioral control is the ease with which a person believes an action can be done, while self-efficacy “is concerned with people’s beliefs in their capabilities to produce given attainments” (Bandura, 2006, p. 307). This is distinctly different from TPB’s perceived behavioral control. Perceived behavioral control refers to the ease or difficulty that is perceived with performing the behavior (Ajzen, 1991). However, self-efficacy is concerned with the belief in someone’s capability to do this behavior (Bandura, 2006). For example, with healthy eating, people may perceive ordering a healthy option as easy, but they do not believe they have the self-efficacy to resist the temptations of ordering something unhealthy. Due to this, it is possible that a way to better mix attitude, social norms, and perceived behavioral control to influence intentions and predict behavior, self-efficacy is

a missing variable that can influence those intentions. Others have touched on the importance of self-efficacy and argued that it should be incorporated when measuring perceived behavioral control (Ajzen, 2002). It has been suggested that for certain purposes, measures of self-efficacy and perceived behavioral control can be combined (Ajzen, 2002). However, as mentioned previously, there is a distinction between one's belief in themselves and their perception of the difficulty for performing a behavior.

It is important to add in additional variables like this because the “one measure fits all” approach usually has limited explanatory and predictive value” due to most of the items having little to no relevance with what is being measured (Bandura, 2006, p. 307). This can happen when multiple scales are condensed into a single measure as it removes some of the nuances of what people are feeling and how it can predict their behavior. The importance of efficacy has been touched on by some research for health campaign advertisements (Witte & Allen, 2000). In a meta-analysis of fear appeals in advertising messages, those which had a high-efficacy message were most effective in prevention behaviors (Witte & Allen, 2000). While it is the case that as fear appeals strengthen, the persuasiveness of the message also increases (Witte & Allen, 2000, p. 601). However, the strongest effects came from messages with a focus on self-efficacy (Witte & Allen, 2000). Self-efficacy messages “determines whether people will become motivated to control the danger of the threat or control their fear about the threat” (Witte & Allen, 2000, p. 594). This suggests that while the more fear that a message arouses, the more it is persuasive, but this is not to say that it will then influence behavioral intentions without pro-self-efficacy messages to moderate this relationship (Witte & Allen, 2000). Messages that focus on efficacy are in stark contrast to simple fear appeals. A simple fear appeal

inherently brings about a mood with a negative valence and high arousal (Witte & Allen, 2000). Due to this, it is important to measure self-efficacy perceptions by viewers.

2.7 EXERCISE

The target behavior for the thesis was exercise. I chose this behavior because one of the best ways to increase one's health is by engaging in physical activity. Exercise can be defined as “planned, structured, repetitive, and purposive” physical bodily movements (Caspersen, Powell & Christenson, 1985, p. 128). It is often done with the intention to “burn” calories and maintain physical fitness (Caspersen et al., 1985). It is important that messages aimed at combatting health issues be properly formulated with America's national obesity rates further increasing over time (Flegal, Carroll, Kit, Ogden, 2012). It is worth studying this to curb obesity and improve the quality of life for Americans. If money is spent properly on improving behaviors of Americans to be more healthy, then hopefully the projected increase in ad spending for pharmaceuticals and healthcare will not need to take place as the nation becomes healthier.

CHAPTER 3: METHODOLOGY

3.1 DESIGN

The study used a 2 (imagination: imagination, non-imagination) x 2 (message-frame: gain, loss) x 2 (reference-level: self, other) between-subjects, post-test-only factorial experimental design.

3.1.1 DEFINITIONS OF VARIABLES

Imagination can be defined conceptually as a person's capacity to construct a mental representation of an abstract object (Beres, 1960). Imagination was operationalized by requesting that the participant visualize the outcomes presented. Conversely, non-imagination was operationalized by asking participants to consider the outcomes as a possibility. For example, in the imagination conditions, messages started with phrases like "take a moment to visualize" or "imagine" while those in the non-imagination conditions read phrases like "research has shown" or "consider."

Message framing is conceptually defined as an induced shift in the positivity or negativity of outcomes (Treadwell & Lenert, 1999). Message framing was operationalized with messages that emphasized the potential benefits (gain-framed) or potential consequences (loss-framed) of engaging in or abstaining from exercise. Gain-framed wording would be "visualize yourself and all the good things that can come from your regular exercise" while loss-framed wording would be "visualize yourself and all the bad things that can happen if you fail to exercise regularly" (See Appendix A). Those in the gain-framed conditions read messages that discussed the positive outcomes of engaging in physical activity while those in the loss-framed conditions read messages about the potential consequences of abstaining from exercise.

Finally, reference-level can be conceptually defined as processing of information by relating it to the self or another person (Burnkrant & Unnava, 1995). It was operationalized using second- or third-person wording. This means that messages that were self-referencing, contained words like “you” while other-referencing messages contained words like “someone” or referenced people in general.

3.2 PARTICIPANTS

A convenience sample of 275 American adults from various geographic locations were recruited to the study using Amazon Mechanical Turk (MTurk). MTurk is a website where people can sign-up to do various short tasks such as participating in an experiment or transcribing text from images in exchange for small sums of money. In this case, MTurk has some differences from the overall population it is meant to generalize to, however it is more representative and diverse than a college subject pool by age, gender and other factors (Paolacci, Chandler & Ipeirotis, 2010). Additionally, participants from MTurk tend to be more socioeconomically and ethnically diverse than subject pools (Casler, Bickel & Hackett, 2013; Goodman, Cryder & Cheema, 2013). Participants were compensated \$0.30 for their participation in this study.

An a priori power analysis using G*Power 3.1 (Faul, Erdfelder, Buchner & Lang, 2009) to use an *F*-test family and analysis of variance to measure interactions with eight groups with one numerator degree of freedom, the minimum number of participants for 95% power and an effect size of 0.25, is 210. The final experiment contained 275 participants. The effect size of 0.25 for an *F*-Test was chosen because this is a medium effect size which should be enough to test if an effect exists in this exploratory experiment (Cohen, 1992). Effect sizes from the pre-test were not available to estimate an

appropriate effect size for the full-experiment because the pre-tests were within-subjects while the full-experiment was between. I will explain the pre-test methodology in the next section.

3.3 MESSAGE PRETESTING

Pre-testing of message framing took place over several weeks to ensure that the messages were long enough to engage readers and have a meaningful impact on dependent measures. The goal of pre-testing was to ensure that the gain- and loss-framed messages emphasized the potential benefits or consequences of engaging in or abstaining from exercise.

An example of the questions used to assess message framing were “Overall, the message focused on the risks of not exercising” with seven-point Likert-type scales containing options to strongly agree or disagree. At the end, an open-ended response question was used to assure that messages were easy to understand and clear. These open-ended responses provided feedback about the messages and helped to make them sound more natural in certain conditions.

The first pre-test was a within-subjects design with 40 participants from MTurk. The results of the first pre-test with the shortest version of the stimuli produced almost no difference between the loss-frame messages ($M=3.39$, $SD=2.81$) and gain-frame messages ($M=4.12$, $SD=1.79$), $t(67.91) = 1.41$, $p > .05$, $d = 0.32$. In addition to this, messages that referenced the self ($M=2.63$, $SD=1.18$) were rated as addressing the reader more than other-referencing messages ($M=3.22$, $SD=1.77$), however the difference was not significant, $t(58.76) = 1.69$, $p > .05$, $d = 0.40$. The imagination variable was measured in the non-imagination conditions ($M=2.15$, $SD=1.23$) and did not differ significantly

from the imagination conditions ($M=2.13$, $SD=1.26$), $t(77.94) = 0.09$, $p > .05$, $d = 0.02$. Finally, the open-ended portion allowed participants to describe typographical errors in one condition. Other participants open-ended responses indicated that the other seven conditions were clear and easy to understand.

After this pre-test, the stimuli were reworked several times. After a series of pre-tests lengthening and expanding the message to be more vivid in both the loss- and gain-frames, there was an observed significant difference suggesting the manipulation was being picked up. The final pre-test was within-subjects and contained 40 participants from Mturk. The results of the final pre-test showed that gain-frame messages ($M=5.98$, $SD=1.71$) were rated significantly higher for emphasizing positive outcomes than loss-frame messages ($M=3.43$, $SD=1.35$), $t(74.03) = 7.41$, $p < .0001$, $d = 1.66$. Next, the pre-test for reference-level showed that participants rated their agreement of if the message was talking about them, self-referencing ($M=1.66$, $SD=1.02$), significantly higher agreement (lower numbers mean higher agreement) than the other-referencing conditions ($M=4.90$, $SD=2.02$), $t(55.36) = 8.98$, $p < .0001$, $d = 2.01$. Lastly, the open-ended responses contained no references to typographical errors or unclear statements used in the stimuli. Some participants in the open-ended section were thankful to have gotten a reminder about the importance of physical activity. With the pre-test confirming that the messages were understood and the manipulations of message framing and reference-level were being picked up by participants, the full study was ready to be conducted.

The final stimulus material contained an average of 195 ($SD=6.39$) words per condition. The shortest condition was the non-imagination gain-frame other-referencing condition with 186 words, while the longest condition was the imagination loss-frame

self-referencing condition with 205 words. This made the difference in length between the shortest and longest message about 10%. The pretests resulted in eight versions of the stimuli, all of which can be found in Appendix A.

3.4 PROCEDURE

After participants gave informed consent to the study, they were randomly presented with one of the eight messages on a Qualtrics survey page. A timer was set up to prevent participants from moving forward for 60 seconds in order to increase the likelihood that they read the message fully. After this 60-second period, participants were allowed to move on to the questionnaire. The questionnaire was presented in a randomized order and contained measures of attitude towards the behavior of physical activity, perceived behavioral control, subjective norm, intention to perform the behavior, and self-efficacy. Next, participants were asked questions about their exercise habits and finally there was also an open-ended portion for participants to give their thoughts. After completion, participants were debriefed and given a completion code for MTurk. Data were collected in approximately 60 hours across three days from January 28, 2017 at 10:40 a.m. to January 30, 2017 at 10:40 p.m. The full questionnaire can be found in Appendix B.

3.5 MEASURES

The questionnaire was designed based on an outline provided by Azjen (2006) titled “Constructing a theory of planned behavior questionnaire.” Each scale used to measure the dependent variables was constructed using seven-points Likert-type scales with item-specific response options (Saris, Revilla, Krosnick & Shaeffer, 2010). Item-specific response options use the same wording in the response options as the question.

This is similar to adapting previous scales but done in a systematic way to increase accuracy and reliability. For example, the item for intention to perform a behavior stated “The likelihood that I would or will exercise for at least 30 minutes, three or more times per week or the next three months is” was followed by response options “Extremely unlikely, moderately unlikely, slightly unlikely, neither likely nor unlikely, slightly likely, moderately likely or extremely likely” rather than asking participants to rate how much they agree with a statement about their future exercise habits. The full questionnaire can be found in Appendix B.

Each dependent variable had three measures. For all sets of three measures, internal consistency was acceptable at $\alpha > 0.75$ with measures for attitude towards the behavior (Cronbach $\alpha = 0.92$), perceived behavioral control (Cronbach $\alpha = 0.82$), subjective norm (Cronbach $\alpha = 0.78$), intention to perform the behavior (Cronbach $\alpha = .88$), and self-efficacy (Cronbach $\alpha = 0.78$). With internal consistency above the acceptable minimum threshold, the three measures were averaged to create index measures for the dependent variables.

CHAPTER 4: RESULTS

4.1 MANIPULATION CHECK

The manipulation of message framing was pre-tested and also a manipulation check was utilized in the full experiment. In the full experiment, participants rated the positivity of the gain-frame conditions ($M=6.27$, $SD=1.96$) significantly higher than the loss-frame conditions ($M=3.35$, $SD=1.20$), $t(200)=10$, $p < 0.0001$, $d = 1.78$. These results were similar to the final pre-test and even produced a greater difference with both means moving further in the desired directions¹.

4.2 DESCRIPTIVE STATISTICS

Before conducting inferential statistics, descriptive statistics for the outcome variables were generated. Histograms were used to visually inspect the data for normal distribution. All outcome variables were approximately normally distributed with acceptable kurtosis and skewness levels. Tables showing these values along all means and correlations can be found in Appendix C: Table 1, Table 2, Table 3 and Table 4. One thing to note while reading the inferential analyses is that many conditions compared contained unequal variances. The unequal variances resulted in using a Welch two-sample t -test for the simple effects analyses. The use of this test resulted in degrees of freedom being reported lower than expected and some contain decimal values.

4.3 ATTITUDE

A three-way analysis of variance (ANOVA) with imagination, message framing and reference-level as the independent variables and attitude as the dependent variable was conducted. None of the main effects were significant (all $p > .05$). Next, none of the two-way interactions were significant (all $p > .05$). However, there was a significant

three-way interaction between imagination, message framing and reference-level, $F(1, 267) = 7.12$, $p < .01$, $\eta_p^2 = .03$.

For the imagination conditions, gain-framed self-referencing messages and loss-framed other-referencing messages were about the same and the most positive attitude. In the non-imagination conditions, the gain-framed self-referencing messages and loss-frame self-referencing messages produced the most positive attitude. All means can be found in Appendix C: Table 2 and Table 3.

Because the three-way interaction was significant, simple effects tests were conducted to test the hypotheses. A simple effects test was conducted for the imagination conditions with a gain-framed message. A comparison of the gain-framed self-referencing ($M=5.31$, $SD=1.55$) messages with gain-framed other-referencing ($M=4.27$, $SD=1.92$) messages showed that they were significantly different, $t(59.66) = 2.40$, $p < .01$, $d = 0.60$. This result supports H1a. See Appendix C: Table 2 and Figure 3.

A simple effects test was also conducted for the imagination conditions with a loss-framed message. A comparison of loss-framed other-referencing ($M=5.28$, $SD=1.41$) messages with loss-framed self-referencing ($M=4.82$, $SD=2.00$) messages showed that they were not significantly different, $t(59.51) = 1.09$, $p > .05$, $d = 0.26$. This result does not support H2a. While the differences were not significant, the means differed in the predicted directions. See Appendix C: Table 2 and Figure 3.

A simple effects test was conducted for the non-imagination conditions with a loss-framed message. A comparison of loss-framed self-referencing ($M=5.48$, $SD=1.47$) messages with loss-framed other-referencing ($M=5.08$, $SD=1.54$) messages showed that they were not significantly different, $t(70) = 1.00$, $p = .10$, $d = 0.27$. Although the means

differed in the predicted directions, this result does not support H3a. See Appendix C: Table 3 and Figure 4.

Finally, a simple effects test was conducted for the non-imagination conditions with a gain-framed message. A comparison of gain-framed self-referencing ($M=5.13$, $SD=1.75$) messages with gain-framed other-referencing ($M=4.91$, $SD=1.48$) messages showed that they were not significantly different, $t(70) = 0.60$, $p > .05$, $d = 0.14$. Although the means differed in the predicted directions, this result does not support H4a. See Appendix C: Table 3 and Figure 4.

4.4 SUBJECTIVE NORM

A three-way ANOVA with imagination, message framing and reference-level as the independent variables and subjective norm as the dependent variable was conducted. None of the main effects were significant (all $p > .05$). Next, none of the two-way interactions were significant (all $p > .05$). Finally, there was no three-way interaction ($p > .05$). There was no distinct pattern to describe the means for subjective norm. All means and effects can be found in Appendix C: Table 2, Table 3, Figure 5 and Figure 6. These results do not support H1b, H2b, H3b or H4b.

4.5 PERCEIVED BEHAVIORAL CONTROL

A three-way ANOVA with imagination, message framing and reference-level as the independent variables and perceived behavioral control as the dependent variable was conducted. There was one significant main-effect for message framing, $F(1, 267) = 8.39$, $p = 0.05$, $\eta_p^2 = .014$. There were no significant two-way interactions (all $p > .05$). Finally, there was a significant three-way interaction with imagination, message framing and reference-level, $F(1, 267) = 15.80$, $p < .01$, $\eta_p^2 = .026$.

For the imagination conditions, gain-framed self-referencing messages and loss-framed other-referencing messages were about the same and the highest evaluations of perceived behavioral control. In the non-imagination conditions, the gain-framed self-referencing messages and loss-frame self-referencing messages produced the highest evaluations of perceived behavioral control. All means and effects can be found in Appendix C: Table 2 and Table 3.

A simple effects test was conducted for message framing for the loss-framed ($M=4.16$, $SD=1.51$) compared to the gain-framed ($M=3.82$, $SD=1.52$) conditions. The differences were significantly different, $t(272.38) = 2.00$, $p = .05$, $d = 0.23$. This result suggests that loss-framed conditions produced higher evaluations of perceived behavioral control than gain-framed conditions.

Because the three-way interaction was significant, simple effects tests were conducted to test the hypotheses. A simple effects test was conducted for the imagination conditions with a gain-framed message. A comparison of gain-framed self-referencing ($M=4.35$, $SD=1.70$) messages with gain-framed other-referencing ($M=3.51$, $SD=1.59$) messages showed that they were significantly different, $t(64.96) = 2.09$, $p < .05$, $d = 0.51$. This result supports H1c. See Appendix C: Table 2 and Figure 7.

A simple effects test was conducted for the imagination conditions with a loss-framed message. A comparison of loss-framed other-referencing ($M=4.38$, $SD=1.27$) messages with loss-framed self-referencing ($M=3.78$, $SD=1.61$) messages showed that they were significantly different, $t(62.37) = 1.69$, $p < .05$, $d = 0.41$. This result supports H2c. See Appendix C: Table 2 and Figure 7.

A simple effects test was conducted for the non-imagination conditions with a loss-framed message. A comparison of loss-framed self-referencing ($M=4.37$, $SD=1.55$) messages compared to loss-framed other-referencing ($M=4.12$, $SD=1.53$) messages showed that they were not significant, $t(70) = 0.70$, $p > .05$, $d = 0.16$. Although the differences were not significantly different, the means differed in the predicted directions. This result does not support H3c. See Appendix C: Table 2 and Figure 8.

Finally, a simple effects test was conducted in the non-imagination conditions with a gain-framed message. A comparison of gain-framed self-referencing ($M=3.79$, $SD=1.45$) messages with gain-framed other-referencing ($M=3.57$, $SD=1.21$) messages showed that they were not significantly different, $t(70) = 0.70$, $p > .05$, $d = 0.17$. Although the difference was not significant, the means differed in the predicted directions. This result does not support H4c. See Appendix C: Table 2 and Figure 8.

4.6 SELF-EFFICACY

A three-way ANOVA with imagination, message framing and reference-level as the independent variables and self-efficacy as the dependent variable was conducted. There was one main-effect of message framing, $F(1, 267) = 9.34$, $p < .05$, $\eta_p^2 = .02$. Next, there were no significant two-way interactions (all $p > .05$). Finally, there was a significant three-way interaction with imagination, message framing and reference level, $F(1, 267) = 7.82$, $p < .05$, $\eta_p^2 = .02$. All means and effects can be found in Appendix C: Table 2 and Table 3.

A simple effects test was conducted for message framing in the loss-framed ($M=5.78$, $SD=1.30$) compared to the gain-framed ($M=5.41$, $SD=1.51$) conditions. The differences were significantly different, $t(300) = 2.00$, $p < .05$, $d = 0.26$. This suggests

that loss-framed messages produced higher evaluations of self-efficacy than did gain-framed conditions.

Because the three-way interaction was significant, simple effects tests were conducted to test the hypotheses. A simple effects test was conducted for the imagination conditions with a gain-framed message. A comparison of gain-framed and self-referencing ($M=5.80$, $SD=1.37$) messages with gain-framed other-referencing ($M=4.89$, $SD=1.74$) messages showed that they were significantly different, $t(60) = 2.37$, $p < .05$, $d = 0.59$. This result supports H1d. See Appendix C: Table 2 and Figure 9.

A simple effects test was conducted for the imagination conditions with a loss-framed message. A comparison of loss-framed other-referencing ($M=5.68$, $SD=1.36$) messages with loss-framed self-referencing ($M=5.56$, $SD=1.49$) messages showed that they were not significantly different, $t(61.07) = 1.15$, $p > .05$, $d = 0.28$. Although the means differed in the predicted directions, the difference was not significant. This result does not support H2d. See Appendix C: Table 2 and Figure 9.

A simple effects test was conducted for the non-imagination conditions with a loss-framed message. A comparison of loss-framed self-referencing ($M=5.95$, $SD=1.21$) messages with loss-framed other-referencing ($M=5.68$, $SD=1.36$) messages showed they were not significantly different, $t(70.42) = 0.90$, $p > .05$, $d = 0.21$. While the means differed in the predicted directions, this result does not support H3d. See Appendix C: Table 3 and Figure 10.

Finally, a simple effects test was conducted for the non-imagination conditions with a gain-framed message. A comparison of gain-framed self-referencing ($M=5.36$, $SD=1.52$) messages with gain-framed other-referencing ($M=5.57$, $SD=1.30$) messages

showed that they were not significantly different, $t(65.42) = 0.60, p > .05, d = 0.14$. This result does not support H4d. See Appendix C: Table 3 and Figure 10.

4.7 INTENTION

A three-way ANOVA with imagination, message framing and reference-level as the independent variables and intention as the dependent variable was conducted. None of the main-effects were significant (all $p > .05$). Next, none of the two-way interactions were significant (all $p > .05$). Finally, there was no significant three-way interaction ($p = .06$). There was no distinct pattern to describe the means for intention. All means and effects can be found in Appendix C: Table 2, Table 3, Figure 11 and Figure 12. These results do not support H1e, H2e, H3e or H4e.

¹ There was no manipulation check for reference level or imagination in the full experiment. For imagination, it was believed that participants could not distinguish the degree to which they did or did not imagine something. Based on similar conclusions as O’Keefe (2003), who argues that certain differences between stimuli are not distinguishable for participants. This is to say that if two versions of stimuli are opposites, in this case one uses second-person and one uses third-person, then the perception of the participant does not change how the message is written. Additionally, the imagination manipulations were made in a similar way. The messages clearly stated to either consider as a fact, or to imagine the outcomes presented. These two manipulations were induced by changes that the participant might not be able to distinguish and thus, should not require a manipulation check. A participant’s perception of certain manipulations is not an accurate reflection of if there is a difference between the stimuli.

CHAPTER 5: DISCUSSION

5.1 GENERAL DISCUSSION

The goal of the study was to test the effect of imagination in health messages promoting regular exercise behavior. In addition to having some participants imagine or not imagine the future, the study also tested whether message framing and reference-level would have a significant effect on the outcome variables. Message framing was manipulated through the messages emphasizing benefits of exercise or consequences from inactivity and lack of exercise. Reference-level was manipulated by using pronouns that referred directly to the participant (self-referencing) or by using wording that referred to people in general (other-referencing).

Effect of imagination. In the imagination conditions, gain-framed messages were more effective when they used direct references to the person receiving the message (e.g., you, your) when compared to messages that referenced people in general (e.g., people, someone) In the loss-framed conditions, the opposite was found. Messages that referenced people in general were more effective than messages that referenced the person receiving the message. In the imagination conditions, reference-level moderates the effects of message framing. Generally, this was found for attitude, perceived behavioral control and self-efficacy. However, it was not found for subjective norm or intention. The issues with these measures are discussed in the limitations. The important part of these findings is that when gain-framed messages reference the self, they are about the same in imagination or non-imagination conditions. However, when it comes to loss-framed messages, other-referencing messages were more effective than self-referencing messages for imagination conditions. These findings conform to previous

studies that also showed that self-referencing was best for gain-framed messages when people were asked to imagine (Kingsbury et al., 2015; Trotto & Tracy, 2001). Finally, these results also conformed to a study that showed that when imagining loss-framed messages, referencing others influenced more positive attitudes (Abhyankar et al., 2008).

This pattern suggests that when imagination is evoked, it is best to reference the self for gain-framed messages and to reference others when using a loss-framed message. A potential explanation for this is that when imagining the future, it is not being considered as a potential outcome, and instead being seen as an inevitability. The reason for this is that when imagining, the same cognitive processes are used as in memory (Levine et al., 1998). When imagining, people create new memories and these memories happen to be about the future. This might not be something we can distinguish when evaluating our attitudes towards an object or action. As shown by self-perception theory, previous behaviors can influence attitudes (Bem, 1972). Suggesting that memories, even when about the future, could influence our attitudes since the memories are about behavior. Finally, similar research has shown that people perceived a higher likelihood of an event occurring when they imagine it about themselves than when they imagine it about someone else (Gregory et al., 1982). The combination of these three previous findings explains why imagining future outcomes produces counter-intuitive results for loss-framed messages and reference-level. The logic behind this is that when someone imagines themselves in the future suffering from the consequences of not exercising, they will perceive that outcome to be more likely. This can lower their perception of the ease with which exercise can be performed as well as their belief in their own ability to exercise. From self-perception theory, when they are considering their attitude toward the

behavior, they have a memory of themselves (in the future) where they did not exercise, so they will evaluate their attitude of exercise less favorably.

Overall, this pattern suggests that when evoking imagination, one must carefully consider the message framing and reference-level. When people are imagining good things, it is best that they imagine it happening to themselves. When people are imagining bad things, it is best that they imagine it happening to others. This way they can think about good things happening for themselves and then learn from mistakes of others.

Effect of not imagining. In the non-imagination conditions it was generally the case that self-referencing messages produced higher evaluations than other-referencing messages. This was not the case for subjective norm or intention to perform behavior. However this is discussed later in the limitations. For attitude, perceived behavioral control and self-efficacy, it was the case that self-referencing messages produced higher evaluations than other-referencing. Loss-framed messages produced higher evaluations regardless of reference-level. These findings of self-referencing producing higher evaluations with loss-frames were consistent with previous research such as Roberto et al. (2010). This also conforms with research by Wirtz and Zimbres (2015) which also found that attitudes were more favorable for loss-framed self-referencing messages. Finally, these results were similar to other studies that showed that people tend to increase their intentions when loss-framed messages are about the short-term and gain-framed messages for long-term consequences (de Bruijn & Budding, 2016).

This pattern suggests that when presenting a factual approach, it is best to emphasize the losses that viewers themselves can suffer. While the least effective approach is to present the gains for someone else. Some reasons for this are that while we

are simply considering the future it is not being presented as inevitable, such as when imagined.

5.2 THEORETICAL IMPLICATIONS

There are several theoretical implications of the results of the study for self-perception theory. One implication is that by explicitly asking someone to imagine themselves in the future it may create a version of their “future self” (Ersner-Hershfield, Garton Ballard, Samanez-Larkin & Knutson, 2009). The theory of future-self continuity posits that congruity between future outcomes and the self results in favorable outcomes (Ersner-Hershfield et al., 2009). However, this study shows that there are differences when imagining the future about the self compared to considering the future about the self. While the memories created during imagination are of a future self, they can still influence attitudes similarly to how past behavior has been shown to influence formation of attitudes in self-perception theory (Bem, 1972). If someone exercises regularly and they are asked about their attitudes towards exercise, they most likely will have a favorable opinion of it because they have a lot of memories of exercise. However, if someone imagined a future version of themselves where they have not exercised, it might not be possible for them to distinguish that the memory is about the future, leading to a lower attitude towards exercise. When imagining the self, it is best to emphasize the benefits one can enjoy because then this will create memories of engaging in that behavior. This will lead to more favorable attitudes by the person thinking about their perceived experiences because their memories will be about performing that behavior.

There are also several theoretical implications for prospect theory with message-framing and reference-level when imagining. When imagining loss-frames, there is a

difference between imagining the self and imagining another person. When imagining others in a loss-frame, positivity of attitudes was found to be higher than when imagining the self. This could be because when one is in a loss-frame, they are risk seeking, and when those risks are for others they can learn from the other person's mistakes (Rothman & Salovey, 1997). It has been posited that gain-frames and loss-frames need to be considered with the context (Rothman & Salovey, 1997). This leads to the suggestion that another context could be the reference level. By taking the risk seeking behavior and putting it onto another person, the memory is not created about the self. Therefore, by imagining another person, a less favorable attitude based on past (or future) experiences does not form. Conversely, imagining others in a gain-frame is similar to imagining losses for the self. When in a gain-frame, people are risk averse. By putting the risk aversion onto someone else, the memory does not form about one's own experience, leading to a less favorable attitude than when imagining gains for the self.

There are several theoretical implications for prospect theory. The findings for imagination are of particular interest. While message framing and reference-level are more well understood, imagination is not generally taken into account in studies utilizing prospect theory. It has been shown in a meta-analysis that gain-framed messages are slightly more effective for skin cancer prevention, quitting smoking and starting exercise (Gallagher & Updergraff, 2012). This does not conform with what was found in the non-imagination conditions studied here. The results did not conform with the imagination conditions either. When imagination is used, there is relatively no difference between gains or losses unless reference-level is taken into account. When one is operating in a gain-frame, they are risk averse. To be thinking about risk aversion, benefits for the self

are likely more impactful than risk aversion for others. When one is operating in a loss-frame they are risk seeking. Seeking risks for others likely produces higher attitudes and evaluations of perceived behavioral control and self-efficacy because they can learn from mistakes of the “other” in the scenario.

There are some implications for the theory of planned behavior in health messaging. In non-imagination conditions, loss-frame self-referencing messages performed better than gain-frame self-referencing. However, this flipped to gain-frame self-referencing being more effective than loss-frame self-referencing when imagination was used. From meta-analyses, it is shown that there are small effect-sizes, yet statistically significantly higher evaluations of gain-framed messages (Latimer et al., 2007). It is possible that the variable of imagination could be influencing these results, and thus the effect sizes could be larger when this variable is taken into account for message framing. However, the previous finding of a significant effect on intention from gain-framed messages was not found in the imagination or non-imagination conditions. This does not conform with previous meta-analyses which found intention to be greater in gain-frames (Gallagher & Updergraff, 2012). However, this could be due to covariance of intention and actual behaviors which is discussed in the limitations.

Focusing on the results of attitude, perceived behavioral control and self-efficacy tells an important story. When looking at the data presented in this study for non-imagination, it is apparent that loss-frame self-referencing messages produce higher evaluations of attitude, perceived behavioral control, and self-efficacy. However, when a well-intentioned attempt is made to strengthen these differences by asking people to imagine, the opposite pattern emerges where loss-frame other-referencing messages are

best when employing imagination. This is counter-intuitive from the non-imagination findings. However, this distinction is important as it can make a big difference when influencing behaviors in mass communication campaigns.

Another implication for those building or testing theory is that the use of imagination produces differences in key variables. It is fairly common for research to ask participants to imagine as a part of the methodology (e.g., Berry & Carson, 2010; Abhyankar et al., 2008; Trotto & Tracy, 2001, Kingsbury et al., 2015) but it is not often compared with non-imagination. This variable of imagination when presenting outcomes seems to have important implications for message framing and reference-level as it moderates the effects. Due to this finding, it is proposed that researchers be careful and purposeful when using imagination as a part of their methodology. This implication is important because it can influence the progress of multiple theories.

5.3 PRACTICAL IMPLICATIONS

The results also have implications for health practitioners. First, when designing messages that directly ask participants to imagine (See Figure 13) or indirectly (e.g., the “Rewind the Future” ad) use imagination, message designers should focus on the benefits of performing the recommended behavior when they use the perspective of the viewer. When they want to emphasize losses, it is recommended to evoke the perspective of another person who is not the message recipient. For example, the “Measure Up” campaign would represent this perspective of another for loss-frames while the “Rewind the Future” ad would reference the viewer directly.

The second implication is that when advertisers are not trying to get the viewer to imagine, it is best to emphasize the consequences the viewer themselves can suffer from.

This produced the highest effects for non-imagination conditions. It is likely when presenting a possible outcome, it is best to emphasize what one can lose out on if they do not engage in healthy behaviors like exercise. This is most likely different than asking to imagine because when asking to imagine, it is a different cognitive process than considering an outcome and making a decision. Practitioners should note that there was not much of a difference between imagination and non-imagination conditions when it came to what was the most effective. Suggesting that when utilizing messages that emphasize consequences, the use of imagination changes how effective a self- or other-referencing message can be.

This is important for advertisers to consider because these small changes across millions of viewers could have tremendous differences in the rise of obesity across the nation. While in non-imagination conditions, it was shown that loss-framed self-referencing conditions produce the most positive attitudes and perceived behavioral control, when attempting to strengthen that with imagination, the optimal reference-level flips. Instead, when evoking imagination, advertisers should be careful to either emphasize the benefits for the viewer, or the emphasize the loses for another person. These findings can be explained in two ways. First, when emphasizing benefits, talking about the self gives the viewer a better understanding of what they can gain and thus makes them feel better about the behavior and their ability to perform it. Second, when emphasizing loses, it is best to make this about another person rather than the viewer because they can learn from the mistakes of others instead of seeing their own failure as an inevitability by imagining it. It is very possible that imagining things creates a

memory, due to memory and imagination using the same cognitive processes (Levine et al., 1998), so a memory of the future can be a type of self-fulfilling prophesy.

CHAPTER 6: LIMITATIONS AND FUTURE RESEARCH

6.1 LIMITATIONS

While this study has interesting findings, there are limitations. One of the first limitations is that many of the results were not significant once a simple effects test was conducted. The means tended to differ in the predicted directions, but without clear patterns and statistical significance, conclusions here should be taken with a grain of salt and not at face value. Another limitation is that, while there is other research into the effects of imagination, it is difficult to measure exactly when participants are imagining. The key part of this manipulation was that it was a stark contrast between conditions. However, when attempting to measure how much a participant imagined something, or the ease with which they were able to imagine there were almost no differences with a variety of measures. A third limitation is that the messages were simple text. Other types of advertisements, such as TV spots, might produce different effects. A fourth limitation with researching imagination is that people tend to find ways to avoid the undesirable outcomes emphasized by losses (Broemer, 2004). Due to this, it is suggested that messages be vivid as a way to moderate reactions to health messages (Broemer, 2004). The limitation here is that vividness was not measured or manipulated. A final general limitation is that the analysis of intention did not take into account actual exercise habits.

There were also methodological limitations. First, there were issues with the measurements for subjective norm and intention. For subjective norm, there was an overall very high rating of normativity across all conditions. This could be due to the wording of the scale items used to assess normativity. One scale item, unintentionally, contained a double-barreled question asking about “friends and family” and not separate

questions for these two. One of the other questions asked about “people who are important to me” which is vague and could mean someone the participant knows in real life or another person that they do not know. These measurement issues lead to inconsistent results for subjective norm. One issue with measuring intention is that certain people already intend to exercise. If someone is a regular exerciser, they will most likely still intend to keep exercising regardless of this brief message. Thus, this skews the data. This skew was discovered earlier in the analysis with a visual inspection of a histogram for intention as well as higher values for skewness and kurtosis than other variables (See Appendix C: Table 1). Thus, while the data did not support the hypothesis, it is not conclusive due to covariance of intention to perform a behavior with actual exercise habits. Almost nothing would be able to influence someone to exercise more if they already exercise daily. This issue of covariance lead to inconsistent results for intention.

6.2 FUTURE RESEARCH

Future research could see if this directional effect is found in other types of advertisements other than printed messages. It would be particularly useful to see if the effects are the same across TV, online video advertisements or radio. Future research should address issues with measuring perceived norm. It could be possible that there are generally no effects for perceived norm towards exercise, but this study is not conclusive. Future research should gather enough data to properly analyze the role of exercise habits on intention. Finally, a future meta-analyses could try to take into account if messages were purely factual or if they used language that could influence participants to visualize

the outcomes rather than consider them. This could be used to see if slight differences for gain-framed messages would be strengthened when this is accounted for.

REFERENCES

- Abhyankar, P., O'Connor, D. B., & Lawton, R. (2008). The role of message framing in promoting MMR vaccination: Evidence of a loss-frame advantage. *Psychology, Health and Medicine, 13*, 1-16.
- Ajzen, I. (2006). Constructing a theory of planned behavior questionnaire. *Unpublished Manuscript*.
- Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. *Action Control, 2*, 11-39.
- Ajzen, I. (2002). Perceived behavioral control, Self-Efficacy, locus of control, and the theory of planned Behavior¹. *Journal of Applied Social Psychology, 32*, 665-683.
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*, 179-211.
- America's Health Literacy: Why We Need Accessible Health Information. (2008).
- Anderson, C. A. (1983). Imagination and expectation: The effect of imagining behavioral scripts on personal influences. *Journal of Personality and Social Psychology, 45*, 293.
- Aspinwall, L. G. (2005). The psychology of future-oriented thinking: From achievement to proactive coping, adaptation, and aging. *Motivation and Emotion, 29*, 203-235.
- Atance, C. M., & O'Neill, D. K. (2001). Episodic future thinking. *Trends in Cognitive Sciences, 5*, 533-539.
- Bandura, A. (2006). Guide for constructing self-efficacy scales. *Self-Efficacy Beliefs of Adolescents, 5*, 307-337.

- Bandura, A. (1991). Social cognitive theory of moral thought and action. *Handbook of moral behavior and development*, 1, 45-103.
- Bem, D. (1972). Self-perception theory. *Advances in Experimental Social Psychology*, 5, 1-62.
- Beres, D. (1960). Perception, imagination and reality. *The International Journal of Psycho-Analysis*, 41, 327.
- Berry, T. R., & Carson, V. (2010). Ease of imagination, message framing, and physical activity messages. *British Journal of Health Psychology*, 15, 197-211.
- Block, L. G. (2005). Self-referenced fear and guilt appeals: The moderating role of self-construal. *Journal of Applied Social Psychology*, 35, 2290-2309.
- Broemer, P. (2004). Ease of imagination moderates reactions to differently framed health messages. *European Journal of Social Psychology*, 34, 103-119.
- Burnkrant, R. E., & Unnava, H. R. (1989). Self-Referencing A Strategy for Increasing Processing of Message Content. *Personality and Social Psychology Bulletin*, 15, 628-638.
- Burnkrant, R. E., & Unnava, H. R. (1995). Effects of self-referencing on persuasion. *Journal of Consumer Research*, 22, 17-26.
- Carroll, J. S. (1978). The effect of imagining an event on expectations for the event: An interpretation in terms of the availability heuristic. *Journal of Experimental Social Psychology*, 14, 88-96.
- Casler, K., Bickel, L., & Hackett, E. (2013). Separate but equal? A comparison of participants and data gathered via Amazon's MTurk, social media, and face-to-face behavioral testing. *Computers in Human Behavior*, 29, 2156-2160.

- Caspersen, C. J., Powell, K. E., & Christenson, G. M. (1985). Physical activity, exercise, and physical fitness: definitions and distinctions for health-related research. *Public Health Reports*, 100, 126.
- Chang, C. (2011). Enhancing Self-Referencing to Health Messages. *Journal of Consumer Affairs*, 45, 147-164.
- Chapman, S. (2009, March 06). Australian Better Health Initiative - Measure up Campaign 2009-10. Retrieved February 21, 2017, from <https://www.anao.gov.au/work/assurance-activity/australian-better-health-initiative-measure-campaign-2009-10>
- Cohen, J. (1992). A power primer. *Psychological bulletin*, 112, 155.
- de Bruijn, G. J., & Budding, J. (2016). Temporal consequences, message framing, and consideration of future consequences: Persuasion effects on adult fruit intake intention and resolve. *Journal of Health Communication*, 21, 944-953.
- Ersner-Hersfield, H., Garton, M. T., Ballard, K., Samanez-Larkin, G. R., & Knutson, B. (2009). Don't stop thinking about tomorrow: Individual differences in future self-continuity account for saving. *Judgment and Decision Making*, 4, 280.
- Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, 41, 1149-1160.
- Flegal, K. M., Carroll, M. D., Kit, B. K., & Ogden, C. L. (2012). Prevalence of obesity and trends in the distribution of body mass index among US adults, 1999-2010. *Jama*, 307, 491-497.

- Gallagher, K. M., & Updegraff, J. A. (2012). Health message framing effects on attitudes, intentions, and behavior: a meta-analytic review. *Annals of Behavioral Medicine*, 43, 101-116.
- Goldstein, N. J., & Cialdini, R. B. (2007). The spyglass self: a model of vicarious self-perception. *Journal of Personality and Social Psychology*, 92, 402.
- Gollwitzer, P. M. (1999). Implementation intentions: Strong effects of simple plans. *American Psychologist*, 54, 493.
- Goodman, J. K., Cryder, C. E., & Cheema, A. (2013). Data collection in a flat world: The strengths and weaknesses of Mechanical Turk samples. *Journal of Behavioral Decision Making*, 26, 213-224.
- Gregory, W. L., Cialdini, R. B., & Carpenter, K. M. (1982). Self-relevant scenarios as mediators of likelihood estimates and compliance: Does imagining make it so?. *Journal of Personality and Social Psychology*, 43, 89.
- Holman, E. A., & Silver, R. C. (2005). Future-oriented thinking and adjustment in a nationwide longitudinal study following the September 11th terrorist attacks. *Motivation and Emotion*, 29, 385-406.
- Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica: Journal of the Econometric Society*, 263-291.
- Keller, A. P. (2006). Regulatory focus and efficacy of health messages. *Journal of Consumer Research*, 33, 109-114.
- Keller, P. A., & Block, L. G. (1999). The effect of affect-based dissonance versus cognition-based dissonance on motivated reasoning and health-related persuasion. *Journal of Experimental Psychology: Applied*, 5, 302.

- Kingsbury, J. H., Gibbons, F. X., & Gerrard, M. (2015). The effects of social and health consequence framing on heavy drinking intentions among college students. *British Journal of Health Psychology*, 20, 212-220.
- Latimer, A. E., Salovey, P., & Rothman, A. J. (2007). The effectiveness of gain-framed messages for encouraging disease prevention behavior: is all hope lost?. *Journal of Health Communication*, 12, 645-649.
- Levine, B., Black, S.E., Cabeza, R., Sinden, M., McIntosh, A.R., Toth, J.P., Tulving, E., & Struss, D.T. (1998). Episodic memory and the self in a case of isolated retrograde amnesia. *Brain*, 121, 1951– 1973.
- Libby, L. K., Shaeffer, E. M., Eibach, R. P., & Slemmer, J. A. (2007). Picture yourself at the polls: Visual perspective in mental imagery affects self-perception and behavior. *Psychological Science*, 18, 199-203.
- Lord, C. G. (1987). Imagining self and others: Reply to Brown, Keenan, and Potts.
- Loroz, P. S. (2007). The interaction of message frames and reference points in prosocial persuasive appeals. *Psychology & Marketing*, 24, 1001-1023.
- Miller, C. H., Lane, L. T., Deatrck, L. M., Young, A. M., & Potts, K. A. (2007). Psychological reactance and promotional health messages: The effects of controlling language, lexical concreteness, and the restoration of freedom. *Human Communication Research*, 33, 219-240.
- O'Keefe, D. J. (2003). Message properties, mediating states, and manipulation checks: Claims, evidence, and data analysis in experimental persuasive message effects research. *Communication Theory*, 13, 251-274.

- O'Keefe, D. J., & Jensen, J. D. (2007). The relative persuasiveness of gain-framed loss-framed messages for encouraging disease prevention behaviors: A meta-analytic review. *Journal of Health Communication, 12*, 623-644.
- Paolacci, G., Chandler, J., & Ipeirotis, P. G. (2010). Running experiments on amazon mechanical turk.
- Rewind the Future. (2013). Retrieved February 21, 2017, from <http://www.strong4life.com/pages/healthy-eating/videos/rewind-the-future>
- Roberto, A. J., Goodall, C. E., West, P. M., & Mahan, J. D. (2010). Persuading physicians to test their patients' level of kidney functioning: The effects of message frame and point of view. *Health Communication, 25*, 107-118.
- Rothman, A. J., Salovey, P., Antone, C., Keough, K., & Martin, C. D. (1993). The influence of message framing on intentions to perform health behaviors. *Journal of Experimental Social Psychology, 29*, 408-433.
- Rothman, A. J., & Salovey, P. (1997). Shaping perceptions to motivate healthy behavior: the role of message framing. *Psychological bulletin, 121*, 3.
- Saris, W., Revilla, M., Krosnick, J. A., & Shaeffer, E. M. (2010, May). Comparing questions with agree/disagree response options to questions with item-specific response options. *Survey Research Methods, 4*, 61-79.
- Strathman, A., Gleicher, F., Boninger, D. S., & Edwards, C. S. (1994). The consideration of future consequences: Weighing immediate and distant outcomes of behavior. *Journal of Personality and Social Psychology, 66*, 742.
- Treadwell, J. R., & Lenert, L. A. (1999). Health values and prospect theory. *Medical Decision Making, 19*, 344-352.

- Trotto, P. A., & Tracy, R. J. (2001). The Effect of Message Framing and Imagination on Breast Self-Examination Compliance. *22nd Conference of the American Association for the Study of Mental Imagery, Milwaukee, Wisconsin.*
- U.S. healthcare and pharma industry digital ad spend 2015 | Statistic. (2016).
- Wheeler, S. C., DeMarree, K. G., & Petty, R. E. (2007). Understanding the role of the self in prime-to-behavior effects: The active-self account. *Personality and Social Psychology Review, 11*, 234-261.
- Wirtz, J. G., & Zimbres, T. M. (2015). Is It Good for Me or Good for Somebody Else? A Test of The Effect of Message Framing and Self-Referencing Message Engagement, Attitude Toward the Ad and Behavioral Intention. *American Academy of Advertising. Conference. Proceedings*, Online, 91.
- Witte, K., & Allen, M. (2000). A meta-analysis of fear appeals: Implications for effective public health campaigns. *Health Education & Behavior, 27*, 591-615.

APPENDIX A: STIMULI

IMAGINATION - 198 words 1 Gain-Frame – Self-Referencing	IMAGINATION – 205 words 5 Loss-frame – Self-referencing
<p>When you develop a regular habit of exercise and physical activity, you are doing something that can have short-term and long-term benefits for your health.</p> <p><u>Take a moment to visualize a healthy version of yourself 20 years in the future.</u></p> <p>If you exercised regularly most or all of those 20 years, you will have greatly increased your chances of enjoying many important health benefits as you aged.</p> <p><u>In the short-term, you should see yourself enjoying health benefits such as looking lean and toned and feeling energetic. In the long run, you should imagine how you will feel knowing that you have increased your chances that other good things will happen with your health, such as having a strong immune system and remaining cancer-free. Regular exercise will also make your heart and lungs stronger, so think about how much happier you will feel and how much more confident you will be that you will live to old age.</u></p> <p><u>So take some time every day to visualize yourself and all the good things that can come from your regular exercise and physical activity routine.</u></p> <p>If you start exercising regularly today, you will <u>reap the benefits</u> now and in the future!</p>	<p>When you fail to develop a regular habit of exercise and physical activity, you are risking short-term and long-term consequences for your health.</p> <p><u>Take a moment to visualize an unhealthy version of yourself 20 years in the future.</u></p> <p>If you didn't exercise regularly most or all of those 20 years, you will have greatly increased your chances of suffering many health problems as you aged.</p> <p><u>In the short-term, you should see yourself as someone who looks bloated and flabby and feeling out of shape. In the long run, you should imagine how you will feel knowing that you have increased your chances that other bad things will happen with your health, such as having a weaker immune system and an increased risk of certain types of cancer. Failing to exercise regularly will also mean that your heart and lungs will be weaker, so think about how much more upset and worried you will be that you will die before reaching old age.</u></p> <p><u>So take some time every day to visualize yourself and all the bad things that can happen if you fail to exercise regularly or become more sedentary.</u></p> <p>If you don't start exercising today, you will <u>suffer consequences</u> now and in the future!</p>

<p>IMAGINATION – 194 words 2 Gain-Frame – Other-Referencing</p> <p>People who develop a regular habit of exercise and physical activity are doing something that can have short-term and long-term benefits for their health.</p> <p><u>Take a moment to visualize a healthy person 20 years from now.</u></p> <p>If they exercised regularly most or all of those 20 years, they will have greatly increased their chances of enjoying many important health benefits as they aged.</p> <p><u>In the short-term, that person could be seen enjoying health benefits such as looking lean and toned and feeling energetic. In the long run, imagine how they will feel knowing that they have increased their chances that other good things will happen with their health, such as having a strong immune system and remaining cancer-free. Regular exercise will also make their heart and lungs stronger, so think about how much happier that person will feel and how much more confident they will be that they will live to old age.</u></p> <p><u>So take some time every day to visualize all the good things that can happen if someone exercises regularly and has a physical activity routine.</u></p> <p>If someone starts exercising regularly today, they will <u>reap the benefits</u> now and in the future!</p>	<p>IMAGINATION – 202 words 6 Loss-frame – Other-referencing</p> <p>People who fail to develop a regular habit of exercise and physical activity are risking short-term and long-term consequences for their health.</p> <p><u>Take a moment to visualize an unhealthy person 20 years from now.</u></p> <p>If they didn't exercise regularly most or all of those 20 years, they will have greatly increased their chances of suffering many health problems as they aged.</p> <p><u>In the short-term, that person could be seen as someone who looks bloated and flabby and feels out of shape. In the long run, imagine how they will feel knowing that they have increased their chances that other bad things will happen with their health, such as having a weaker immune system and an increased risk of certain types of cancer. Failing to exercise regularly will also mean that their heart and lungs will be weaker, so think about how much more upset and worried that person will be that they will die before reaching old age.</u></p> <p><u>So take some time every day to visualize all of the bad things that can happen if someone fails to exercise regularly or becomes more sedentary.</u></p> <p>If someone does not start exercising regularly today, they will <u>suffer consequences</u> now and in the future!</p>
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NON-IMAGINATION – 189 words 3 Gain-Frame – Self-Referencing	NON-IMAGINATION – 192 words 7 Loss-frame – Self-referencing
<p>When you develop a regular habit of exercise and physical activity, you are doing something that can have short-term and long-term benefits for your health.</p> <p><u>Research has shown that as you age, healthy habits like an exercise routine impact your future health.</u></p> <p>If you exercise regularly, you will increase your chances of enjoying many important health benefits as you age.</p> <p><u>The benefits of a physically active lifestyle are enormous. In the short-term, you will enjoy health benefits such as looking fit and feeling energetic. In the long run, you should feel good knowing that you have increased your chances that other good things will happen with your health, such as having a strong immune system and remaining cancer-free. Regular exercise will also make your heart and lungs stronger, making you feel much happier and much more confident you will be that you will live to old age.</u></p> <p><u>So take some time every day to consider for yourself all of the good things that can come from your regular exercise and physical activity routine.</u></p> <p>If you start exercising regularly today, you will <u>reap the benefits</u> now and in the future!</p>	<p>When you fail to develop a regular habit of exercise and physical activity, you are risking short-term and long-term consequences for your health.</p> <p><u>Research has shown that as you age, healthy habits like an exercise routine impact your future health.</u></p> <p>If you don't exercise regularly, you will increase your chances of suffering many health complications as you age.</p> <p><u>The consequences of a sedentary lifestyle are enormous. In the short-term, you will risk looking unfit and feeling out of shape. In the long run, you should feel sad knowing that you have increased your chances that other bad things will happen with your health, such as having a weaker immune system and an increased risk of certain types of cancer. Failing to exercise regularly will also mean that your heart and lungs will be weaker, so you will be much more upset and worried that you will die before reaching old age.</u></p> <p><u>So take some time to consider for yourself all of the bad things that can happen if you fail to exercise regularly or become more sedentary.</u></p> <p>If you don't start exercising regularly today, you <u>suffer consequences</u> now and in the future!</p>

NON-IMAGINATION – 186 words 4 Gain-Frame – Other-Referencing	NON-IMAGINATION – 194 words 8 Loss-frame – Other-referencing
<p>People who develop a regular habit of exercise and physical activity are doing something that can have short-term and long-term benefits for their health.</p> <p><u>Research has shown that as people age, healthy habits like an exercise routine impact their future health.</u></p> <p>If someone exercises regularly, they will increase their chances of enjoying many important health benefits as they age.</p> <p><u>The benefits of a physically active lifestyle are enormous. In the short-term, they will enjoy health benefits such as looking fit and feeling energetic. In the long run, they should feel good knowing that they have increased their chances that other good things will happen with their health, such as having a strong immune system and remaining cancer-free. Regular exercise will also make their heart and lungs stronger, making them feel much happier and much more confident that they will live to old age.</u></p> <p><u>So take some time every day to consider all of the good things that can happen for someone who exercises regularly and has a physical activity routine.</u></p> <p>If someone starts exercising regularly today, they will <u>reap the benefits</u> now and in the future!</p>	<p>People who fail to develop a regular habit of exercise and physical activity are risking short-term and long-term consequences for their health.</p> <p><u>Research has shown that as people age, healthy habits like an exercise routine impact their future health.</u></p> <p>If someone does not exercise regularly, they will increase their chances of suffering many health complications as they age.</p> <p><u>The consequences of a sedentary lifestyle are enormous. In the short-term, someone will risk looking unfit and feeling out of shape. In the long run, they should feel sad knowing that they have increased their chances that other bad things will happen with their health, such as having a weaker immune system and an increased risk of certain types of cancer. Failing to exercise regularly will also mean that their heart and lungs will be weaker, so they will be much more upset and worried that they will die before reaching old age.</u></p> <p><u>So take some time every day to consider all of the bad things that can happen for someone who fails to exercise regularly or becomes more sedentary.</u></p> <p>If someone do not start exercising regularly today, they <u>suffer consequences</u> now and in the future!</p>

APPENDIX B: QUESTIONNAIRE

NOTE: Participants did NOT see the numerical value used for coding

For me, exercising for at least 30 minutes, three or more times per week for the next three months would be

- ☐ Extremely unpleasant (1)
- ☐ Moderately unpleasant (2)
- ☐ Slightly unpleasant (3)
- ☐ Neither pleasant nor unpleasant (4)
- ☐ Slightly pleasant (5)
- ☐ Moderately pleasant (6)
- ☐ Extremely pleasant (7)

Starting a new exercise routine where I exercise at least 30 minutes three or more times per week for the next three months would be

- ☐ Extremely unpleasant (1)
- ☐ Moderately unpleasant (2)
- ☐ Slightly unpleasant (3)
- ☐ Neither pleasant nor unpleasant (4)
- ☐ Slightly pleasant (5)
- ☐ Moderately pleasant (6)
- ☐ Extremely pleasant (7)

For me, being a person who exercises regularly would be

- ☐ Extremely unpleasant (1)
- ☐ Moderately unpleasant (2)
- ☐ Slightly unpleasant (3)
- ☐ Neither pleasant nor unpleasant (4)
- ☐ Slightly pleasant (5)
- ☐ Moderately pleasant (6)
- ☐ Extremely pleasant (7)

Exercising for at least 30 minutes, three or more times per week for the next three months would be

- ☐ Extremely difficult (1)
- ☐ Moderately difficult (2)
- ☐ Slightly difficult (3)
- ☐ Neither easy nor difficult (4)
- ☐ Slightly easy (5)
- ☐ Moderately easy (6)
- ☐ Extremely easy (7)

Exercising, even when I don't want to would be

- ☐ Extremely difficult (1)
- ☐ Moderately difficult (2)
- ☐ Slightly difficult (3)
- ☐ Neither easy nor difficult (4)
- ☐ Slightly easy (5)
- ☐ Moderately easy (6)
- ☐ Extremely easy (7)

Skipping things I enjoy in order to exercise would be

- ☐ Extremely difficult (1)
- ☐ Moderately difficult (2)
- ☐ Slightly difficult (3)
- ☐ Neither easy nor difficult (4)
- ☐ Slightly easy (5)
- ☐ Moderately easy (6)
- ☐ Extremely easy (7)

I feel confident that I can perform an exercise routine for at least 30 minutes, three or more times per week for the next three months.

- ☐ Strongly disagree (1)
- ☐ Moderately disagree (2)
- ☐ Slightly disagree (3)
- ☐ Neither agree nor disagree (4)
- ☐ Slightly agree (5)
- ☐ Moderately agree (6)
- ☐ Strongly agree (7)

I am certain I CANNOT motivate myself to exercise for at least 30 minutes, three or more times per week for the next three months.

- ☐ Strongly disagree (1)
- ☐ Moderately disagree (2)
- ☐ Slightly disagree (3)
- ☐ Neither agree nor disagree (4)
- ☐ Slightly agree (5)
- ☐ Moderately agree (6)
- ☐ Strongly agree (7)

I can make time in my schedule to exercise

- ☐ Strongly disagree (1)
- ☐ Moderately disagree (2)
- ☐ Slightly disagree (3)
- ☐ Neither agree nor disagree (4)
- ☐ Slightly agree (5)
- ☐ Moderately agree (6)
- ☐ Strongly agree (7)

Most people who are important to me approve of my exercising for at least 30 minutes, three times per week for the next three months.

- ☐ Strongly disagree (1)
- ☐ Moderately disagree (2)
- ☐ Slightly disagree (3)
- ☐ Neither agree nor disagree (4)
- ☐ Slightly agree (5)
- ☐ Moderately agree (6)
- ☐ Strongly agree (7)

My friends and family would NOT support me if I decided to exercise for at least 30 minutes, three times per week for the next three months.

- ☐ Strongly disagree (1)
- ☐ Moderately disagree (2)
- ☐ Slightly disagree (3)
- ☐ Neither agree nor disagree (4)
- ☐ Slightly agree (5)
- ☐ Moderately agree (6)
- ☐ Strongly agree (7)

Most people would approve of the decision to exercise for 30 minutes, three times per week for the next three months

- ☐ Strongly disagree (1)
- ☐ Moderately disagree (2)
- ☐ Slightly disagree (3)
- ☐ Neither agree nor disagree (4)
- ☐ Slightly agree (5)
- ☐ Moderately agree (6)
- ☐ Strongly agree (7)

The likelihood that I would or will exercise for at least 30 minutes, three or more times per week for the next three months is

- ☐ Extremely unlikely (1)
- ☐ Moderately unlikely (2)
- ☐ Slightly unlikely (3)
- ☐ Neither likely nor unlikely (4)
- ☐ Slightly likely (5)
- ☐ Moderately likely (6)
- ☐ Extremely likely (7)

For the foreseeable future, I would characterize the likelihood that I would or will exercise for at least 30 minutes, three or more times per week for the next three months as

- ☐ Extremely unlikely (1)
- ☐ Moderately unlikely (2)
- ☐ Slightly unlikely (3)
- ☐ Neither likely nor unlikely (4)
- ☐ Slightly likely (5)
- ☐ Moderately likely (6)
- ☐ Extremely likely (7)

The likelihood that I would NOT or will NOT exercise for at least 30 minutes, three or more times per week for the next three months is

- ☐ Extremely unlikely (1)
- ☐ Moderately unlikely (2)
- ☐ Slightly unlikely (3)
- ☐ Neither likely nor unlikely (4)
- ☐ Slightly likely (5)
- ☐ Moderately likely (6)
- ☐ Extremely likely (7)

APPENDIX C: TABLES AND FIGURES

**TABLE 1: DESCRIPTIVE STATISTICS FOR ALL OUTCOME VARIABLES
MEANS, SD, SKEWNESS AND KURTOSIS FOR ALL VARIABLES**

Variable	Skewness	SE	Kurtosis	SE
Attitude	-0.73	0.14	-0.40	0.29
Subjective Norm	-1.62	0.15	2.21	0.29
Perceived Behavioral Control	0.04	0.15	-0.77	0.29
Intention	-0.65	0.15	-0.56	0.29
Self- Efficacy	-0.83	0.15	-0.18	0.29

TABLE 2: IMAGINATION CONDITION MEANS

Variable	Self-Referencing				Other-Referencing			
	Gain		Loss		Gain		Loss	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Attitude	5.31	1.55	4.82	2.00	4.27	1.92	5.28	1.41
Subjective Norm	6.38	0.91	6.10	1.29	5.81	1.49	6.05	1.22
Perceived Behavioral Control	4.35	1.70	3.78	1.62	3.51	1.59	4.38	1.27
Intention	5.00	1.78	5.04	2.03	4.26	2.08	5.40	1.63
Self-Efficacy	5.80	1.37	5.56	1.49	4.89	1.74	5.93	1.11

TABLE 3: NON-IMAGINATION CONDITION MEANS

Variable	Self-Referencing				Other-Referencing			
	Gain		Loss		Gain		Loss	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Attitude	5.13	1.75	5.48	1.47	4.91	1.48	5.08	1.54
Subjective Norm	6.18	1.18	6.24	1.21	6.16	0.97	6.29	1.04
Perceived Behavioral Control	3.79	1.45	4.37	1.55	3.57	1.21	4.12	1.53
Intention	5.09	1.56	5.38	1.63	4.99	1.62	5.40	1.85
Self-Efficacy	5.36	1.52	5.95	1.21	5.57	1.30	5.68	1.36

TABLE 4: CORRELATION MATRIX

		Attitude	PBC	Efficacy	Norm	Intention
Attitude	Pearson's r	—	0.746	0.742	0.349	0.800
	p-value	—	< .001	< .001	< .001	< .001
	Spearman's rho	—	0.746	0.741	0.322	0.773
	p-value	—	< .001	< .001	< .001	< .001
PBC	Pearson's r		—	0.645	0.187	0.719
	p-value		—	< .001	0.002	< .001
	Spearman's rho		—	0.657	0.137	0.717
	p-value		—	< .001	0.023	< .001
Efficacy	Pearson's r			—	0.402	0.822
	p-value			—	< .001	< .001
	Spearman's rho			—	0.379	0.851
	p-value			—	< .001	< .001
Norm	Pearson's r				—	0.255
	p-value				—	< .001
	Spearman's rho				—	0.273
	p-value				—	< .001
Intention	Pearson's r					—
	p-value					—
	Spearman's rho					—
	p-value					—

FIGURE 1: REWIND THE FUTURE



FIGURE 2: MEASURE UP



FIGURE 3: NON-IMAGINATION ATTITUDE PLOT MEANS PLOT

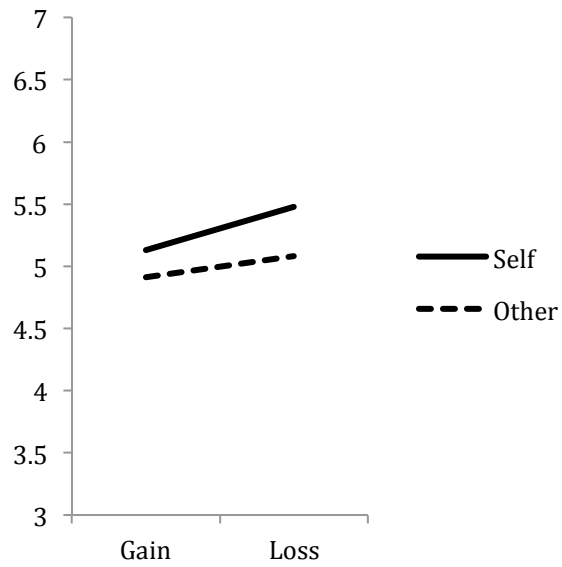


FIGURE 4: IMAGINATION ATTITUDE PLOT MEANS PLOT

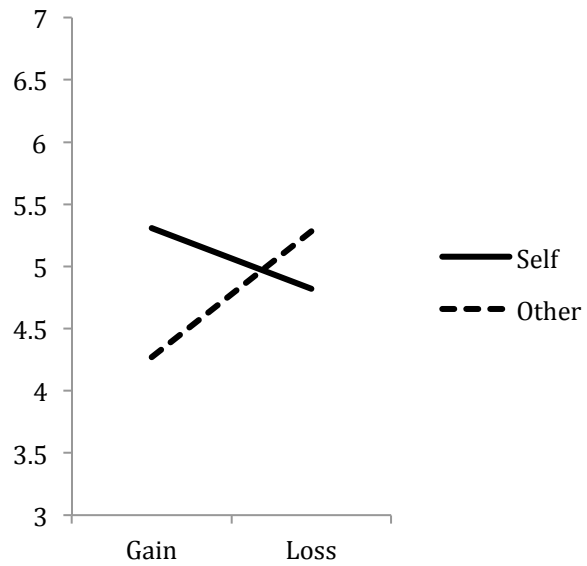


FIGURE 5: NON-IMAGINATION SUBJECTIVE NORM MEANS PLOT

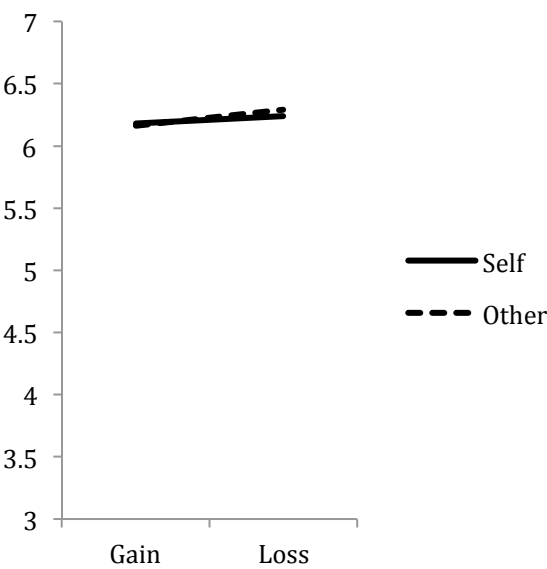


FIGURE 6: IMAGINATION SUBJECTIVE NORM MEANS PLOT

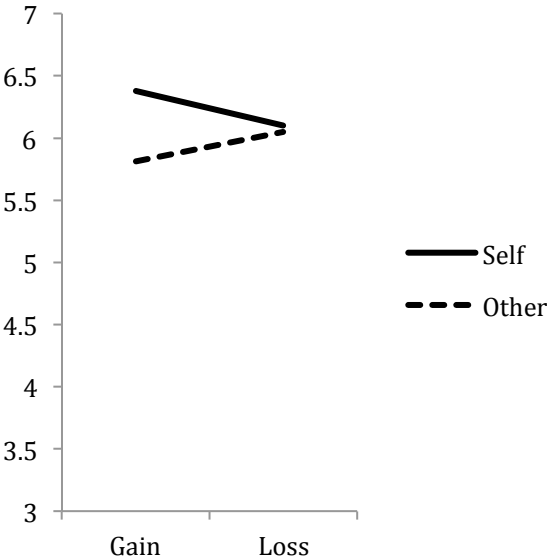


FIGURE 7: NON-IMAGINATION PERCEIVED BEHAVIORAL CONTROL MEANS PLOT

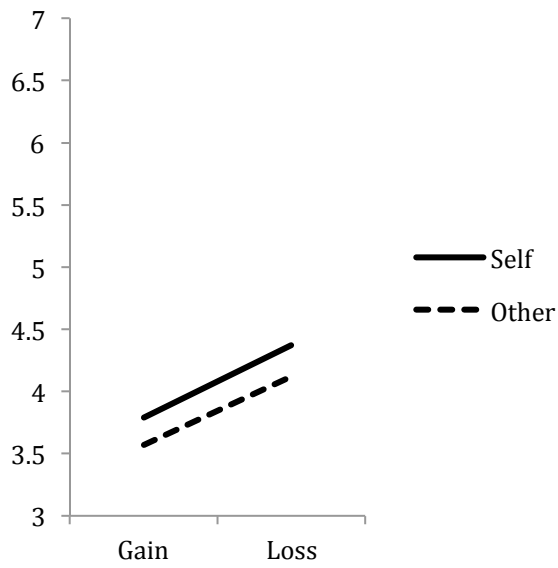


FIGURE 8: IMAGINATION PERCEIVED BEHAVIORAL CONTROL MEANS PLOT

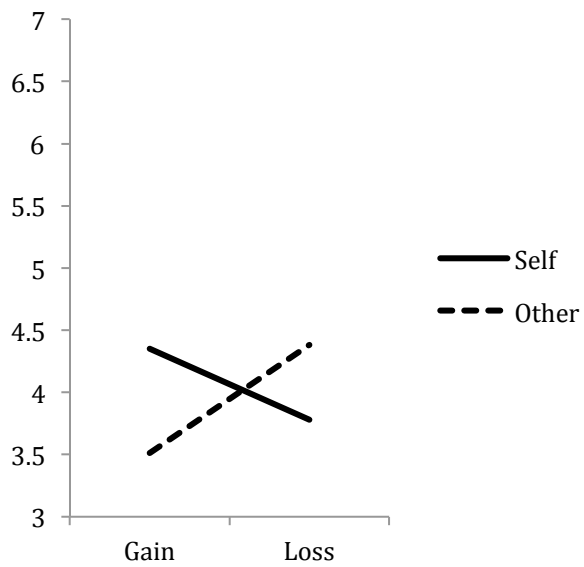


FIGURE 9: NON-IMAGINATION SELF-EFFICACY MEANS PLOT

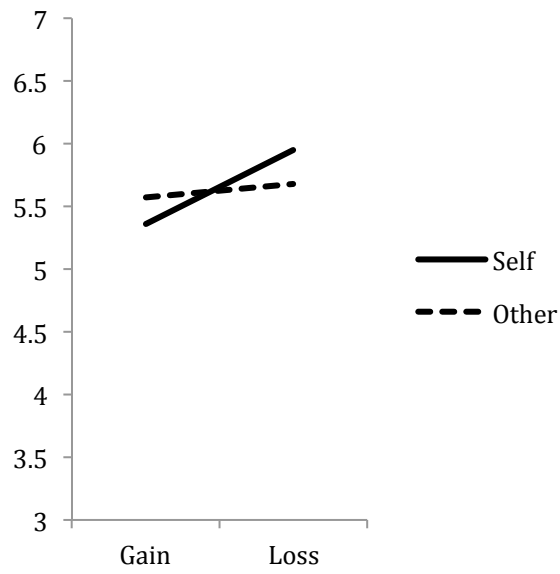


FIGURE 10: IMAGINATION SELF-EFFICACY MEANS PLOT

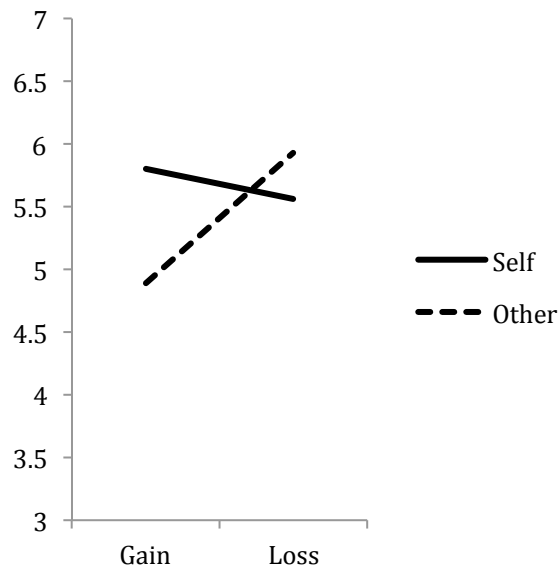


FIGURE 11: NON-IMAGINATION INTENTION MEANS PLOT

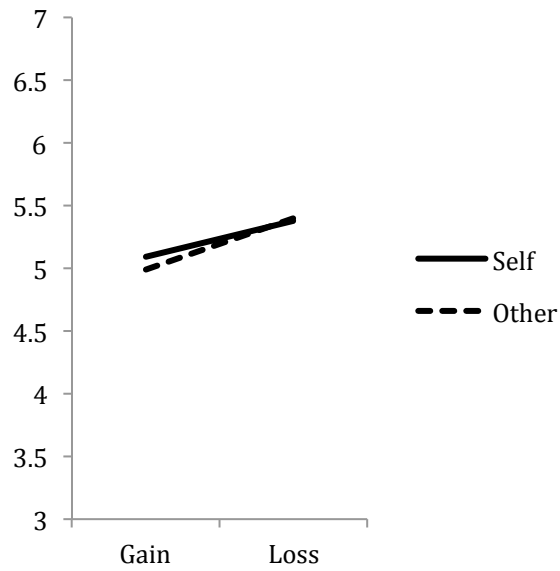


FIGURE 12: IMAGINATION INTENTION MEANS PLOT

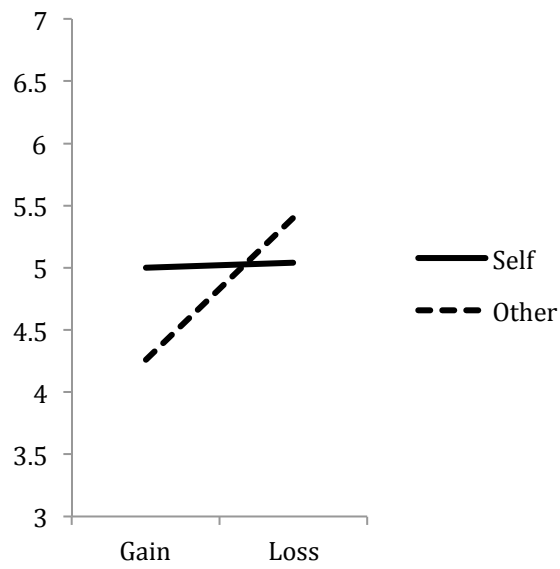


FIGURE 13: “IMAGINE YOURSELF” AD

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