

A Tale of Two Frames: A Study on the Effects of Framed Health Messages on Autonomous Motivation for Physical Activity

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ABSTRACT

Background An area of interest for physical activity promotion has been the use of persuasive messages, specifically, the use of framing effects as a method of persuasive communication. One theory that has been used to investigate the mechanisms through which framed health messages affect physical activity motivation is the Self-Determination Theory (SDT). This study uses the SDT to investigate the effects of framed health messages on autonomous motivation for physical activity.

Methods 107 York University undergraduate students (N=107; 51 females, 56 males) ages 18 – 30 were recruited from the school of Kinesiology and Health Sciences. Participants were randomly assigned to one of three message groups: gain-framed, loss-framed and control. They were given and instructed to read the messages. Afterwards, the participants' autonomous motivation levels were measured.

Results No significant difference in autonomous regulation levels were observed between the three frame groups. However, a significant interaction was shown between participants' gender and frame condition; among the female participants, levels of autonomous regulation were significantly higher in the loss frame group, when compared to the control group.

Conclusions Based on the results of this study, women who were exposed to loss-framed messages tended to demonstrate higher levels of autonomy. Similar framing effects were not evident in males.

KEY WORDS: Self-Determination Theory, Physical Activity Promotion, Health Promotion, Framed Health Messages, Autonomous Motivation

1 | INTRODUCTION

The Greek philosopher Plato stated: “In order for man to succeed in life, God provided him with two means, education and physical activity”. May Plato’s God smile favorably upon us as we attempt to further educate ourselves about physical activity.

The health benefits of physical activity are undeniable (Paffenbarger et al., 1986; Chandrashekar, & Anand, 1991; Smith et al., 1995; Uusitupa et al., 2000; He & Baker, 2004). The unfortunate reality, however, is that it has been shown that only 15% of Canadian adults engage in adequate levels of physical activity (Colley et al., 2011). Hence, the next logical

step would be to study how we can increase physical activity participation. To this end, researchers have been thoroughly engaged in the field of physical activity promotion through the use of persuasive messages. One particular area of interest is the study of framing effects as a method of persuasive communication. The frame of a message reflects the emphasis of that message: a gain frame highlights the benefits of an activity, whereas a loss frame points out the costs of not engaging (Latimer et al., 2010). Regarding the effects of physical activity, an example of a gain-framed message can be “if you engage in physical activity, you will have improved health”, whereas a loss-framed message can resemble “if you do not engage in physical activity, your health will suffer”.

Framed messages have been extensively researched within the field of physical activity psychology; these studies have produced varying results with regards to physical activity promotion, with some studies showing greater impact of gain-framed messages on physical activity levels (Latimer et al., 2008; Latimer et al. 2010; Gallagher, & Updegraff, 2012) and some demonstrating the greater impact of loss-framed messages (Bassett-Gunter et al., 2013). Furthermore, research on the underlying mechanisms by which the framed messages exert their effects have been limited. Higgins & Spiegel (2004) have proposed that people tend to pay more attention to messages that are framed more in line with their personal predispositions. Put another way, risk averse people will adhere more to loss framed whereas those who are eager to improve will prefer the gain framed messages. Another possible mechanism points to the congruency of the messages with participants' thoughts and concerns regarding the subject (Updegraff et al., 2007). People who are more concerned about developing hypertension will pay closer attention to messages that mention a relationship between hypertension and the target behavior compared to messages that discuss relationships with the target behavior that are not hypertension related. There has been, however, a call for further research to understand other possible mechanisms (Rothman, & Updegraff, 2010).

One theory that has been used to investigate the mechanisms through which framed health messages affect physical activity motivation is the Self-Determination Theory (SDT). SDT is interested in one's motives for their behaviors (Deci, & Ryan, 2000). Within SDT, these motives are divided into two categories: "intrinsic motivation" and "extrinsic motivation". Intrinsic motivation refers to motives that are more internalized in nature; "I want to be physically active because I want to be healthy" would be a good example of intrinsic motivation regarding physical activity participation. In contrast, extrinsic motivation refers to motives based on external cues and social expectations that have been, to a limited degree, internalized. A good example of extrinsic motivation would be "I want to be physically active because I want to be accepted by my peers" (Deci & Ryan, 2002). It has been proposed that intrinsic motivation can be broken down further into subcategories (often termed "needs") that if satisfied, can lead to optimal growth and functionality. Autonomy is one these categories (DeCharmes, 1968). The role of autonomy within the SDT has also been noted by Deci & Ryan (2002). They define autonomous motives (often termed "autonomous regulations") as motives that arise from one's own willingness and desire to engage in a particular activity. What is intriguing about autonomous regulation is

that it has been shown that people are more satisfied with the outcome of their actions if their reasons for engagement are based on autonomous regulations (Senécal et al., 2000). It has also been demonstrated that exposure to gain framed messages, even for brief periods of time, can lead to the increased formation of autonomous regulations within the target audience (Segar et al., 2012).

The research on SDT theory as an explanatory model for the effects of framed messages has been exemplary. However, no research has been done that directly examines the framing effects of messages regarding physical activity on autonomous regulation. Hence, the purpose of this study is to investigate whether differences in autonomy levels are a consequence of framing. Based on the findings of Latimer et al. (2008) and Segar et al. (2012), we hypothesize that individuals exposed to gain-framed messages regarding physical activity will exhibit higher levels of autonomous regulation than those who receive loss-framed physical activity messages.

Some variables (called moderators) have been shown to affect the relationship between framed health messages and their effects on physical activity promotion. One such factor is biological sex (Schwarzer, 2008; Segar et al., 2012). This factor has been measured and accounted for in this study to distinguish the role of increased autonomous regulation from any potential effects of the moderating factor.

2 | METHODS

Study Design: this study used a randomized control design.

Participants: York University undergraduate students (N=107; 51 females, 56 males), ages 18-30, were recruited through an online portal (Kinesiology Undergraduate Research Experience - KURE). KURE is a research portal that allows undergraduate kinesiology students from York University to enroll in available studies. These 107 students were given bonus marks, in a course that was not taught by any of the researchers in this study, as a token of appreciation for their participation (Figure 1).

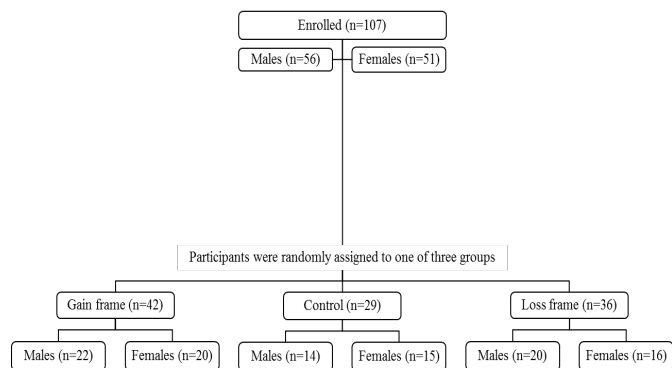


Figure 1. Breakdown of participants involved in the study.

Protocol: An online experiment was conducted using SurveyMonkey. An initial email was sent to all the participants through the KURE system providing them with a link to the study. One to two reminders were sent to participants who were unresponsive to the initial email. Participants were informed about the purpose of the study in the beginning of the survey and were asked to indicate their written consent. Upon consenting, the participants were asked to indicate their sex, then randomly assigned to one of three message groups: gain-framed, loss-framed and control. These groups were based on the type of framed physical activity message the participant was given. After reading the messages, the participants were asked to fill a previously validated questionnaire assessing autonomous motivation. Questions in the questionnaire were presented in a random order for each participant in order to minimize carryover effects (Tourangeau et al., 1989). Participants were, subsequently, granted their marks. The participants remained anonymous during the course of this survey.

This study was reviewed and approved by the Human Participants Review Sub-Committee, York University's Ethics Review Board and conforms to the standards of the Canadian Tri-Council Research Ethics guidelines (#E2016 - 335).

Framed physical activity messages: Three different types of messages regarding physical activity were present in this study. The gain-framed and loss-framed messages were taken from a previous study by Bassett-Gunter et al. (2014). Messages were chosen from this particular study because they were designed to be more meaningful to a university student. The control messages, however, had nothing to do with physical activity and were regarding "Secrets of University Success". These messages were taken from York University's website available at; <http://lss.info.yorku.ca/resources/10-secrets-of-university-success/>. Only the first 5 tips were listed as the control messages.

Autonomous regulation: To assess autonomy for physical activity in the participants, adapted items (Segar et al., 2012) were used from the Behavioral Regulation in Exercise Questionnaire (BREQ). Participants were instructed: "The following statements list reasons people often give when asked why they are or would become physically active. Whether you currently are physically active or not, please read each statement carefully and indicate whether or not each statement is or would be true for you personally if you decided to be physically active." Participants responded to four items, using a 7-point scale, from 1 (Not at all true) to 7 (Very true). The value for autonomous regulation was calculated using the following formula:
$$\frac{(\text{identified regulation} + \text{intrinsic regulation})}{2}$$
, and the value for controlled regulation was calculated using:
$$\frac{(\text{external regulation} + \text{introjected regulation})}{2}$$
, where the following variables are measured by the following statements: identified regulation, "I truly feel that being physically active is the best thing for me"; intrinsic regulation, "It feels good to be physically active"; external regulation, "I want others to see that I can do it"; introjected regulation, "I would feel bad about myself if I didn't try to be physically active." Higher scores indicate higher autonomous motivation for physical activity.

Statistical Analysis: A univariate analysis using IBM SPSS (version 24.0) was performed on the data to assess disparities in the different frame condition groups. To that end, frame condition was set as the fixed factor and autonomous regulation as the dependent variable. A second univariate analysis was done to discover any interactions between participants' gender, initial physical activity status and frame condition with regards to autonomous regulation. Upon discovery of an interaction between gender and frame condition, two further univariate analyses (one on each gender) were run to determine the gender which had within-group differences in autonomous regulation. Once it was realized that within-group differences in autonomous regulation existed in the female participants, a one-way ANOVA test was run on the females' autonomous regulation scores setting autonomous regulation as the dependent variable and the frame condition as a factor. Subsequently, a Tukey post hoc test was conducted to detect the nature of these within-group differences.

3 | RESULTS

Autonomous Regulation: Our initial analysis of the autonomous regulation levels of the three groups (Gain-Frame, Loss-Frame, and control) demonstrated no significant difference in autonomous regulation levels. Figure 2 shows the mean levels of autonomous regulation within the entire study population.

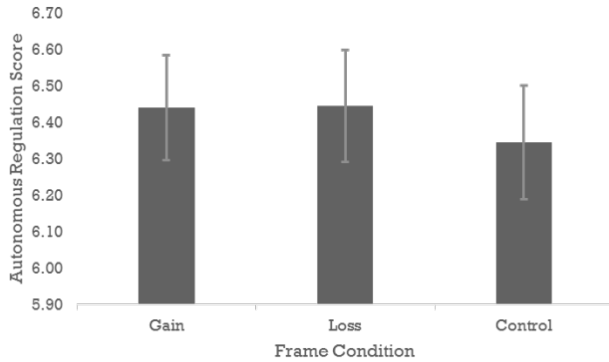


Figure 2. Mean levels of autonomous regulation in the entire sample by frame condition. Error bars show the standard error of the mean.

Upon further investigation however, and through the use of univariate analysis, a significant interaction was shown between participants' gender and frame condition, $F(2) = 4.65$, $p = 0.012$, $\eta^2_p = 0.089$. Additional analysis of the different genders demonstrated a significant difference between the mean levels of autonomous regulation in the female participants, $F(2) = 3.22$, $p = 0.049$. Similar differences were not observed in the male participants. Figure 3 shows the mean levels of autonomous regulation in the female participants.

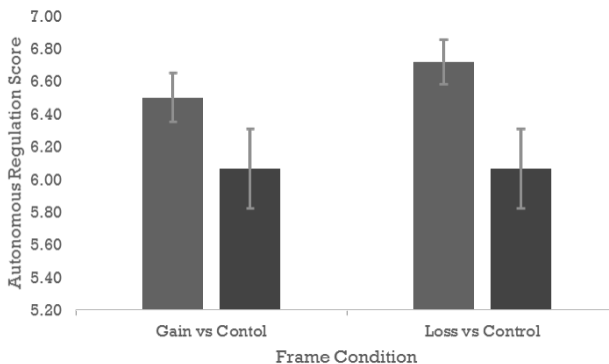


Figure 3. Mean levels of autonomous regulation in female participants by frame condition. Error bars show the standard error of the mean.

A subsequent post hoc analysis showed that the levels of autonomous regulation were significantly higher in the loss frame group when compared to the control group, within the

female participants, $p = 0.042$. Similar differences were not seen when comparing gain frame to control groups within the female participants.

4 | DISCUSSION

The findings of this study differed from our hypothesis; we expected the participants who received gain-framed messages to exhibit higher levels of autonomous regulation. This result is contrary to our findings, as in our study, women who were exposed to loss-framed messages exhibited higher levels of autonomy. In a study by Segar et al. (2012), the researchers found that women experience higher levels of autonomous regulation when exposed to gain-framed messages. While a source of intrigue, this contradiction can possibly be explained by further analysis into the different characteristics of the participants. The study done by Segar et al. (2012) recruited participants that were, on average, middle-aged. Participants in our study, however, were all young adults. This age difference can be a potential cause for the conflicting outcomes in our studies. This conclusion is not unreasonable if one considers the research on the age disparity of framing effects. These studies point to the increased influence of loss-framed messages in younger adults (Mikels, & Reed, 2009), theorizing that younger adults have a propensity to attend to negative information (loss-frame) more so than they do to positive (gain-framed) (Baumeister et al., 2001). Moreover, it has been demonstrated that older adults tend to be more impacted by positive (gain-framed) messages as opposed to their negative (loss-framed) counterparts (Carstensen, & Mikels, 2005; Shamaskin et al., 2010).

Another finding in our study was that framing effects present themselves, significantly, only amongst the female participants. This finding is in opposition to our initial hypothesis. Numerous studies exist that point to the existence of framing effects regardless of gender (Gallagher, & Updegraff, 2012; Bassett, et al., 2011; Latimer et al., 2010; Jones et al., 2003). The existence of such studies led to our failure to anticipate a gender disparity in framing effects within our participants. It is important to note that while we did not anticipate such differences, we included gender in our data analysis procedures to explore possible interactions, and it appears that all has not been for naught as a significant interaction was revealed. One possible explanation for these inconsistencies between the literature and our research results is that the aforementioned articles demonstrate framing effects with regards to dependent variables other than the one we were experimenting on (autonomy).

When we look at studies that examine the effects of framing on autonomy, we see a similar gender disparity in framing effects with women being the only group benefitting from framing (Segar et al., 2012). It is therefore reasonable to conclude that a gender disparity exists regarding framing effects on autonomy, as it manifests as women being the group on which framing exerts its effects.

Limitations

This study, of course, is not without its limitations, and must be interpreted with caution. First, our participant sample was relatively small and homogenous; the participants were all undergraduate students from one university. This homogeneity in age and education casts doubts on the generalizability of the results of the study. Second, use of multiple statistical tests on the same data set increases the possibility of type 1 errors occurring (Rothwell, 2005). Third, there were no baseline measurements done on participants' autonomous regulation levels. This lack of a baseline allows an astute observer to wonder whether changes observed in the participants' autonomy was due to framing effects or were preexisting differences. Fourth, there was no assessment of the physical activity behavior as a result of the framing effects under study. While there exists an abundance of studies linking increased autonomy to an increase in physical activity behavior (Hagger et al., 2003; Teixeira et al., 2012), one might still wonder whether an increase in autonomy levels translates to an increase in physical activity behavior within our study. Finally, we must note that the findings of this study are based on self-reported variables. Self-reporting of variables may result in a response bias towards more socially acceptable answers, which may challenge the authenticity of the results of this study.

Implications & Future Directions

An understanding of how to best frame health messages is of great value to healthcare professionals, governments, and anyone else who is seeking to promote physical activity through the use of messaging. The results of this study can be useful in the shaping of this understating. Furthermore, it is also recommended that future studies focus on how age and sex moderate the effects of framed messages on autonomous motivation for physical activity in broader and more diverse participant pools.

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