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The Joint Effect of Descriptive Social Norms and Anticipated Emotion on Distal Benefit Behavior: Proposing Emotional Descriptive Norms Messages (EDNMs) based on Message Design Approach using Verbal and Visual Cues

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by

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Dedication

To my family (Hye mi, and Mom. And, Dad in heaven), my gods (Isabella, Maria, and Dr. Ahn), and my angels (Gary, Anthony, Sandi, Anna, Dr. Kang, and Dr. Cho).

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you in the near future. Please, Robert.), and keep in mind that *I can write a paper alone if I can* (I've never thought about writing a paper alone for a publication but I think it'll be well worth challenging myself by doing it alone. When I feel confident enough to do, I'd like to ask for your advice again. Thank you so much.).

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Throughout my journey as a graduate student in the University of Texas at Austin, I have been experiencing two routes of research processes: one is a serious route and the other is a fun route. In the serious route, I could elaborate and scrutinize what I have read

in prior literature which has strong arguments as well as supporting evidences, which enabled me to carefully develop logical arguments in my research. I am honored to virtually meeting great scholars all over the world as well as learning from them via this serious route. Via the fun route using my heuristic things (e.g., my past experiences, both physical and emotional as well as both direct and indirect, anticipatory and anticipated emotions, feelings, moods, conversation with people around me, observation, music, art, etc.), I could add some new ideas to the existing literature and thus newly test the theoretical relationships hypothesized in the prior literature in my research. And, the two routes often occurred simultaneously, which, I believe, made my PhD life unique and special.

Okay, let me spend my time trying to change the world since I have started here 🤘

Please 🙏

☺

Abstract

The Joint Effect of Descriptive Social Norms and Anticipated Emotion on Distal Benefit Behavior: Proposing Emotional Descriptive Norms Messages (EDNMs) based on Message Design Approach using Verbal and Visual Cues

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The University of Texas at Austin, 2019

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This dissertation describes research which applies theory from the fields of communication and social psychology to create and test persuasive messages aimed at increasing public engagement with recycling. Recycling is a pro-environmental behavior which is often costly on front end but provides distal benefits. Although people often acknowledge the necessity of this behavior, they do not always follow through due to the uncertainty and ambiguity resulting from distal benefits. Accordingly, various persuasion tactics such as social norms have been utilized to motivate people to engage in socially desirable distal behavior, recycling. As an effort to increase the applicability of social norms in the context of pro-environmental behaviors, this dissertation proposed a new message design strategy, an emotional social norms message, by incorporating future-

oriented discrete emotions, in particular, anticipated pride, into a standard social norms message to demonstrate if emotions enhance norm-congruent behaviors. Specifically, the current study tested whether exposure to emotional descriptive norms messages (EDNMs), which contain both descriptive norms information and anticipated pride appeal, influences emotional, attitudinal, and behavioral outcomes relative to standard descriptive norms messages (SDNMs), which contain only descriptive norms information. Further, the current study examined the underlying mechanism and boundary condition of the emotional descriptive norms messages (EDNM) processing with anticipation of emotional outcome as a mediator and behavioral privacy as a moderator in the relationship between exposure to EDNMs and behavioral intentions. An online experiment was conducted using a 2 (anticipated pride: presence vs. absence) x 2 (order of presentation) x 2 (behavioral privacy: private vs. public) pre- and post-test between-subject design with a control group. The number of 280 participants, a nationally representative sample of the U.S., were recruited. The results showed that participants who viewed the EDNMs experienced greater anticipated pride than those who viewed the SDNMs. Further, anticipated pride mediated the effects of EDNMs on intention to recycle and intention to talk about recycling with their family such that EDNMs elicited greater anticipated pride, which led to greater intention to recycle and intention to talk compared to did SDNMs.

Keywords: social norms, descriptive norms, anticipated emotion, anticipated pride, behavioral privacy, recycling

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Chapter 1: Introduction

Nothing is as practical as a good theory.

(Lewin, 1943, 1945)

Some environment-related behaviors are costly on front end but provide later benefits. For example, to avoid using disposable cups and bags, people must carry reusable ones, which might be cumbersome. However, this behavior over time will be beneficial both for the natural environment and human beings by helping reduce waste and save resources. People already recognize the necessity of this behavior, but they do not always follow through (Desilver, 2016) due to the uncertainty and ambiguity resulting from distal benefits. People may be uncertain whether engaging in initially costly environment-related behaviors will actually bring about benefits to themselves or others later. In other words, people do not know when the benefits will come or how profitable they will be in comparison to the immediate cost. What can communication researchers and practitioners do to persuade people to engage in such behaviors?

When facing an uncertain and ambiguous situation, people tend to rely on social norms, this is: what the majority of people do (i.e., descriptive norm) and what they approve/disapprove of (i.e., injunctive norm), which facilitates decision-making. Accordingly, social norms campaigns have been widely used to promote health and environment-related behaviors or to discourage risky behaviors. These campaigns utilize normative messages indicating what the majority of people are doing and/or what people approve/disapprove of in order to correct people's misperceptions or directly influence their behaviors. Although prior literature has demonstrated the persuasive power of social norms messages on attitude or behavioral change in various contexts, the normative influence is not a universal panacea. As an effort to increase the applicability of social norms in the context of distal benefit behaviors, this dissertation

investigates the role of anticipated emotions in improving the persuasive power of standard social norms messages. Chang and Koban (2013) argue that researchers need to demonstrate that emotions motivate conformity to social norms. Accordingly, this dissertation proposes a new message design strategy, an *emotional social norms message,* by incorporating future-oriented discrete emotions, in particular, anticipated pride, into a standard social norms message to demonstrate if emotions enhance norm-congruent behaviors.

The present research uses a theoretical framework drawing from research on social norms and the role of discrete emotions in persuasion. The theoretical framework includes theories of social norms, as well as research on discrete emotions. Based on this framework, the present study contributes to the existing body of literature by incorporating future-oriented positive discrete emotion into social norms' messages and testing the relative persuasive effect of the emotional social norms' messages on anticipated emotion, attitude, and behavioral intentions compared to standard social norms' messages. The primary goal of this research is to answer the following questions, which remain unclear in the current body of work in this area:

- Does incorporating anticipated emotion into standard social norms messages (i.e., emotional social norms messages) enhance the relationship between the emotional social norms messages and distal benefit behavioral intentions in the context of recycling?
- If so, what is the underlying mechanism and boundary condition of the emotional social norms' messages processing?

To answer these questions, an online experiment was conducted to test the role of anticipated pride in emotional descriptive norm messages (EDNMs) in encouraging the following socially desirable distal benefit behavior: recycling. This behavior was selected for study based on their behavioral attributes of being initially costly but providing distal benefits.

Other examples of distal benefit behaviors include learning (education), voting, saving, safe sex, brushing teeth, exercising, healthy eating, using public transportation, etc. (Collins & Mullan, 2011; Sandberg & Conner, 2008).

In addition, this dissertation attempts to identify the underlying mechanism by which emotional descriptive norm messages (EDNMs) are processed by testing the mediating effect of anticipated emotion in the association between emotional descriptive norm messages (EDNMs) and behavioral intentions. Furthermore, this study seeks to specify a boundary condition in which the associations between emotional descriptive norm messages (EDNMs) and behavioral intentions are strengthened by testing the moderating effect of perceived behavioral attributes; one such example is behavioral privacy. Little research has examined the effect of perception of behavioral attributes in the social norms message–behavior relationship, which is an important factor in identifying the boundary conditions of the normative influence (Lapinski & Rimal, 2005; Lewis, 2013; Rimal, Lapinski, Turner, & Smith, 2011).

In the following chapters, I further examine the influences of emotional descriptive norm messages (EDNMs) in the context of recycling. Chapter two addresses theories on social norms and discrete emotions, focusing specifically on anticipated pride, as well as reviews prior literature utilized norms including social norms and anticipated emotion in the context of recycling. Chapter three presents research hypotheses to investigate these ideas further, while chapter four explains the methodological approach to the study. Chapter five details the analyses used in the current study following the results of the study in chapter six. Chapter seven explores the implications, and limitations of the research. Finally, chapter eight explores the conclusion of the research.

Chapter 2: Literature Review

The purpose of this chapter is to provide the theoretical foundation for understanding the effect of social norms and emotions on attitude and behavioral intentions. Drawing on theories of social norms and discrete emotion approaches, this chapter reviews two persuasive elements, social norms and emotions, in persuasion. This chapter first examines theories about social norms that serve as the cornerstone of this dissertation. Second, prior literature that has applied the social norms is delineated to further advance and extend its findings to emotional social norms message framing, in particular emotional descriptive norm message (EDNM). Third, the discrete emotion approaches in persuasion are examined as another theoretical framework to test the effect of emotional descriptive norm message (EDNM) on attitude and behavioral intentions. Fourth, previous literature that has used anticipated pride is outlined to understand the process and consequences of the emotional descriptive norm message (EDNM) and its effect on persuasion. Reviewing the prior literature reveals the role that social norms and emotions play in persuading people to adopt, initially costly, but distal benefits behaviors such as recycling.

THE ISSUE OF RECYCLING

Pro-social behaviors such as recycling require social movement on a collective level and produce collective-level outcome resulting from individuals' performance. Social normative influence has a greater impact on behaviors that benefit the collective through societal movement relative to the individual if all other things are the same (Lapinski, Rimal, DeVries, & Lee, 2007). Social norms are also effective when the behaviors or situations are characterized as uncertain, ambiguous, or novel since people depend on normative information when making decisions (Deutsch & Gerard, 1955; Goldstein, Cialdini, & Griskevicius, 2008; Griskevicius, Goldstein, Mortensen, Cialdini, & Kenrick, 2006; Kim, Kim, & Niederdeppe, 2015; Lapinski &

Rimal, 2005). Since the outcomes or benefits of recycling on the collective level are relatively distal, vague, and ambiguous rather than immediate, observable, and tangible, social norms would be an effective strategy to encourage recycling behavior.

Furthermore, social norms are more susceptible to behaviors that are beneficial for oneself as well as others (Rimal & Real, 2005). Since recycling could benefit both self and the collective, social norms messages could be useful to motivate such a socially desirable but distal benefits behavior. Lastly, as pro-social behaviors, such as recycling, are socially-desirable, valued, and positive behaviors, engagement in these behaviors is associated with positive emotions relative to negative emotions (Schneider, Zaval, Weber, & Markowitz, 2017). Thus, the current study applies descriptive social norm and anticipated pride into persuasive messages as a way to enhance public engagement with recycling.

THEORIES ABOUT SOCIAL NORMS

Social norms can be defined as social standards which influence behavior decisions and actions (Cialdini & Trost, 1998; Rimal & Real, 2003). These behavioral standards can be understood, created, maintained, and changed through various communication processes including interpersonal communication, mediated communication, or direct observation. Rimal and Real (2003) added the concept of *reference group* to the definition of social norms by conceptualizing social norms as the codes of conduct corresponding to one's reference group, which are communicated through various modes of social interaction.

According to research on social norms, social norms are often categorized into two distinct types, descriptive norms and injunctive norms, both of which inform and guide behaviors (Cialdini, Kallgren, & Reno, 1991; Cialdini, Reno, & Kallgren, 1990; Kallgren, Reno, & Cialdini, 2000). Descriptive norms refer to what the majority of people commonly do in a society

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while injunctive norms refer to that what people approve and disapprove of. A major difference between descriptive norms and injunctive norms is social sanctions. Only injunctive norms entail social sanctions for non-compliance with the norm (Cialdini & Goldstein, 2004; Cialdini et al., 1990; Deutsch & Gerard, 1955). In other words, descriptive norms encourage individuals to engage in a certain behavior by informing them of what is likely to be an efficient behavior in a society (i.e., informational influence, heuristic cues) whereas injunctive norms motivate behavioral changes via real or anticipated social reward or punishment (i.e., normative influence). Not only are the underlying motivations for two types of social norms different from each other, but also the underlying processes of two types of social norms are different from each other; descriptive norms aim to have public compliance more whereas injunctive norms seek private acceptance more (Cialdini & Goldstein, 2004; Kelman, 1958). Since these two types of norms have different effects, most scholars who seek to influence human behaviors use one or the other depending on their goals. In the following section, the theories of social norms distinguishing the roles of descriptive norms and injunctive norms were addressed.

Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB), and Integrative Model of Behavioral Prediction (IMBP)

In social science, three theoretical frameworks have been widely applied in research on normative influence. These theories explicitly include the concept of norms as the motivators of human action and inaction. First, the theory of reasoned action (TRA) (Ajzen & Fishbein, 1970; Fishbein & Ajzen, 2011) and theory of planned behavior (TRB) (Ajzen, 1985, 1991) explicate the effect of subjective norms on behavioral intention and actual behavior in addition to attitude and perceived behavioral control (PBC). Prior literature states that the concept of subjective norms is compatible with the injunctive norms (Ajzen, 2002). Both TRA and TPB assume that

individuals systematically use and evaluate available information about outcomes of volitional

behaviors before performing the behaviors. Also, those volitional behaviors can be best predicted

from a person's willingness or behavioral intention, which is defined as "a measure of the

likelihood that a person will engage in a given behavior (p.41)" (Ajzen & Fishbein, 1980).

Although prior research on TPB has mainly used in predicting planned and premeditated

behaviors as postulated, some researchers indicated the utility of TPB in habitual behaviors

involving automatic processes such as travel mode choices (Aarts, Verplanken, & Van

Knippenberg, 1998; Bamberg, Ajzen, & Schmidt, 2003).

According to TRA, a person's behavioral intention can be predicted from one's attitude

toward the behavior and subjective norms. Within the TRA framework, attitude toward a

behavior is regarded as the extent to which a person evaluates a certain behavior favorably or

unfavorably (Ajzen, 1991). Subjective norms refer to a person's perceived social pressure from

important others about whether one should carry out the behavior or not (Ajzen, 1991). Both

attitude and subjective norms contain a belief and evaluative component. Specifically, attitudes

will be determined by the degree to which an individual believes that performing a behavior will

produce a certain outcome (i.e., behavioral beliefs) and by the extent to which the potential

behavioral outcomes are important (i.e., outcome evaluation). Subjective norms will be

determined by not only an individual's perceived behavioral expectation from her/his important

people such as family, friends, or a spouse, but also someone's motivation to comply which

refers to the degree to which an individual is willing to perform a behavior based on the

perceived norms.

Later, TPB added a component, perceived behavioral control (PBC), to predict a person's

behavioral intention. PBC refers to one's levels of control (i.e., control beliefs and control

power) the individuals perceive themselves to have over performance of the behavior, which has a direct impact on a behavior. TPB hypothesizes that positive attitudes toward a behavior, greater perceived subjective norms, and high levels of PBC would lead to a strong intention to perform the behavior through cognitive evaluation.

Consequently, the intention to carry out the behavior is the strongest predictor of the actual behavior. Both TRA and TPB has been widely applied to various research topics including pro-social as well as risky behaviors (Andrews, Silk, & Eneli, 2010; Armitage & Conner, 1999; Della, DeJoy, & Lance, 2008), binge drinking (Park, Klein, Smith, & Martell, 2009), recycling (Terry, Hogg, & White, 1999), organ donation (Bresnahan et al., 2007; Park, Smith, & Yun, 2009), and distracted driving and walking (Koh & Mackert, 2016; Koh, Oh, & Mackert, 2017; Nemme & White, 2010; Walsh, White, Hyde, & Watson, 2008; Zhou, Wu, Rau, & Zhang, 2009).

Although prior studies have demonstrated the efficacy of TRA and TPB to explain and predict one's behavior, the findings from prior studies have also shown the mixed results about the predictive power of subjective norms on behavioral intention. Previous research suggested that subjective norms in TPB might not capture the normative beliefs well enough and thus it might improve the explanatory and predictive power of TPB by adding more normative components such as group norms, moral/personal norms, or descriptive norms (Conner & Armitage, 1998; Norman, Clark, & Walker, 2005; Parker, West, Stradling, & Manstead, 1995; Rivis, Sheeran, & Armitage, 2009).

Ajzen (2002) said that the concept and measure of subjective norms are compatible with the injunctive norms, however, he recommends that the measure of subjective norms include items for descriptive norms. This is because participants' responses which are measured by the

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original subjective norms scale do not have enough variability to predict behavior intention. Prior literature supports the benefits of adding descriptive norms into TPB; a meta-analysis conducted by Rivis and Sheeran (2003) indicated the relatively strong association between descriptive norms and intention. Furthermore, the inclusion of descriptive norms in TPB increased the amount of explained variance in behavioral intention. The integrative model of behavioral prediction (IMBP), the most recent iteration of the TRA/TPB, incorporates both descriptive norms and injunctive norms, which directly influences behavioral intention (Fishbein, 2009). In the IMBP, the effect of perceived descriptive and injunctive norms on behavioral intention depends on the behavior and population in question (Dai, Wombacher, Matig, & Harrington, 2018). The IMBP also added Bandura's concept of self-efficacy in addition to Ajzen's recent construct of PBC (Montano & Kasprzyk, 2015).

Although Ajzen (2002) asserts that subjective norms are compatible with injunctive norms, other literature supports differentiation of these two norms by indicating subjective norms and injunctive norms were distinct constructs (Lee & Paek, 2014; Park, Klein, et al., 2009; Park & Smith, 2007). Park and Smith (2007) found that subjective norms, descriptive norms, and injunctive norms are distinctive of each other; they described that "pressure from one's reference group (i.e., subjective norms) can be differentiated from approval/disapproval (i.e., injunctive norms) and popularity (i.e., descriptive norms), and these norms are further separated to personal and societal level" (Park & Smith, 2007 p. 198).

In terms of pro-social behaviors, two social norms theories have been widely utilized to lead to behavioral changes: focus theory of normative conduct (FTNC) and theory of normative social behavior (TNSB). Both theories distinguish the role of descriptive norms from the role of

injunctive norms in explicating how social norms affect behavior. In particular, these two theories posit different roles of injunctive norms in persuasion.

Focus Theory of Normative Conduct (FTNC) and Theory of Normative Social Behavior (TNSB)

Scholars in social science have used social norms in shaping, changing, and reinforcing human behavior. However, their findings have indicated mixed support for the efficacy of social norms especially when the two distinct social norms were not differentiated (Cialdini et al., 1991; Cialdini et al., 1990). Cialdini (2011) states that the components of descriptive norms and injunctive norms in a message should work in a different way because of the distinct motivational mechanism of each norm. Particularly, descriptive norms are related to intrapersonal goals (e.g., making accurate/efficient decisions) which can be achieved by applying the heuristic rule 'most others do it so I will too', through observing others' behaviors (Cialdini & Trost, 1998). On the other hand, injunctive norms are more closely associated with interpersonal goals (e.g., gaining/maintaining social approval) which demands an understanding of the culture's moral rules, that is, what others tend to approve or disapprove of (Goldstein & Cialdini, 2011). The two theories agree that people tend to comply with the norms when both descriptive norms and injunctive norms align with each other (Rimal & Lapinski, 2015; Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007). Although the underlying motivations of two types of social norms are similarly posited in both theories, there are differences in the role of injunctive norms between two theories. FTNC posits the independent role of injunctive norms in affecting behavior whereas TNSB posits that injunctive norms may not be enough to affect behavior by themselves positing its roles as a moderator (Rimal & Real, 2005) or a mediator (Rimal, 2008) in the relationship between descriptive norms and behaviors.

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The focus theory of normative conduct (FTNC) proposes that descriptive norms and injunctive norms influence one's action and inaction (Cialdini, 2011). Cialdini (2003) argues that communication strategies that activate social norms can be used to motivate socially beneficial conduct. For example, Goldstein et al. (2008)'s study (experiment 1) showed that it is effective to use a social norms message indicating the prevalence of a desirable behavior, towel reuse, to encourage people to reuse towel in hotels in comparison with the use of a persuasive message with an argument with only the importance of environmental protection. The results indicated the persuasive power of the descriptive norms message such that people who viewed the descriptive norms message significantly reused towels more than those who viewed the persuasive message without normative information. That is, informing people of the fact that what the majority is doing promotes an intended desirable behavior.

Also, FTNC addresses the salience of norms effect, which explains why normative influence occurs. When descriptive norms or injunctive norms are salient, normative influence is more likely to occur and people will engage in norm-congruent behavior (Cialdini, 2011; Cialdini et al., 1991; Goldstein & Cialdini, 2011; Kallgren et al., 2000). That is to say, salient norms are those which are focal to people in a conscious manner. Enhancing salience occurs through highlighting normative information in a persuasive message or making people focus on the norms existing in a group or society. Salience of norms effect can also occur when an individual views a message including normative information relative to the same message without normative information (Goldstein & Cialdini, 2011; Jacobson, Mortensen, & Cialdini, 2011; Kallgren et al., 2000). According to FTNC, salient norms can activate behavior, whereas non-salient or less salient norms cannot. People should be more likely to perform norm-

congruent behaviors when the norm within a message is prominently emphasized (Cialdini & Goldstein, 2004).

Regarding the role of injunctive norms in behavioral change, Reno, Cialdini, and Kallgren (1993) examined the effect of salient injunctive norms on littering behavior in a field experiment. Reno et al. (1993) observed whether people litter or not when they were focal to anti-littering injunctive norms in either a clean or littered environment. They manipulated the salient anti-littering injunctive norms by getting a confederate pick up a piece of litter; in a control condition, a confederate just walked by without picking it up. That is to say, a subject's attention is focused on the anti-littering injunctive norms, the confederate's littering behavior. Also, the descriptive norms, the popularity of littering, were manipulated by making the environment clean or dirty. The clean environment represents that littering is not a prevalent behavior while the dirty environment represents that littering is a prevalent behavior in the situation. Their findings indicated that salient injunctive norms were influential in reducing littering regardless of the environment's status (regardless of the prevalence), even when the negative descriptive norms (i.e., a dirty environment) exist. This finding implies that the effect of injunctive norms on behavioral change transcends when the norms were temporarily prominent in consciousness. The FTNC has been widely used in various contexts including littering (Cialdini et al., 1991; Reno et al., 1993), recycling (Cialdini et al., 1990; White & Simpson, 2013), energy conservation (Schultz et al., 2007), and towel reuse in a hotel (Goldstein et al., 2008; Schultz, Khazian, & Zaleski, 2008). Unlike the FTNC, the TNSB proposed the injunctive norms as a moderator (or as a mediator) in the relationship descriptive norm – behavior (Rimal, 2008; Rimal & Real, 2003; Rimal & Real, 2005).

Rimal and Real (2005) proposed and tested the theory of normative social behavior (TNSB). The TNSB describes and predicts the effect of individuals' perception of popularity or prevalence (i.e., descriptive norms) on behaviors by explicating the boundary conditions. That is to say, the TNSB proposes that perceptions of prevalence motivates one to perform norm-congruent behavior. Furthermore, the TNSB postulates that the association between perceived descriptive norms – behaviors is moderated by injunctive norms, outcome expectations, group identity, and ego-involvement (Lapinski & Rimal, 2005; Rimal & Real, 2005).

Injunctive norms are related to people's belief that what they ought to do based on social approval or disapproval. Violating injunctive norms leads to social sanctions or punishment whereas conforming to injunctive norms is rewarding (Lapinski & Rimal, 2005; Rimal & Real, 2003). Outcome expectation refers to the estimated costs or benefits of engaging in the behavior (Lapinski & Rimal, 2005; Rimal & Real, 2005). Outcome expectations include three dimensions: anticipatory socialization, benefits to self, and benefits to others (Rimal & Real, 2005). Anticipatory socialization is the expected outcome that participating in a behavior will help ease one's socialization with other group members in a social group. Benefits to self and others are defined as beliefs that performing a certain behavior is beneficial for her/himself or others (Lapinski & Rimal, 2005). Lastly, group identity refers to the perception of a similarity and difference between oneself and other people in a reference group as well as the desire to emulate the referent people (Rimal & Real, 2003).

The tenet of TNSB is the relationship between perceived descriptive norms and behavior becomes stronger as the effect of underling cognitive moderators including injunctive norms, outcome expectations, and group identity gets stronger. In other words, perceived descriptive norms will drive people to perform the prevalent behavior, particularly when they feel pressure

to participate in that behavior, when they think engaging in that behavior is beneficial for themselves and/or others, when they expect benefits from the increased socialization, and when they see similarity in other group members and desire to imitate them.

TNSB has been used in some way in a variety of contexts including alcohol consumption (Carcioppolo & Jensen, 2012; Jang, Rimal, & Cho, 2013a; Jang, Rimal, & Cho, 2013b; Lapinski, Zhuang, Koh, & Shi, 2015; Mollen, Rimal, Ruiter, Jang, & Kok, 2013; Padon, Rimal, Jernigan, Siegel, & Dejong, 2016; Rimal, 2008; Rimal & Mollen, 2013; Rimal & Real, 2005; Yang, 2018), bystander intervention for sexual assault (Mabry & Turner, 2016), health-related issues (Kim et al., 2015; Rimal, Lapinski, Cook, & Real, 2005; Yun & Silk, 2011), hand washing (Chung & Lapinski, 2018; Lapinski, Anderson, Shugart, & Todd, 2014; Lapinski, Maloney, Braz, & Shulman, 2013), indoor tanning (Carcioppolo, Orrego Dunleavy, & Myrick, 2018; Carcioppolo, Orrego Dunleavy, & Yang, 2017), smoking (Bresnahan & Zhuang, 2016; Nan & Zhao, 2016), recycling (Lapinski et al., 2015), voting (Glynn, Huge, & Lunney, 2009), and water conservation (Lapinski et al., 2007). The majority of studies using the TNSB have involved health-related issues except for few studies about voting and water conservation, and have consistently found that the direct and indirect effects of descriptive norms information on perceptions, attitudes, or behavioral outcomes.

Many TNSB studies have explored additional moderators in the relationship between perceived descriptive norms and behaviors (Rimal & Lapinski, 2015), including involvement (Lapinski et al., 2015), group orientation (Lapinski et al., 2007), self-identity (Rimal, 2008; Yun & Silk, 2011), self-monitoring (Jang, 2012) and self-efficacy (Jang et al., 2013b) focusing on the psychological factors in an individual level as moderators. Furthermore, Chung and Rimal (2016) have revised the TNSB and proposed a consolidated framework by organizing and

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categorizing moderating attributes into behavioral, individual, and contextual factors. In other words, Chung and Rimal (2016) have delineated when, how, and why perceptions of descriptive norms affect behavioral components by proposing and refining moderators.

Recently, researchers have investigated other factors beyond the individuals' psychological-level moderators based on an attribute-centered approach such as behavioral privacy (i.e. observability) (Chung & Lapinski, 2018; Lapinski et al., 2013; Lapinski & Rimal, 2005; Lewis, 2013). According to the attribute-centered approach (Lapinski & Rimal, 2005; Rimal & Lapinski, 2015), when taking into account the role of behavioral attributes that represent the behavior, the relationship between social norms-behavior could be better appreciated and the model would have greater precision.

Rimal et al. (2011) proposed the attribute-centered approach, which helps researchers better understand the properties of a given behavior and encourage them to take into account behavioral attributes to influence behavioral outcomes. One of the behavioral attributes that are closely related to social norms is behavioral privacy. When it comes to an observable and public behavior, normative influence is expected to become stronger than non-observable and private behavior since people do not recognize what other people do.

Privacy and publicness are placed on the opposite side of a behavioral attribute continuum. Normative influence gets stronger when a behavior is characterized by publicness or observability. In other words, with the presence of others, the relationship between perceived descriptive norms and behavior becomes stronger, compared to context marked by the absence of others. However, findings from prior studies are mixed such that the role of behavioral privacy would be dependent on the types of social norms. For instance, the presence of others did not enhance the effects of descriptive norms on a behavior regarding hand-washing in a field

experiment (Lapinski et al., 2013). However, the observability of an enactment by others enhanced the influence of injunctive norms on behaviors in sun protection and nutrition behaviors in online experiments (Lewis, 2013).

The following section details prior literature testing the effect of social norms messages on behaviors including the environment-related contexts. Reviewing prior empirical research about the effect of social norms messages on various outcomes including perceptions and behavioral intentions addresses the gap in knowledge about social norms messages in the fields of communication.

Social Norms Messages in Persuasion

Although there are two distinct types of social norms, prior research has mainly used descriptive norms messages to explore how the prevalence of information influences peoples' perceptions, attitudes, and behaviors in environment-related behaviors (Goldstein et al., 2008; Lapinski et al., 2007; Reese, Loew, & Steffgen, 2014; Shang, Basil, & Wymer, 2010; Terrier & Marfaing, 2015) and health-related contexts (Lapinski et al., 2013; Rimal et al., 2005). For example, a study tested the persuasive impact of descriptive norms messages on changing perceived norms and behaviors in the hand-washing context among college males (Lapinski et al., 2013). In a lab experiment (Study 1), they tested whether descriptive norms messages could affect peoples' perceptions of prevalence such that people who viewed a high-prevalence norms message perceived a greater prevalence of hand-washing behavior among college men than those who viewed a low-prevalence norms message. Their findings indicated that normative messages' content is influential in changing individuals' descriptive normative perceptions.

In addition, in a field experiment (Study 2), Lapinski et al. (2013) also tested whether the descriptive norms messages influence hand-washing attitudes and behavior in men's public

restrooms. They found that college men in the high prevalence message condition reported more positive attitudes toward hand washing and were more likely to wash their hands after using the bathroom than those in the low-prevalence and control message condition. Their findings indicated that people in the high prevalence condition reported more positive attitudes toward hand-washing than those in the control condition while there was no difference in hand-washing attitudes between the high and low prevalence conditions. In terms of the actual hand-washing behavior, people in the descriptive norms conditions (both in high and low prevalence conditions) were more likely to wash their hands after using the bathroom than those in the control condition. Findings from Lapinski et al. (2013)'s study demonstrated the persuasive power of descriptive norms messages in changing perceptions of prevalence and motivating people to adapt a safe and healthy behavior.

Descriptive norms messages have been also utilized to promote pro-environmental behaviors. For example, Goldstein et al. (2008) (experiment 1) explored the effect of a descriptive norms message on encouraging consumers to reuse towels in hotels. In their field experiment, they created two signs. Both signs identically described the hotel's towel reuse program and its significance in environmental protection. The only difference between the two signs was the normative information part: one included descriptive normative information showing the high prevalence of towel reuse in the hotel while the other did not include any normative information. The results showed that people who were exposed to a message including the high descriptive normative information (44%) reused towels more than those who were exposed to a persuasive environment protection message (35%). In other words, these findings imply that informing people of what the majority is doing (i.e. descriptive norms information) could leverage socially desirable behaviors.

Researchers have investigated and compared the independent effect of descriptive and injunctive norms messages not only to persuade people to participate in socially desirable behavior but also to dissuade people from the enactment of socially undesirable behavior. For example, Cialdini et al. (2006) conducted a field experiment in which they tested the interaction effect of the type of normative information (injunctive vs. descriptive) and normative focus (negatively worded vs. positively worded) on decreasing wood theft in a park. They hypothesized that the negatively worded injunctive norms message (i.e., not to remove petrified wood from the park) would be more persuasive in reducing wood theft than the positively worded descriptive norms (i.e., many previous visitors have damaged the environment). Being consistent with the hypothesized direction, their findings indicated that the positively worded descriptive norms message showing the prevalence of wood stealing caused a boomerang effect. That is to say, when a descriptive norms message shows that many people engage in an undesirable behavior, the message backfires. One way to eliminate undermining descriptive norms messages is to include both descriptive and injunctive normative information in a message Schultz et al. (2007) tested the combined effect of descriptive and injunctive normative information in a message to promote household energy conservation. They manipulated descriptive norms in a message, which indicated the average neighborhood's energy use. The descriptive normative message was successful in reducing the energy consumption among people who consumed above the average, but it yielded an undesirable boomerang effect among those who consumed below the average. To eliminate the boomerang effect, they added injunctive normative information in the descriptive norms message. Regarding the injunctive norms manipulation, to show the approval of energy conservation, they used a smiley face (i.e., ☺) when a household consumed energy below the average. On the other hand, to show

disapproval for over-consumption, they used a sad face (i.e., ☹) when a household consumed energy above the average. The observed boomerang effect among those who consumed below the average was eliminated when an injunctive normative content was added to the descriptive normative message. These findings from Cialdini et al. (2006) and Schultz et al. (2007) imply the transcended persuasive power of injunctive norms to change individuals' behaviors. Other researchers have explored when and why a descriptive norms message and/or an injunctive norms message are more influential considering individual psychological factors such as regulatory fit (Melnyk, van Herpen, Fischer, & van Trijp, 2013), and individual-collective level self-activation (White & Simpson, 2013) as moderators. For example, White and Simpson (2013) examined the effect of normative appeals (descriptive, injunctive, and self-benefit) and self-identity (i.e., individual-level and collective-level self) on consumers' environmentally-friendly behaviors such as glass-recycling and composting. These behaviors were chosen since these two environmental behaviors are relatively unfamiliar to people. In their series of experiments, they explored the boundary conditions in which descriptive norms appeals, injunctive norms appeals, and self-benefit appeals were superior to one another based on the goal-compatible mechanism. Findings indicated that when the collective level of self is activated, descriptive and injunctive norm appeals yielded more positive intentions and behaviors than benefit appeals and control whereas when the individual level of self is activated, benefit appeal and descriptive norm appeals produced more positive intentions and behaviors than injunctive appeals and control (i.e., information only and no message). In other words, descriptive norm appeal was effective regardless of the which self is activated.

In addition, White and Simpson (2013) explored the underlying mechanism as to why a certain type of social norms message was superior to another under the individual vs. collective

level self-activation condition based on the goal-compatibility mechanism. According to Cialdini and colleagues (1990; 1991), descriptive norms act as a heuristic decision shortcut and has an informational value whereas injunctive norms are value-laden beliefs which are associated with social approval/disapproval. Consequently, when people's individual level self is activated, people were less likely to be affected by injunctive norms messages since their autonomy was threatened. Furthermore, descriptive norms messages were effective when individual level self is activated only when the activity is ambiguous (vs. unambiguous). This is because the descriptive norms messages had an additional informational value under an ambiguous condition where individuals need such information to choose an appropriate behavior. Melnyk et al. (2013) also explored the moderating effect of regulatory focus (promotion vs. prevention) in the effect of descriptive norms messages and injunctive norms messages on consumers' organic and fair trade product consumption. Their results indicated that descriptive norms messages were more effective under promotion-focused compared to under prevention-focused while injunctive norms messages were not affected by the regulatory focus. The results may imply the transsituational effect of injunctive norms in promoting socially desirable behaviors.

Summary and Implications

To sum up, social norms messages have been widely used to persuade people to engage in environmentally-friendly behaviors as well as dissuade them from engaging in unhealthy and harmful behaviors (Borsari & Carey, 2003; Mollen, Rimal, & Lapinski, 2010). In particular, many prior studies have utilized and demonstrated the persuasive power of descriptive norms messages on changing perception of prevalence and generating positive behavioral outcomes. However, one should be conscious of the unintended effect of descriptive norms messages a) when the message depicts the prevalent undesirable behaviors (Cialdini et al., 2006) or b) when

the viewers already outperformed what the message says (Schultz et al., 2007). One of remedies for this undesirable effect was to add injunctive normative information in the descriptive norms message (Schultz et al., 2007). In Schultz et al.'s study (2007), injunctive normative information functions as a reward or punishment by conveying social approval or disapproval. That is, the combined effect of descriptive norms information and injunctive norms information in a persuasive message complement one another, which motivates norm-congruent behavior.

In line with it, this dissertation tries to make standard descriptive norms message more persuasive by incorporating an emotional appeal into the standard descriptive norms message, which is called *emotional descriptive norms message* (EDNM). It is expected that anticipate positive emotion such as anticipated pride could be regarded as a reward or incentive (Baumgartner, Pieters, & Bagozzi, 2008). Specifically, by combining descriptive norms information and anticipated pride appeal in a message, this dissertation focuses on examining the effect of emotional descriptive norms message (EDNM) relative to standard descriptive norms message (SDNM). The added emotional appeal into the standard descriptive norms message (SDNM) could serve as a reward (e.g., anticipate pride as perceived social approval) or punishment (e.g., anticipated guilt as punishment via self-blaming), which helps motivating individuals to conduct the norm-congruent behavior. Consequently, this dissertation tests the effects of emotional descriptive norms messages (EDNMs) on attitudes and behavioral intentions compared to those of standard descriptive norms messages (SDNMs) in the contexts of recycling. In the following section, two general approaches to study emotions in the field of communication are discussed and then a future-oriented positive discrete emotion, *anticipated pride,* is detailed as a strategic way to make standard descriptive norms messages (SDNM) more persuasive.

EMOTIONS

Emotions, a psychological construct, are defined as "internal mental states representing evaluative valenced reactions to events, agents, or objects that vary in intensity (*p*. 10)" (Nabi, 2010). Researchers have increased the depth and breadth of research related to emotion and, in so doing, have produced several distinct approaches to studying the roles of emotions in persuasion. In the following section, the two dominant approaches of emotion research in the field of communication are discussed.

Dimensional and Discrete Approach to Research on Emotion

In the field of communication, two different approaches to studying emotion are dimensional (valence) and discrete perspectives (Bolls, 2010; Nabi, 2010; Nabi & Wirth, 2008). Both approaches commonly posit a significant role of emotions in persuasion.

The dimensional approach of emotions emerges from basic motivational processes, such as appetitive or aversive motivational subsystems. Through such processes, the spectrum of emotion can range from an unpleasant response to a pleasant response with different levels of arousal (Bolls, 2010; Cacioppo & Gardner, 1999). That is to say, in the model of dimensional emotions, different emotions are measured along several continuums, such as the level of intensity of arousal from low to high, or a spectrum of the valence of emotions from negative to positive. The effect of emotions on attitude, intention, and/or behavioral change mainly depends on the intensity and valence of the aroused emotion.

However, several studies state that a discrete emotional perspective, rather than the dimensional approach, enables researchers to better understand the role of emotions in the persuasion process because the discrete emotion perspective specifies differences in effects and pathways (i.e., activation and consequences) between different discrete emotions and allows

prediction of how people respond to each distinct emotion (Chadwick, 2015; Conner & Armitage, 1998; Dillard & Peck, 2001; Nabi, 2010). The dimensional approach, however, is simply based on valence by treating different emotions that share the same valence, such as guilt and shame, as homogeneous in terms of their activation, pathways, and consequences (Dillard & Nabi, 2006; Dillard & Peck, 2000; Dillard & Peck, 2001; Dillard, Plotnick, Godbold, Freimuth, & Edgar, 1996; Lerner & Keltner, 2000, 2001; Nabi, 1999, 2010; Nabi, Dillard, & Pfau, 2002).

According to theories of discrete emotion, emotions can be divided into discrete categories. Several theories about discrete emotions (e.g. appraisal theory) posit that each emotion has a distinct pathway, which includes its antecedents, processes, and resulting consequences (Izard, 2007, 2009; Lazarus, 1991; Lazarus, 2001; Roseman, 2001; Roseman & Smith, 2001; Smith & Ellsworth, 1985). The central proposition of appraisal theory is that "emotions are elicited and differentiated on the basis of a person's subjective evaluation or appraisal of the personal significance of a situation, object, or event on a number of dimensions or criteria" (Scherer, 1999). That is to say, each discrete emotion emerges from one's subjective appraisal of the relationship between one's goal and the environment (Lazarus, 1991; Nabi, 1999). Each emotion has a distinctive goal and corresponding action tendency that serve adaptive functions, which in turn can influence attitudes, intention, and/or behavior. Perceived incompatibility between the goal and environment generates negative emotional states while the perception of goal-environment compatibility yields positive emotions (Dillard & Nabi, 2006; Lazarus, 1991; Nabi et al., 2002). Also, such appraisals could result in the anticipation of discrete emotions (Frijda, 1993), which is called anticipated emotion (Bagozzi, Wong, Abe, & Bergami, 2000; Baumgartner et al., 2008).

Scholars have actively theorized about the effect of negative emotions in persuasion (e.g., Nabi's Cognitive Functional Model, 1999 & Witte's Extended Parallel Process Model, 1992). However, efforts to develop theories of positive emotions have recently begun to receive attention (e.g., Chadwick's Theory of Persuasive Hope, 2015). According to theories of positive emotion, positive emotions have been shown to be the result of compatibility between one's goal and environment (Dillard & Nabi, 2006; Dillard & Peck, 2001; Lazarus, 1991; Nabi, 2010; Shaver, Schwartz, Kirson, & O'Connor, 1987). However, similar to negative emotions, the process of identifying discrete positive emotions can be complicated. For example, Shaver et al. (1987) categorized emotions into six basic categories (i.e., love, joy, anger, sadness, fear, and surprise) and investigated the hierarchical structures of these basic emotions. Their analysis indicated that joy was a higher-order concept encompassing sub-categories such as pride. According to their findings, people who succeeded in their tasks and had a sense of achievement, felt joy or pride (Shaver et al., 1987).

Based on the positive discrete emotion approach, researchers have examined the association between positive emotions including, warmth appeals (Aaker, Stayman, & Hagerty, 1986; Huang, 1998), humor (Nabi, 2016; Skurka, Niederdeppe, Romero-Canyas, & Acup, 2018), pride (Bissing-Olson, Fielding, & Iyer, 2016; Griskevicius, Shiota, & Neufeld, 2010), hope (Chadwick, 2015), enthusiasm (Ladd & Lenz, 2011), happiness (Quick, Kam, Morgan, Montero Liberona, & Smith, 2015), and contentment (Griskevicius, Shiota, & Nowlis, 2010; Puccinelli, Wilcox, & Grewal, 2015) and persuasion. For example, Quick et al. (2015) explored the mediating effects of guilt and happiness in the relationship between gain- and loss- framing and psychological reactance, which influences organ donation attitude. They found that loss-framed radio ads were related to heightened guilt appraisal, which led to an increased threat to one's

perception of freedom and then increased psychological reactance. Furthermore, the increased perceived freedom threat was negatively associated with one's attitude toward organ donation.

In the Quick et al. study (2015), the happiness appraisal did not significantly predict the association between gain-framed messages and psychological reactance process and attitude. However, the direction of the relationship was consistent with the prediction. In other words, gain-framed messages were related to feelings of happiness, which were less likely to be involved in the physiological reactance process. Their findings call for efforts to incorporate discrete emotions into research on persuasion in order to explicate the underlying mechanisms.

In the study of persuasion, the theories of discrete emotions could help in designing social norms messages and understanding the influence of social norms on behavioral changes. Based on the distinct pathways of each discrete emotion, this dissertation focuses on a discrete emotion, anticipated pride, with the goal of developing an emotional descriptive norms message (EDNM). This dissertation discusses the unique pathways of anticipated pride as future-oriented positive discrete emotions and then explores how this emotion has been used in persuasion research. Within social science, researchers have examined the persuasive impact of emotional appeals in promoting a healthy and sustainable lifestyle. It is expected that anticipated pride appeal in a standard descriptive norms message (SDNM) serves as driving force by indicating an expected reward and thus encouraging others to change or continue their current course of action in a desirable way (e.g., adopting a popular behavior recommend in the message).

Anticipated Pride

This section provides the definition of anticipated pride as a discrete emotion and explains the nature of anticipated pride. Furthermore, this section reviews prior literature applying anticipated pride as a discrete emotion in the field of communication in order to

understand how emotional descriptive norms messages (EDNMs) with anticipated pride influence attitudes and behavioral intentions.

Pride is a positive discrete emotion, which is derived from one's self-evaluations after conforming to personally or socially important standards (Lewis, 1997; Tangney, 1999; Tracy & Robins, 2004a, 2004b). Thus, if one believes that s/he has done something that is moral and valued, they are likely to experience pride based on his/her behavior. Johnson-Laird and Oatley (1989) define pride as "happiness with self as a result of a high opinion of self in relation to others" (p. 118). That is to say, when people perceive that they are superior to others, they may also experience this positive feeling of pride of themselves (Tesser & Collins, 1988). However, from a discrete emotion approach, pride is different from other positive emotions, including happiness. Lazarus (1991) defined happiness as a discrete emotion people experience when they make reasonable progress toward their goals and when they expect positive outcomes. Pride was conceptualized as a discrete emotion people experience when they confirm or enhance their ego-identity by taking credit for an achievement for themselves or social groups with which they identify (Lazarus, 1991). According to Lazarus' conceptualization of pride (1991), prideful feelings could be evoked by vicarious experiences, such as the achievement of one's significant others such as family members. In other words, critical differences between happiness and pride are whether or not the causal event enhances personal worth (i.e., self- and social-esteem) and whether or not the appraisal process involves the role of significant other people to take credit for the attainment of goals. Fishbach, Eyal, and Finkelstein (2010) also state that the effects of happiness and pride on individuals' self-control are distinct. Pride is related to long-term goals while happiness is related to short-term goals; when people are exposed to pride-related words or write about a future event evoking pride, they exert more self-control, compared to when those

are exposed to happiness-related words or write about a future event eliciting happiness. In other words, pride may be anticipated when one persist a task and keep performing it while resisting temptation. However, both happiness and pride encourage individuals to continue to take a goal-oriented action to maintain/reproduce the positive emotional state (Dillard et al., 1996; Lewis, 2000).

Proud individuals tend to have the urges to publicly express their feelings of pride by showing off and pointing the source of pride. (Lazarus, 1991), According to Tracy and Robins (2004b, 2007b), the expression of pride includes both facial and bodily components including small smile, expanded posture, tilted head, hands on the hips or arms raised above the head. Prior research showed that this prototypical expression of pride is commonly recognized by people across different cultures including adults as well as children. This expression is distinguished from other positive emotions such as happiness (Tracy & Robins, 2004b, 2007b; Tracy, Robins, & Lagattuta, 2005). However, one should cautious about interpreting these findings such that the facial and bodily expression of pride might not universal and might be culturally specific since pride is a social emotion which reflects unique social and cultural contexts. Prior literature also found that there were cultural differences in experiencing and expressing emotions between people from individualistic cultures and those from collectivistic cultures as well as in the effect of an emotion on human's well-being (Curhan et al., 2014; Davis et al., 2012; Eid & Diener, 2001; Kim, 2016; Oyserman, Coon, & Kemmelmeier, 2002).

Mascolo and Fischer (1995) also define pride as a positive discrete emotion "generated by appraisals that one is responsible for a socially valued outcome or for being a socially valued person" (p. 66). In this sense, pride is a social emotion that stimulates the achievement of complex social goals, such as maintaining and enhancing one's status or avoiding rejection from

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one's social group (Tracy & Robins, 2004b; Tracy, Robins, & Tangney, 2007). That is, pride is an impetus for people to work hard to attain these goals (Stipek, 1995; Weiner, 1985), to act in socially appropriate ways, and to behave responsibly in the future (Bodolica & Spraggon, 2011; Cheng, Tracy, & Henrich, 2010). Also, when people experience pride, they are evaluating themselves based on the views of other people and, thus, perceiving themselves as socially respected and valuable according to these views.

Theories of pride have mainly been developed in the field of developmental psychology (Tangney, 1999), but they have also recently been applied to other disciplines, such as consumer psychology (Antonetti & Maklan, 2014a, 2014b; Onwezen, Bartels, & Antonides, 2014b) and environmental psychology (Harth, Leach, & Kessler, 2013; Onwezen, Antonides, & Bartels, 2013; Onwezen, Bartels, & Antonides, 2014a). According to prior literature (Lewis, 2000; Tangney, 1999; Tracy & Robins, 2004a, 2004b, 2007b; Tracy et al., 2007), there are two primary types of pride. The first type is event-specific and achievement-oriented; it is formed based on evaluations of specific behavior and achievements that can be attributed to one's efforts or abilities (Tangney, 1999; Tracy & Robins, 2007b). It is referred to as *authentic pride* (Tracy & Robins, 2007b), *beta pride* (Tangney, 1999), or *pride* (Lewis, 2000). The second type of pride is experienced in reference to one's self; it is formed based on a person's evaluations of his or her total self and may, therefore, lead to negative social consequences (Lewis, 1997; Tangney, 1999). This type of pride is called *hubristic pride* (Tracy & Robins, 2007b)*, alpha pride* (Tangney, 1999), or *hubris* (Lewis, 2000). People experience authentic pride rather than hubristic pride when they behave in accordance with socially valued goals and socially approved enactment (Williams & DeSteno, 2008), including activities like making donations, volunteering, or supporting cause-related marketing campaigns (Boezeman & Ellemers, 2007; Kim & Johnson,

2013). Similarly, authentic pride rather than hubristic pride is developed in the context of altruistic and pro-environmental behaviors, such as recycling, since authentic pride is elicited when people evaluate a specific behavior rather than the entire self. These characteristics and functions of pride as a discrete positive emotion are applied to those of anticipated pride.

People often anticipate how their choices (i.e., action or inaction) will make them feel. Studying anticipated emotions are important because they influence individuals' decision-making and shape their behaviors (Baumeister, Vohs, Nathan DeWall, & Zhang, 2007; Baumgartner et al., 2008; DeWall, Baumeister, Chester, & Bushman, 2016; Katzir, Eyal, Meiran, & Kessler, 2010; Mellers & McGraw, 2001; Patrick, Chun, & MacInnis, 2009; Schneider et al., 2017; Schwarz, 2000; Winterich & Haws, 2011). For example, findings from Winterich and Haws (2011) demonstrated not only the stronger persuasive power of future-oriented emotions (i.e., anticipated pride) relative to past-focused emotions (i.e., pride) but also the superiority to positive anticipated emotions (i.e., anticipated pride) relative to negative anticipated emotions when it comes to individuals' self-control, which require immediate indulgence to perform a distal benefit behavior, such as recycling (Schneider et al., 2017). Baumeister et al. (2007) also emphasized the role of anticipated emotions in human decision-making by proposing a perspective of emotion as feedback system. According to this perspective, emotion is not a direct cause of behavior but functions as a feedback (i.e., anticipated emotional outcome) of behavior; people act based upon anticipated emotional outcomes (i.e., anticipating emotional outcomes – action – experiencing emotional outcomes). Findings from prior research indicated that future-oriented positive discrete emotions such as anticipated pride would be influential on behaviors that are associated with delayed benefits and require inhibition of immediate gratifications to

acquire long-term goals such as delayed positive outcomes (Schneider et al., 2017; Winterich &

Haws, 2011).

Authentic pride, as a self-conscious emotion, enables individuals to experience how they

might feel in the future after performing a certain task. The process of imaging oneself or an

event in the future allows individuals to manage their current behavior based on the future

consequences including emotional experiences they expect to result from that behavior.

Researchers state that experiencing or anticipating authentic pride is a driving force of not only

pro-social behaviors, such as caregiving and achievement (Tracy & Robins, 2004a, 2004b), but

also pro-environmental behaviors (Onwezen et al., 2013; Peter & Honea, 2012; Schneider et al.,

2017), such as recycling (Vining & Ebreo, 2002). In such cases, anticipated pride can serve as an

incentive to persevere at a task despite its initial costs (Williams & DeSteno, 2008).

Additionally, since people want to experience and maintain positive emotions, anticipated pride

can play a role in regulating people's thoughts, feelings, and behavior in order to help them meet

or exceed social norms and standards (Fischer & Tangney, 1995; Katzir et al., 2010; Patrick et

al., 2009; Schneider et al., 2017; Winterich & Haws, 2011). Furthermore, anticipated pride could

serve as a motivator or reinforcer of altruistic or pro-environmental behaviors by providing

immediate and salient feedback or incentives, compensating for delayed benefits, and rewarding

initial efforts (Baumeister et al., 2007; Baumgartner et al., 2008).

Frijda (1986) acknowledged that the expectation of emotions is a motivational force of

one's action or inaction. Anticipated emotions are the emotions that motivate individuals to

engage in volitional activities and goal-directed behaviors (Bagozzi, Baumgartner, Pieters, &

Zeelenberg, 2000; Bagozzi & Pieters, 1998). Given the future-oriented nature of anticipated

pride, it is necessary to distinguish two types of future-oriented emotion: anticipatory emotion

and anticipated emotion (Baumgartner et al., 2008; Carrera, Caballero, & Munoz, 2012; Loewenstein, Weber, Hsee, & Welch, 2001). Anticipatory emotions are current emotional responses to something that could possibly occur in the future (e.g., fear or hope) while anticipated emotions are expected to be experienced in the future based on pre-factual thinking of an event that does or does not happen (e.g., anticipated regret or anticipated joy). Thus, uncertainty about what is going to happen is associated with anticipatory emotions not with anticipated emotions. Anticipated emotions occur via mental simulation so these emotions do not involve actual uncertainty. That is to say, anticipated pride can be defined as individuals' expectation to experience the feeling of pride in the future based on pre-factual thinking of their performance regardless of they actually perform or not. Anticipated pride plays a role as a motivator of socially desirable or approved behaviors, such as recycling as well as an affective response to perceived approval of one's action (Baumgartner et al., 2008). In other words, anticipated pride may influence an individual's current decision with imagined positive outcomes and thus encourage them to take actions (or inactions) to achieve them (Baumgartner et al., 2008; Winterich & Haws, 2011).

The results from a meta-analysis conducted by DeWall et al. (2016) indicated reliable impacts of anticipated emotions on social behavior and judgment relative to currently felt emotions. DeWall et al. (2016) contended that it is important to research the effect of anticipated emotion on behavior and judgment since it may improve the predictive power of human's behavioral outcomes. Baumeister et al. (2007) also recommended to study the effect of anticipated emotion in human judgement and decision-making. Furthermore, Schneider et al. (2017) urge to examine the effects of anticipated emotion appeal in messages for pro-environmental behaviors, specifically focusing on positive anticipated emotions relative to

anticipated negative emotions to avoid a message reactance (i.e., psychological reactance). Accordingly, this study attempts to provide an explanation of the effects of emotional descriptive norms message (EDNM) applying anticipated pride appeal by exploring the anticipated emotional process as a mediator in the relationship between emotional descriptive normative message (EDNM) and individuals' attitudes and behavioral intentions toward recycling.

This section has addressed the definition and functions of anticipated pride. Given the persuasive power of positive anticipated emotions in initiating, changing, or reinforcing environmentally-friendly behaviors, several studies have examined how anticipated feelings of pride motivate people to participate in other pro-environmental behaviors (Carrus, Passafaro, & Bonnes, 2008; Onwezen et al., 2013; Onwezen et al., 2014b; Schneider et al., 2017), but few research has explored the role of anticipated pride in the context of recycling. The following section reviews prior literature in which emotions, including anticipated pride, were used as persuasive strategies to motivate people to take action in the context of sustainability, such as recycling.

Anticipated Pride in Prior Literature

In the field of communication, a number of studies have been designed to understand the motivators behind pro-environmental behaviors with the objective of fostering such behaviors through persuasive messages. Among these studies, several studies state the significant role that emotions play in encouraging pro-environmental behaviors, such as recycling (Grob, 1995; Lord, 1994; Meneses, 2010; Smith, Haugtvedt, & Petty, 1994; Vining & Ebreo, 1992, 2002). To illustrate, several prior studies have focused on exploring the role of negative anticipated emotions in stimulating recycling (Elgaaied, 2012; Meneses, 2010). For example, Elgaaied (2012) investigated the effect of anticipated guilt on the association between people's

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environmental concern/awareness of negative consequences and individuals' intention to recycle. The findings indicated that, as individuals were more concerned about the environment and more aware of the negative consequences resulting from not recycling, they were more likely to intend to recycle, which was mediated by the increased levels of anticipated guilt. That is to say, not enacting a socially desirable behavior enables people to imagine how they would feel (i.e., anticipated guilt) when not conducting the behavior. In turn, the future-oriented emotion would serve as a motivator of a socially desirable behavior, in this case of recycling. Researchers argue that recycling is not a high-involvement behavior, and thus, emotional processes and components would be more relevant to recycling than cognitive processes and components (Kalafatis, Pollard, East, & Tsogas, 1999; Meneses, 2010; Smith et al., 1994).

On the other hand, several studies have also demonstrated the important roles of positive emotions in the context of environmentally-friendly behaviors (Corral Verdugo, 2012; Meneses, 2010; Onwezen et al., 2013; Onwezen et al., 2014b; Schneider et al., 2017; Smith et al., 1994). For example, a study conducted by Meneses (2010) indicated that actual recycling behavior was strongly associated with emotion rather than cognition. In particular, recycling behavior was more dependent on positive emotions than negative ones. These findings imply that, for maximum effectiveness, campaigns should incorporate emotional components in their messages in order to promote desired behaviors, such as recycling.

As an another example, Carrus et al. (2008) conducted two field studies in Italy, based on the model of goal-directed behaviour (MGB), which is an extended form of TPB. They examined the predictors of individuals' desire and intentions to engage in environmentally-friendly behaviors with past behavior, positive anticipated emotions (i.e., delighted, excited, happy, glad, satisfied, proud, and self-assured), and negative anticipated emotions (i.e., angry, frustrated,

unsatisfied, discontented, guilty, sad, disappointed, depressed, and fearful) in addition to the

three predictors in TPB. Specifically, they were interested in two pro-environmental behaviors,

using public transportation (study 1) and recycling household waste (study 2). In study 1, both

positive anticipated emotions and negative anticipated emotions significantly predicted the desire

for using public transportation in addition to subjective norms, PBC, and past behaviors whereas

in study 2, only negative anticipated emotions predicted the desire for engagement in recycling

in addition to subjective norms and past behaviors. Furthermore, past behavior and the desire to

participate in those pro-environmental behaviors positively predicted the intentions of pro-

environmental behaviors in both study 1 and study 2. However, both positive anticipated

emotions and negative anticipated emotions were not significant predictors of intentions.

In a study of other pro-environmental behaviors in other countries, Onwezen et al. (2013)

investigated the moderating and mediating roles of positive and negative anticipated emotions

within the norm activation model (NAM; Schwartz, 1977) in Netherland. According to the

NAM, there are two predictors activating personal norms: the awareness of behavioral

consequences when performing or not performing a certain behavior and the feeling of

responsibility for conducting the behavior. The NAM proposes that the relationship between

awareness of consequences and personal norms is mediated by the feelings of responsibility.

And, personal norms are the most proximal predictor of the behavior. Based on the NAM,

Onwezen et al. (2013) explored the roles of anticipated pride of action and anticipated guilt of

inaction in the context of two different pro-environmental behaviors: buying environmentally

friendly products and traveling in environmentally friendly ways. They found that, when people

understood the consequences and thus felt a responsibility to perform these two environmentally

friendly behaviors, their personal norms were activated. Subsequently, the activated personal

norms led to pro-environmental behaviors, which were mediated by anticipated pride and anticipated guilt. That is to say, as people had greater feelings of anticipated pride and guilt, they were more likely to follow their personal norms and behave in a norm-congruent way.

Based on NAM, Rezvani, Jansson, and Bengtsson (2017) also conducted an online survey to investigate the roles of anticipated emotions of adoption and personal moral norms in the context of adoption of a pro-environmental product, electronic cars in Sweden. Similar to findings from Onwezen et al. (2013), they found that environmental awareness and anticipation of responsibility influenced personal moral norms; the negative anticipated emotions (i.e., nervous, regret, and embarrassed) and positive anticipated emotions (i.e., proud, excited, and pleasant) mediated the relationship between personal moral norms and behavioral intention to adopt a pro-environmental product. These findings (Carrus et al., 2008; Onwezen et al., 2013; Rezvani et al., 2017) imply that not only negative anticipated emotions but also positive anticipate emotions are associated with various pro-environment behaviors and could encourage individuals to engage in pro-environmental behaviors such as recycling. However, a recent study conducted by Schneider et al. (2017) urges researchers to utilize positive anticipated emotions such as anticipated pride to persuade people to engage in pro-environmental behaviors relative to negative anticipated emotions, such as anticipated guilt.

Schneider et al. (2017) conducted an online experiment to compare the relative effects of anticipated pride and anticipated guilt in the domain of pro-environmental decision making. In their experiment, participants were asked to read or write something arousing anticipate pride or anticipated guilt because of their pro-environmental behavior-related decisions. They argued that these induction types were used to make the emotional response salient right before answering a questionnaire which asked participants to make environmental decisions (i.e., reporting their

behavioral intentions using two scales, and making donation to a nonprofit environmental advocacy organization ($0 - $10) as a measure for actual behavior). Also, they included a control group where participants did not experience anticipated pride nor anticipated guilt but answered the questionnaire. Findings from their experiment overall indicated the stronger positive impact of anticipated pride on pro-environmental related decision making and intention relative to anticipated guilt whereas there was no significant difference in the amount of donation participants were willing to make between anticipated pride and anticipated guilt conditions. Their findings showed the distinct roles of discrete anticipated emotions; anticipated pride is a more persuasive and effective element than anticipated guilt in the domain of pro-environmental behaviors.

In a study of recycling and emotional appeals, Lord (1994) explored the joint effect of emotional appeals (fear vs. satisfaction) and source types (advertising, publicity, and personal-influence) on increasing the participation rate for the community's recycling program. The results indicated that the satisfaction appeal message produced more favorable beliefs and attitudes toward recycling. On the other hand, the fear appeal message was more effective in promoting actual recycling behavior. Except for the Lord (1994)'s study, there is lack of interest in examining the role of emotional appeals in a persuasive message fostering recycling.

Based on the findings from prior research discussed above, it is reasonable to argue that the self-regulatory functions of the self-conscious, future-oriented positive discrete emotion, *anticipated pride,* guides the actions of individuals in the context of recycling. Harth et al. (2013) argue that pride has significant implications for behavioral outcomes in the context of pro-environmental behaviors, including recycling, since it is considered an affective conduct (Smith et al., 1994).

Summary and Implications

To sum up, the potency of anticipated pride in explicating human decision-making and behavior has been demonstrated in the context of pro-environmental behaviors, yet few studies have incorporated the feelings of anticipated pride in a persuasive message. Furthermore, anticipated pride has not received much attention in the field of communication, though it has recently been a topic of focus in the fields of psychology and marketing such as environmental psychology and consumer psychology (Onwezen et al., 2013; Onwezen et al., 2014b; Rezvani et al., 2017; Schneider et al., 2017). The common finding across various disciplines has been that anticipated pride is a strong predictor of individuals' intentions to engage in socially desirable or environmentally-friendly behaviors. In other words, eliciting positive future-focused emotions such as anticipated pride is effective in leveraging public action in a socially desirable way. Carrus et al. (2008) and Schneider et al. (2017) suggest that promotional campaign messages could be more effective in inspiring pro-environmental behaviors by associating positive emotional experiences with a specific action, such as drawing a link between anticipated pride and recycling. In this sense, anticipated pride might function as a benefit that people could achieve by enacting pro-environmental behaviors, which are socially desirable.

In the field of communication, to the best of my knowledge, there is no prior research manipulating anticipated pride in a persuasive message and testing its effects on human's decision-making and behavior. It would be beneficial to investigate the efficacy of anticipated pride appeal in persuasive messages and the role of feeling of anticipated pride in persuasion processes to better understand the association between emotions and persuasion. This dissertation attempts to make standard descriptive norms messages (SDNMs) more persuasive by incorporating anticipated pride contents into the messages. It is expected that the combined effect

of descriptive norms information and anticipated pride appeal in a message enhances persuasion as descriptive norms information provides a behavioral guidance as a heuristic cue as well as anticipated pride functions as an affective incentive to performing a socially desirable but distal benefit behavior, recycling. Combining descriptive norms information, the prevalence information, and anticipated pride appeal in an emotional descriptive norms message (EDNM) would make the normative influence more persuasive due to the social nature of anticipated pride, which influences people' attitudes and behavioral intentions.

Chapter 3: Research Hypotheses

The literature reviewed above suggests that social norms messages could be more persuasive when incorporating anticipated emotions in the messages. Although a large body of research has shown that social norms messages are effective in influencing people's decision-making processes including perceptions, attitudes, and behavioral intentions, it has also pointed out that social norms messages need to be improved by incorporating emotions (Blanton, Köblitz, & McCaul, 2008). Nabi (2010) argues that emotions are the critical motivators of individual behaviors. In particular, anticipated emotions would be significantly important in promoting people's behavioral adherence to the social norms messages as anticipated emotions are the motivational force to avoid doing bad/wrong and do good/appropriate things (Baumeister et al., 2007; Baumgartner et al., 2008). Researchers also suggested to explore the joint effects of normative influence and anticipated emotions (Brewer, DeFrank, & Gilkey, 2016; Richard, Vries, & Pligt, 1998) in persuasion. Considering the call from prior research and roles of social norms and anticipated emotions in persuasion, this dissertation proposes a new message design strategy of social norms messages to enhance persuasive power of standard social norms messages (SDNM): *emotional descriptive norms message* (EDNM). An emotional descriptive norms message (EDNM) refers to a message including both normative information about the prevalence a certain behavior and emotional appeals. In other word, the emotional descriptive norms messages (EDNMs) apply emotional appeals to the standard descriptive norms message (SDNM), which are expected to improve the effect of standard descriptive norms messages (SDNMs) in persuasion processes. Accordingly, this dissertation tests the effect of emotional descriptive norms messages (EDNMs) on promoting a socially desirable, distal benefit, but initially costly behavior: recycling, compared to the effect of standard descriptive norms

messages (SDNMs) based on the tenets of theories of social norms and literature on anticipated emotions.

Although prior literature has tested and found the measured anticipated emotions, such as anticipated pride, as significant psychological antecedents of behavioral intentions, little prior research has explored the role of anticipated emotions as a manipulated message factor in terms of environment-related issues, such as recycling. Several studies tested the effects of manipulated negative anticipated emotions in persuasive messages, such as anticipated regret or anticipated guilt, in the field of communication (Martinez, 2014; Massi Lindsey, 2005; Parker, Stradling, & Manstead, 1996). For example, Martinez (2014) explored the relative effect of an anticipated-regret-and-attitudinal message versus an attitudinal message in the context of promoting folic acid consumption among young women. In her experiment, the anticipate regret appeal in the anticipated-regret-and-attitudinal message was manipulated using only a verbal cue such as "*I will see future benefits and I won't have any regrets... I feel great after awhile, and in the future this is something I won't regret.*" Both the anticipated regret-and-attitudinal message and the attitudinal message included the same two visual cues (i.e., pictures), women's smiling faces. She found that young women who were exposed to the anticipated regret-and-attitudinal message experienced greater feelings of anticipated regret and showed stronger intention to intake folic acid in the future than those who were exposed to the attitudinal message without anticipated-regret components although it was not statistically significant (Martinez, 2014).

There has been little interest in manipulating anticipated emotions in a persuasive message so that limited strategies have been applied to manipulate anticipated emotions. Prior research used verbal cues such as words or sentences whereas rarely utilized visual cues such as imagery or colors to manipulate emotions. In addition to the verbal cues, visual cues would be

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effective tools to increase engagement (e.g., perceived self-efficacy or emotional experiences),

capture people's attention, to enhance their comprehension of the message contents, to help them

recall the message contents, and to improve their adherence to message recommendations

(Dixon, McKeever, Holton, Clarke, & Eosco, 2015; Gibson & Zillman, 2000; Hart & Feldman,

2016; Houts, Doak, Doak, & Loscalzo, 2006; Powell, Boomgaarden, De Swert, & de Vreese,

2015) since they have emotive impact, which significantly influences persuasion processes

(Joffe, 2008). Findings from prior literature indicated that additional imagery in messages or

pictures in news articles influenced persuasive processes via aroused emotional experiences

(Powell et al., 2015; Seo & Dillard, 2016). Hart and Feldman (2016) asserted that researchers

continue to explore the independent as well as interactive effects of verbal (e.g. text) and visual

(e.g. a picture) information in persuasion processes. As such, it would be beneficial to use both

verbal and visual information to manipulate a positive anticipated emotion, anticipated pride, and

thus this current research uses both text and a picture to manipulate anticipated pride. That is,

anticipated pride appeal was manipulated using both a verbal and a pictorial information.

Despite the limited number of empirical studies about the anticipated emotion-focused

messages, it seems reasonable to expect that people who view the emotional descriptive norms

messages (EDNMs) including both descriptive norms information and anticipated emotional

appeal would report greater feelings of the anticipated emotion than those who view the standard

descriptive norms messages (SDNMs) or those who do not view any messages. Based on the

findings from prior research, it is predicted:

H1a: Participants who view messages that include both descriptive norms information

and anticipated pride appeal (i.e., emotional descriptive norms messages) will report greater

feelings of anticipated pride than those who do not view any messages (i.e., a control condition).

H1b: Participants who view messages that include only descriptive norms information (i.e., standard descriptive norms messages) will report greater feelings of anticipated pride than those who do not view any messages (i.e., a control condition).

H1c: Participants who view messages that include both descriptive norms information and anticipated pride appeal (i.e., emotional descriptive norms messages) will report greater feelings of anticipated pride than those who view messages that include only descriptive norms information (i.e., standard descriptive norms messages).

Several studies have tested the relationship between social norms messages and attitudes (Lapinski et al., 2013; Lapinski et al., 2007; Melnyk, Herpen, Fischer, & van Trijp, 2011; Melnyk et al., 2013). The findings from the previous research have supported the positive associations between social norms messages and attitudes. In other words, when people recognize and perceive the prevalence of a certain behavior via the mediated communication, they tend to have favorable attitudes toward the behavior. For example, Lapinski et al. (2013) tested whether the standard descriptive norms messages (SDNMs) influence hand-washing attitudes; the findings indicated that people who viewed the standard descriptive norms messages (SDNMs) reported more favorable attitudes toward hand-washing than those in the control condition where people did not view any messages.

Likewise, based on the findings from prior literature, it might be reasonable to assume that normative information such as the prevalence of a certain behavior among one's social group members would be a heuristic rule or a social standard that people tend to use to make a decision. In the decision-making process, the normative information could be processed through heuristic and/or systematic processing (Chaiken, 1987; Chaiken, Liberman, & Eagly, 1989; Zuckerman & Chaiken, 1998), which would allow people's attitudes toward the behavior to

undergo a positive shift and thus lead to positive attitude changes. Considering the future-oriented characteristics and functions of anticipated emotions including anticipated pride as a reward, emotional descriptive norms messages (EDNMs) would have a positive additive effect on attitudes. In the current dissertation, attitude is defined as the extent to which a person evaluates an attitude object (i.e., a target behavior) favorably or unfavorably (Ajzen, 1991). Thus, it is predicted that:

H2a: Participants who view messages that include both descriptive norms information and anticipated pride appeal (i.e., emotional descriptive norms messages) will have more positive attitude toward the target behavior than those who do not view any messages (i.e., a control group).

H2b: Participants who view messages that include only descriptive norms information (i.e., standard descriptive norms messages) will have more positive attitude toward the target behavior than those who do not view any messages (i.e., a control group).

H2c: Participants who view messages that include both descriptive norms information and anticipated pride appeal (i.e., emotional descriptive norms messages) will have more positive attitude toward the target behavior than those who view messages that include only descriptive norms information (i.e., standard descriptive norms messages).

People acknowledge the desirability of recycling. Yet, not everyone undertakes such desirable behavior since recycling commonly involves an initial cost for delayed long-term benefits. Since the delayed benefits could be perceived as uncertain and ambiguous relative to the immediate cost, people may not be certain what desirable and responsible behaviors are. Under such uncertain and ambiguous situations, social norms are significant motivators of human actions (Cialdini et al., 1991; Cialdini et al., 1990; Lapinski & Rimal, 2005). Prior

literature has demonstrated that both descriptive norms and injunctive norms are effectively encouraging different environment-related behaviors under such conditions (Cialdini et al., 2006; Cialdini et al., 1991; Cialdini et al., 1990; Goldstein et al., 2008; Lapinski et al., 2007; Lapinski et al., 2015; White & Simpson, 2013). Similarly, in the context of recycling where the distal benefits are perceived as uncertain and ambiguous, it is reasonable to assume that people tend to perform what most others do since the prevalence information informs and guides their behaviors. However, when delivering social norms messages about recycling, it would be beneficial to make the expected future outcomes (i.e., either negative or positive outcomes) less ambiguous and more certain.

Anticipated emotions such as anticipated pride would be useful components to make the perceived distal benefits less uncertain; experiencing anticipated pride will provide an incentive to persevere at a task despite its initial costs. In other words, anticipated emotions allow individuals to manage their current behavior based on the future affective consequences they expect to result from that behavior. It is reasonable to assume that anticipated pride is a strong determinant of human decision-making as well as drive for performing socially responsible behaviors since people want to experience or maintain the positive feelings such as anticipated pride by following the prevalent or popular behaviors in the messages (Bissing-Olson et al., 2016; Fischer & Tangney, 1995; Gilovich & Medvec, 1995; Katzir et al., 2010; Patrick et al., 2009; Shimanoff, 1984; Winterich & Haws, 2011).

Considering the roles of anticipated emotions as motivators or reinforcers of socially desirable behaviors, this dissertation attempts to directly examine the combining effect of descriptive norms information and anticipated emotion appeal in a persuasive message (i.e., emotional descriptive norms messages) to enhance individuals' engagement with recycling

focusing on two behaviors: a) intend to recycle and b) intend to talk about recycling with their family. Theories of social norms posit that social norms influence behavioral components. When anticipated pride is added to the standard descriptive norms messages (SDNMs), the messages' persuasive impact will be increased since the suggested normative behaviors help maintain or enhance positive feelings of anticipated pride. Thus, emotional descriptive norms messages (EDNMs) will be more persuasive to promote the norm-congruent behaviors than standard descriptive norms messages (SDNMs). It is expected that emotional descriptive norms messages (EDNMs) is superior to standard descriptive norms messages (SDNMs) since emotional descriptive norms messages (EDNMs) allow individuals to have an opportunity to achieve both intrapersonal goals (e.g., making accurate/efficient decisions by following what many people do) as well as interpersonal goals (e.g., enhanced positive self-worth or perceived social approval via the experience of feeling of anticipated emotion). That is, anticipated pride appeals would function as rewards in the emotional descriptive norms messages (EDNMs), which enhances the persuasive power of normative influence. That is, it is expected that emotional descriptive norms messages (EDNMs) will affect people's behavioral intention to recycle. Thus, it is predicted that:

H3a: Participants who view messages that include both descriptive norms information and anticipated pride appeal (i.e., emotional descriptive norms messages) will be more likely to intend to recycle than those who do not view any messages (i.e., a control group).

H3b: Participants who view messages that include only descriptive norms information (i.e., standard descriptive norms messages) will be more likely to intend to recycle than those who do not view any messages (i.e., a control group).

H3c: Participants who view messages that include both descriptive norms information and anticipated pride appeal (i.e., emotional descriptive norms messages) will be more likely to

intend to recycle than those who view messages that include only descriptive norms information (i.e., standard descriptive norms messages).

In addition, it is important to examine the role of interpersonal communication in persuasion processes since conversation about a topic in messages plays an important role in diffusing the messages and change beliefs and behaviors (Hwang, 2012; Park & Smith, 2007; Southwell & Torres, 2006; Southwell & Yzer, 2007; Vu & Gehrau, 2010). B. G. Southwell and Yzer (2007) explained three potential roles that interpersonal communication could play in executing communication campaign and assessing communication campaign's return on investment (ROI): first, interpersonal discussion as an outcome of campaign after exposure to the campaign (Southwell & Torres, 2006), second, interpersonal discussion as a mediator between campaign exposure and campaign goals , lastly, interpersonal discussion as a moderator in the association between campaign exposure and campaign goals (Lee, 2009).

This dissertation examined the role of interpersonal discussion as an outcome of exposure to social norms messages. That is, interpersonal discussion is regarded as one of ROI, which assesses the effectiveness of the social norms messages. For example, Southwell and Torres (2006) explored how media exposure influences interpersonal discussion regarding issues on science, technology, engineering, and mathematics by explicating an underlying mechanism. Their findings from an experiment indicated that perceived ability to understand science mediated the association between exposure to television media content on science (i.e., science news stories) and interpersonal discussion following media exposure. In other words, people who had greater exposure to science news stories raised their perceived confidence in their ability to understand science-related topics, which stimulated and facilitated conversations about the news stories compared to those who had less exposure to science news stories.

Further, messages evoking strong emotions were more likely to go viral (Phelps, Lewis, Mobilio, Perry, & Raman, 2004) and interpersonal channels are regarded as a better way to deliver normative information (Geber, Baumann, & Klimmt, 2019; Lee, 2009) relative to media channels. That is, it is expected that emotional descriptive norms messages (EDNMs) will influence people's behavioral intention to talk about the issue in the messages. Thus, it is hypothesized that:

H4a: Participants who view messages that include both descriptive norms information and anticipated pride appeal (i.e., emotional descriptive norms messages) will be more likely to intend to talk about recycling with their family than those who do not view any messages (i.e., a control group).

H4b: Participants who view messages that include only descriptive norms information (i.e., standard descriptive norms messages) will be more likely to intend to talk about recycling with their family than those who do not view any messages (i.e., a control group).

H4c: Participants who view messages that include both descriptive norms information and anticipated pride appeal (i.e., emotional descriptive norms messages) will be more likely to intend to talk about recycling with their family than those view messages that include only descriptive norms information (i.e., standard descriptive norms messages).

Anticipated emotions help explicate why people engage in a certain behavior recommended in emotional descriptive norms message (EDNM) to avoid negative anticipated emotions or experience positive anticipated emotions in the future (DeWall et al., 2016). Prior research examining the effects of pride or anticipated pride demonstrated that people who felt pride or anticipated pride based on their engagement in pro-environmental behaviors were likely to perform the pro-environmental behaviors in the future (Bissing-Olson et al., 2016; Schneider

et al., 2017). That is, it is expected that emotional descriptive norms messages (EDNMs) will influence people's behavioral intention to recycle and their behavioral intention to talk about the issue in the messages via their feeling of anticipated pride. Thus, it is hypothesized that:

H5a: The effects of emotional descriptive norms messages (EDNMs) on behavioral intent to recycle will be mediated by anticipated pride.

H5b: The effects of emotional descriptive norms messages (EDNMs) on behavioral intent to talk about recycling with their family will be mediated by anticipated pride.

The TNSB has delineated the boundary conditions in the relationship between descriptive norms and behavioral outcomes. Recently, researchers have investigated other factors beyond the individuals-level moderators based on an attribute-centered approach (Chung & Rimal, 2016; Chung & Lapinski, 2018; Lapinski et al., 2013; Lewis, 2013). According to the attribute-centered approach (Rimal et al., 2011), taking into account the properties of a given behavior helps researchers understand the persuasion processes and thus effectively persuade people to act.

One of the behavioral attributes that are closely related to social norms is behavioral privacy. The behavior privacy in the attribute-centered approach stands for that a behavior could be located on opposite sides of a behavioral attribute continuum: private/closed – public/opened. Normative influence becomes stronger when the behavior is characterized by openness or publicness. Publicness means that an enactment will be observed by others since it is often performed in public. In this regard, recycling could be perceived between the private and openness/publicness on the behavioral attribute continuum based on where it is performed or based on the possibility that one's behavior could be observed by other people. However, findings from prior research are mixed. For example, the presence of others did not enhance the effects of descriptive norms on a behavior regarding hand-washing in a field experiment

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(Lapinski et al., 2013) whereas the observability of an enactment by others enhanced the influence of injunctive norms on behaviors in sun protection and nutrition behaviors in online experiments (Lewis, 2013). Thus, this dissertation further examined the role of behavioral privacy in the relationships between descriptive norms messages and behavioral intention in the context of recycling using an online experiment. It is reasonable to assume that when people perceive recycling as a public behavior they are more likely to follow what many others do than when people perceive recycling as a private behavior.

Furthermore, the social nature of anticipated pride implies that people tend to experience anticipated pride when they are acknowledged by others in public or at least when there is the possibility that their behavior can be known to others. Thus, this dissertation tests the moderating role of recycling's perceived behavioral privacy in the relationship between two normative messages (i.e., emotional descriptive norms messages and standard descriptive norms messages) and behavioral intentions.

H6a: The relationship between standard descriptive norms messages (SDNMs) and intentions to recycle will increase in magnitude as participants perceive the recycling as a public behavior more than as a private behavior.

H6b: The relationship between emotional descriptive norms messages (EDNMs) and intentions to recycle will increase in magnitude as participants perceive the recycling as a public behavior more than as a private behavior.

Chapter 4: Methods

This chapter is to outline study methodologies. This study consisted of pilot studies and a main experiment. The purpose of the pilot studies was to develop the stimuli for the main experiment and check manipulation factors within persuasive messages as stimuli (i.e., anticipated pride, perceived descriptive norms contents in a message, and perceived prevalence of recycling) as well as the quality of messages (i.e. perceived believability). The main experiment was designed with a pre- and post-test. In the main experiment, a two-similar message sequence was used to capture the effects of moderate level of message repetition. Anticipated pride in the messages and the order of presentation was manipulated experimental factors. Participants viewed two messages (i.e., either two emotional descriptive norms messages (EDNMs) or two standard descriptive norms messages (SDNMs)) and the order of the messages was counterbalanced to control for order effect. The five dependent variables were measured through an online-based survey: anticipated pride, attitudes toward conducting recycling, behavioral intentions to recycle, behavioral intentions to talk about recycling with family members, and perceived behavioral attributes of recycling (i.e., behavioral privacy).

STIMULI MATERIALS

This study used descriptive norms messages as the stimuli to test the effect of EDNMs on outcomes compared to SDNMs. As recommended by Smith, Atkin, Martell, Allen, and Hembroff (2006), messages were designed to be believable in order to avoid potential unintended consequences (as being checked in the pilot studies as well as in the main experiment). The descriptive norms information and anticipated pride appeal were highlighted in the headline. The descriptive norms information (i.e., high prevalence of recycling) was expressed using a high percentage of people who recycled. As Kormos, Gifford, and Brown

(2015) suggested, the stimuli messages used factual normative information (Statista, 2017). The descriptive norms information was: *In 2017, more than 80% of people in the U.S. recycled the materials they used.* The EDNMs and the SDNMs included the same descriptive norms information in the headline. Also, both the EDNMs and the SDNMs described the benefits of recycling. To hold the argument quality constant and invariantly strong across experimental conditions, factual evidence from a qualified source (e.g. United States Environmental Protection Agency [EPA]) were cited to describe the benefits of recycling.

The only difference between the EDNMs and the SDNMs was anticipated pride appeal; only the EDNMs included anticipated pride appeal using verbal and visual cues. The verbal cue manipulated in the headline was "*Your family will be proud of you if you recycle*" in the EDNMs. In addition to the verbal cue, anticipated pride was manipulated using a visual cue, a picture (Hart & Feldman, 2016), considering the compatibility between verbal and visual cues (Seo & Dillard, 2016; Tukachinsky, Mastro, & King, 2011). Prior literature on pride has found that pride is expressed through a distinct nonverbal expression. The prototypical pride expression includes "small smile, with the head tilted slightly back, fully visible expanded posture (i.e., upper body), and either arms raised or hands on hips" (Tracy & Robins, 2004b, 2007b; Tracy et al., 2005). The EDNMs included a picture eliciting a feeling of pride while the SDNMs included a general recycling-related picture which did not intend to arouse a feeling of pride (i.e., recycling bins). All pictures were matched for size. That is, the EDNMs were identical to the SDNMs with two exceptions: verbal and visual cues used to manipulate anticipated pride. The final messages were in poster format (see Appendix B).

PILOT STUDIES

Prior to the main experiment, three pilot tests were conducted to choose stimuli images

and guide the development of experimental stimuli. The first two pilot studies used repeated measures and the last pilot study used a single factor independent groups design with random assignment.

First, six pictures were tested to see whether participants perceived that a picture conveyed a feeling of pride. The order of six pictures was randomized to avoid potential order effect. A scale was adopted from prior literature (Onwezen et al., 2013; Tracy & Robins, 2007a) and consisted of eight items to assess the degree to which participants felt a feeling of pride after viewing each picture (1 = strongly disagree, 7 = strongly agree). A sample item included: *After viewing the picture I felt (like I was or I had) proud, accomplished, confident, satisfied, worthwhile, achieving, fulfilled, and productive*. The number of 31 participants from MTurk completed the survey questionnaire. The sample consisted of more male ($n = 16$, 51.6%) and the mean age was 36.55 ranged from 19 to 68 ($SD = 13.76$). Three pictures with a greater mean were selected to create the EDNMs (see Table 1). The first picture depicted three children who are recycling and expressing a feeling of pride (EDNM 1); the second picture included a woman who shows fully expanded posture (i.e., upper body) and raises her arms (EDNM 2); and the third picture included flags of the U.S. (EDNM 3).

Based on the results from pilot test 1, three EDNMs were created and tested to see whether participants felt the messages conveyed a feeling of pride compared to two SDNMs. The EDNMs and SDNMs were identical in terms of descriptive norms information and information on benefits of recycling. The only difference between EDNMs and SDNMs was an anticipated pride appeal. There were verbal and visual cues in EDNMs to manipulate anticipate pride. EDNM 1 included the picture of children, EDNM 2 included the picture of a woman, and EDNM 3 included the picture of U.S. flags. The verbal cue manipulated in the headline was "*Your family*

will be proud of you if you recycle" in each EDNM. On the contrary, two SDNMs did not include any cues that were supposed to produce anticipated pride or a feeling of pride; the SDNMs included only a visual cue (i.e., a picture of recycling bins), which was not regarded as eliciting anticipated pride or pride. The number of 25 participants from MTurk reported their feeling of pride after viewing each three EDNMs and two SDNMs. The order of the five messages was randomized to avoid potential order effects. The same scale used in the pilot test 1 was utilized in the pilot test 2 after changing the word, *picture,* to *message*: *After viewing the message I felt (like I was or I had) proud, accomplished, confident, satisfied, worthwhile, achieving, fulfilled, and productive*. The sample consisted of more male ($n = 13$, 52%) and the mean age was 37.92 ranged from 21 to 61 ($SD = 10.85$). The results from a series of paired t-tests indicated that EDNM 1 and EDNM 2 were not significantly different in the feeling of pride, t (24) =-.43, $p =$ .67 as well as SDNM 1 and SDNM 2 were not significantly different in the feeling of pride, t (24) = -.70, $p = .49$. There was a significant difference in the feelings of pride between EDNM 1 and SDNM 1, t (24) = 3.03, $p =.006$, EDNM 1 and SDNM 2, t (24) = 2.91, $p = .008$, EDNM 2 and SDNM 1, t (24) =2.95, $p = .007$, and EDNM 2 and SDNM 2, t (24) = 2.80, $p = .01$ (see Table 2). Thus, EDNM 1, EDNM 2, SDNM 1, and SDNM 2 were selected for the main experiment.

Lastly, pilot test 3 was conducted to check perceived descriptive normative contents in the stimuli and perceived prevalence of recycling for the main experiment. Also, believability of the final stimuli was checked (Smith et al., 2006). The pilot test 3 employed a single factor independent groups design with random assignment (EDNM 1 $n = 15$, EDNM 2 $n = 16$, SDNM 1 $n = 15$, and SDNM 2 $n = 14$). It was expected that the four messages did not differ significantly with regards to (a) participants' subsequent perceptions of descriptive normative contents in a

message, (b) participants' subsequent perceptions of prevalence of recycling, and (c) message believability across the four message conditions. Scales for the perception of descriptive normative contents in a message (Lapinski et al., 2013), the perception of prevalence of recycling (Lapinski et al., 2014), and message believability (Beltramini, 1982) were adapted from prior research (see Appendix C). The three measures used 7-point scales. The scale for perceived descriptive normative contents in a message assessed the extent to which participants perceived that the message indicated the high prevalence of recycling. The scale consisted of four items ($M = 5.58$, $SD = 1.27$, $\alpha = .94$). The scale for perceived prevalence of recycling evaluated the extent to which participants perceived that recycling is a prevalent behavior in the U.S. The scale consisted of four items ($M = 5.59$, $SD = 1.32$, $\alpha = .94$). Lastly, the message believability measure assessed the extent to which participants thought that the message they viewed was believable with 10 items ($M = 5.02$, $SD = 1.28$, $\alpha = .94$).

The number of 60 participants reported their perceptions of descriptive normative contents in the message and perceived believability of the message after they viewed one of the four messages. ANOVA analyses were conducted and results showed that there was no significant difference in perceived descriptive norms information in the message, $F (3, 56) = 0.06.$ $p = .98$, perceived prevalence of recycling in the U.S., $F (3, 56) = 0.08.$ $p = .97$, and in perceived believability of the message, $F (3, 56) = 0.01.$ $p = .998$ across the four conditions as expected.

Additionally, the extent to which participants perceived that the message they viewed conveyed injunctive norms information ($M = 5.16$, $SD = 1.16$, $\alpha = .82$) and the extent to which they perceived that recycling is approved in the U.S. ($M = 5.36$, $SD = 1.24$, $\alpha = .81$) were checked. The scales were adopted from prior literature (Lapinski et al., 2014; Lapinski et al.,

2013). The results indicated that there was no difference in perceived injunctive norms information in the message, $F(3, 56) = 1.20$. $p = .32$ and perceived approval of recycling in the U.S., $F(3, 56) = 0.61$. $p = .61$, across the four message conditions (Table 3). The sample consisted of more male ($n = 35$, 58.3%). The mean age of sample was 32.72 ranged from 21 to 87 ($SD = 11.27$). Thus, it was concluded that the stimuli were manipulated as intended. Thus, the resulting messages were used subsequently in the main experiment.

MAIN EXPERIMENT

Design

This study employed a 2 (anticipated pride appeal: presence vs. absence) x 2 (order of presentation) x 2 (behavioral privacy: private vs. public) pre- and post-test between-subject design with an offset control to provide baseline data on the emotional, attitudinal, and behavioral measures in this population. Participants in the control group were only exposed to the outcome measures without viewing any messages. The anticipated pride appeal and the order of presentation were manipulated variables and behavioral privacy was a measured variable. As mentioned above, this current study used a two-similar message sequence to capture the effects of moderate level of message repetition in persuasion (Cacioppo & Petty, 1989) and to avoid a potential backlash effect which results from too much repetition of the same message placed close together (Fernandes, 2013). Also, it was expected that inserting a distractor question between two messages would help reducing participants' resistance to reading another same or similar message subsequently (e.g. boredom). Prior literature on mere exposure effect (Zajonc, 1968) and message repetition (Schmidt & Eisend, 2015; Stephens & Rains, 2011) suggests that message repetition would likely produce positive outcomes in persuasion.

Participants

The number of 280 participants were recruited for the main experiment through Qualtrics Panels in 2018. To be eligible to participate, individuals had to be more than 18 years of age and were based in the United States. Quotas for gender were utilized to ensure a sample that had characteristics similar to census data for the United States. Participants' ages ranged from 18 to 84 ($M = 41.66$, $SD = 16.16$). Male comprised 47.9% ($n = 134$) of the participants and 52.1% ($n = 146$) were female. Participants came from a variety of racial backgrounds although the majority of the participants (78.6%, $n = 220$) were Caucasian/White. Others reported African American/Black (10%, $n = 28$), Hispanic/Latino (6.8%, $n = 19$), Asian American (1.4%, $n = 4$), Asian (1.1%, $n = 3$), Multiracial (1.1%, $n = 3$), Native American (0.7%, $n = 2$), and Pacific Islander (0.4%, $n = 1$). The majority of the participants had completed a 4-year college degree (e.g., BA/BS) (22.1%, $n = 62$), had some college credit without a degree (22.1%, $n = 62$), or completed high school with a diploma or the equivalent (22.1%, $n = 62$). Others reported they had completed a 2-year college degree (16.1%, $n = 45$), a Master's degree (7.5%, $n = 21$), some high school without a diploma (4.3%, $n = 12$), trade/technical/vocational training (3.6%, $n = 10$), a doctorate degree (1.4%, $n = 4$), or a professional degree (MD/JD) (0.7%, $n = 2$). Median income was $40,000 - $49,999. The sample was representative of the U.S. population for gender. Table 4 presents the demographics for the study sample.

Procedure

After participants provided consent to voluntarily participate (Appendix D), they were asked to report their age, gender, whether they currently reside in the U.S., and their general attitude toward environment using New Environmental Paradigm (NEP) Scale (Dunlap & Van Liere, 1978). And then, they were randomly assigned to six conditions. Except for participants in the control conditions, participants viewed the assigned two messages for a minimum of 15

seconds for each message. Participants were not able to proceed to the next page until 15 second

elapses. Participants were asked to answer a distractor question between the two messages (i.e.,

What percentage of people do you think approve of gene editing (0-100%)?). This question was

not relevant to the topic of this study but the question functioned as helping reduce boredom or

resistance to reading repeated messages.

Participants in the first and second conditions viewed two EDNMs and the order of

presentation was counterbalanced. Similarly, participants in the third and fourth conditions

viewed two SDNMs and the order of presentation was counterbalanced. Immediately before the

stimulus messages, participants were informed that they would be viewing two messages and

clearly told about the time they were given to do so. After viewing the two messages,

participants answered an online questionnaire, which included measures for the dependent

variables (i.e., anticipated pride, attitude, behavioral intentions, and behavioral privacy),

manipulation checks, and other demographic information (i.e., race, education, income, and

living state) (see Appendix E). Finally, the fifth and sixth condition served as a no-message

control group, and participants in the fifth and sixth conditions did not view any messages but

rather directly answered the post-test questionnaire (see Table 5). Participants who completed the

online survey received $4 in recognition of their participation.

MEASURES

All measures used 7-point Likert-type scales (e.g., 1 = *strongly disagree* and 7 = *strongly*

agree) otherwise it was identified in the text below. Each measure was checked for inter-item

correlations, item contribution to scale reliability, and internal consistency.

Dependent Variables

Anticipated pride. The degree to which participants would feel pride as a result of performing the pro-environmental behavior under this study, recycling, was measured using nine items (Onwezen et al., 2013; Tracy & Robins, 2007a). Participants were asked to indicate on a 7-point scale ranging from 1 (*not at all*) to 7 (*very much*) how much they *anticipate to have the following emotions if they recycle materials they used after viewing the messages: proud; accomplished; confident; satisfied; worthwhile, achieving; fulfilled; productive; and successful.*

Attitude toward engaging in recycling. Participants' attitude toward engaging in recycling was assessed with both measures of affective and instrumental components of attitudes (Anderson, 2012; Fishbein & Ajzen, 1975). Eight word pairs were used to assess participants' affective states of and evaluative beliefs about engaging in the behavior, recycling: *useless/useful, harmful/beneficial, foolish/wise, bad/good, dumb/smart, negative/positive, unsensible/sensible, non-likable/likable.* All items were assessed on a 7-point bipolar semantic differential scale with higher numbers indicating more positive evaluations.

Behavioral intention to recycle. Participants' intention to recycle was assessed with three items (Ajzen, 1991). Example items included *"I intend to recycle materials that I use"* and *"It is likely that I will put materials into the corresponding recycling bin."*

Behavioral intention to talk. Participants' intention to talk about recycling with their family was measured with four items (Park & Smith, 2007). Example items included *"I intend to talk with my family about recycling in the near future"* and *"I will talk with my family about recycling in the near future."*

Behavioral privacy. The extent to which participants perceived recycling as a private or public behavior was assessed with two measures. The first measure was a 7-point Likert type scale which was adopted from prior literature (Chung & Lapinski, 2018). The measure was

comprised of four items. Example items were *"I can see whether or not people recycle materials they used"* and *"Looking around a public place, people notice when I don't recycle materials I used."*

The second measure has been created for this study. The measure consisted of three items on a 7-point semantic differential scale. The items include "*For me, recycling is a(n)… private behavior/public behavior, non-observable behavior/observable behavior, and inconspicuous behavior/conspicuous behavior.*" Participants reported high numbers, as they perceived recycling as more a public relative to a private behavior.

Manipulation Check Items

Perceived descriptive normative content in the messages. The extent to which participants perceived that the messages indicated the high prevalence of recycling was assessed on the same scale used in the pilot test 3 (Lapinski et al., 2013). Example items included *"The information presented in the messages indicate that most people in the U.S. recycle materials they used"* and *"From the information in the messages, it seems that there are many people in the U.S. who recycle materials they used."*

Perceived injunctive normative content in the messages. A scale to assess the extent to which participants perceived that the messages indicated the approval of recycling was adopted from prior literature (Lapinski et al., 2013). Example items included *"The messages show people in the U.S. approve of recycling"* and *"It is clear from these messages that people in the U.S. believe that recycling is important."*

Perceived prevalence of recycling in the U.S. The extent to which participants perceived that the recycling is a prevalent behavior among people in the U.S. was assessed with four items (Lapinski et al., 2014). Example items included *"Most people in the U.S. engage in*

recycling materials they used" and *"The majority of people in the U.S. engage in recycling material they used."*

Perceived approval of recycling in the U.S. The extent to which participants perceived that recycling is an approved behavior among people in the U.S. was assessed with four items (Lapinski et al., 2014). Example items included *"Recycling is something that most people in the U.S. think I should do"* and *"People in the U.S. may judge me based on whether or not I endorse recycling."*

Potential Covariates

The inclusion of potential covariates was determined based on prior literature (Chung & Rimal, 2016; Dunlap & Van Liere, 1978; Petty & Cacioppo, 1986; Smith et al., 2006).

New Environmental Paradigm (NEP) **scale.** This scale measured the extent to which participants endorsed a pro-ecological world view (Dunlap & Van Liere, 1978). The scale consisted of 12 items. Example items were "*Plants and animals exist primarily to be used by humans (reverse-coded)*" and *"There are limits to growth beyond which our industrialized society cannot expand*."

Message believability. The extent to which participants perceived that the messages were believable and plausible was assessed on the same sematic differential scale used in the pilot test 3 (Beltramini, 1982). The scale was comprised of 10 items: *The messages that I read are…unbelievable/believable, untrustworthy/trustworthy, not credible/credible, dishonest/honest, questionable/unquestionable, not authentic/authentic, unlikely/likely, not convicting/convincing, unreasonable/reasonable, and inconclusive/conclusive.* Participants in the control group were not asked to report the extent to which they thought the messages were believable since they did

not view any messages. Participants reported high numbers, as they perceived the messages as more believable and plausible.

Social desirability. Participants' response bias toward socially desirable behaviors was assessed with a scale developed by Schuessler, Hittle, and Cardascia (1978). The original scale consists of 16 items with a 9-point bipolar rating scale ranging from 1 - low social desirability, to 5 - neutral social desirability, to 9 - high social desirability. For this study, the scale was adapted to a 6-item scale which used 7-point Likert-type responses ranging from 1 (*strongly disagree*) to 7 (*strongly agree*).

Past behavior. The extent to which participants engaged in recycling in the past was assessed with two items (Elgaaied, 2012). First, participants were asked to answer the following question, "*Do you currently recycle all your waste systematically?*" (0 = *Yes,* 1 = *No*). Those who answered "Yes" were subsequently asked to report the percentage of their past recycling behavior (fill out a number between 1% and 100%)." One hundred seventy-three participants (61.8%) reported they were as recyclers.

Self-monitoring. The extent to which participants regulate their behaviors by accommodating their actions in accordance with immediate situational cues (Snyder, 1974) was measured by a scale adopted from prior literature (Lennox & Wolfe, 1984; Spartz, Su, Griffin, Brossard, & Dunwoody, 2017). The scale consisted of seven items. Self-monitoring has been regarded as one of individual traits affecting the relationship between social norms and behavioral outcomes (Chung & Rimal, 2016). Example items were *"I try to pay attention to how others react to my behavior in order to avoid being out of place"* and *"When in a social situation, I tend not to follow the crowd but, instead, behave in a manner that suits my particular*

mood at a time (reverse-coded)." Higher numbers indicated high self-monitors who regulate

their behaviors according to the behaviors of those around them relative to low self-monitors.

Demographic Information

Questions regarding demographic information included age, gender, ethnicity, education,

income, what state s/he lives in. Participants were asked to report their age and gender before

they were exposed to the stimuli messages for those in the experimental conditions and

completed the survey questionnaire. Other questions regarding demographic information were

asked at the end of the survey questionnaire.

Chapter 5: Analysis

This chapter is to outline the analysis this dissertation conducted to test the research hypotheses. Prior to conducting hypothesis tests, all data were cleaned and scaled items were tested for reliability. After composing scales, in a preliminary analysis, the relative associations between variables were examined using correlation analysis.

Before the main analysis, the effect of order of message presentation was checked using a series of independent t-tests. After combining the experimental conditions based on the type of messages, manipulation check was conducted using a series of ANOVAs.

In the main analysis, hierarchical regression analyses were conducted to test research hypotheses (H1-H4, H6). The indirect effects of anticipated pride on intention to recycle and intention to talk about recycling with family (H5) were assessed via path analyses using Hayes' PROCESS-macro Model 4 in SPSS (Hayes, 2013). 95% bias-corrected bootstrap confidence intervals based on 10,000 bootstrap samples were used for statistical inference of indirect effects.

PRELIMINARY ANALYSES

Before testing the research hypotheses, preliminary analyses were conducted. All data were cleaned. In total, 280 participants completed the survey for this study. Three participants who showed low engagement such as straight-lining behavior (answering all questions with the same response) were removed from additional analyses. Thus, responses from 277 participants were used to further analyses.

Scale Reliability

All scaled items were examined for positive contribution of items to scale reliability, item-total correlations, overall scale reliability, and the extent to which the distributions approximated normality. The scale means, standard deviations, and alphas for all scales across

conditions were presented in Table 6. This analysis revealed that scale alphas were largely within acceptable ranges ($\alpha > .70$) with several exceptions. The social desirability ($\alpha = .46$) and self-monitoring ($\alpha = .66$) scales indicated relatively low reliability. To improve the reliability, items that did not contribute to scale reliability were removed from each scale: social desirability ($\alpha = .76$ removed items 4, 5, and 6) and self-monitoring ($\alpha = .78$, removed an item 2).

Analysis for the Order of Presentation

In order to test for order effects, a series of independent t-test was conducted for each of the three experimental groups (i.e., a EDNMs group, a SDNMs group, and a control group) with order as the independent variable and measures for manipulation check and theoretical variables as dependent variables. For a full overview of these tests and results, see Table 7 – 9.

The results indicated that, only for the SDNMs between participants in the condition 3 and condition 4, there was a significant difference in the perceived injunctive norms information in the messages, $t(78) = 2.32$, $p = .02$, $\eta^2 = .06$, such that participants in the condition 3 ($N = 38$, $M = 5.74$, $SD = 0.83$) were more likely to perceive that the messages included injunctive norms information than those in the condition 4 ($N = 42$, $M = 5.21$, $SD = 1.18$). Additionally, as a check on the random assignment to conditions, chi-square tests were used to determine whether demographic variables were distributed similarly across conditions. No significant differences emerged regarding demographic characteristics after random assignment to conditions. Since it is not unusual for descriptive normative information to influence people's perception of injunctive norms (Rimal, 2008), the experimental conditions were collapsed across the order of presentation, and the variable (i.e., perceived injunctive norms information in the messages) was included as a potential covariate in the main analyses. Thus, there were three experimental groups: EDNMs group, SDNMs group, and control group, which were used to further analyses.

MANIPULATION CHECK

To check the stimulus induction, a series of ANOVAs were conducted (see Table 10). The descriptive normative information was manipulated as intended; there was no significant difference in perceived descriptive norms information in the messages between participants who viewed SDNMs ($N = 80$, $M = 5.72$, $SD = 1.19$) and those who viewed EDNMs ($N = 85$, $M = 5.35$, $SD = 1.36$; $F (1, 163) = 3.43$, $p = .07$, $\eta^2 = .02$). A significant difference emerged in participants' perceptions of prevalence of recycling. Participants who viewed SDNMs ($N = 80$, $M = 5.86$, $SD = 1.21$) were likely to perceive that recycling was a more prevalent behavior in the U.S. than those who viewed EDNMs ($N = 85$, $M = 5.22$, $SD = 1.43$). Furthermore, participants who either viewed SDNMs or EDNMs reported significantly greater perceived prevalence of recycling than those who did not view any messages in the control group ($N = 112$, $M = 4.06$, $SD = 1.58$; $F (2, 274) = 38.99$, $p < .001$, $\eta^2 = .06$).

Participants in SDNMs group ($N = 80$, $M = 5.46$, $SD = 1.06$) perceived the messages as showing greater approval of recycling than those in EDNMs group ($N = 85$, $M = 5.09$, $SD = 1.14$; $F (1, 163) = 4.68$, $p = .032$, $\eta^2 = .03$). Also, participants exposed to the SDNMs ($N = 80$, $M = 5.29$, $SD = 1.19$) perceived that recycling is a behavior more strongly approved in the U.S. than those exposed to the EDNMs ($N = 85$, $M = 4.76$, $SD = 1.24$) and those in the control group ($N = 112$, $M = 4.53$, $SD = 1.30$; $F (2, 274) = 8.65$, $p < .001$, $\eta^2 = .06$.). However, there was no difference in perceived approval of recycling in the U.S. between participants in the EDNMs group and those in the control group ($p = .20$).

Regarding the quality of the video messages, no significant difference was found in believability between participants who viewed SDNMs ($N = 80$, $M = 5.89$, $SD = 1.33$) and those who viewed EDNMs ($N = 85$, $M = 5.56$, $SD = 1.31$; $F (1, 163) = 2.53$, $p = .11.$, $\eta^2 = .02$).

Importantly, the overall mean of perceived believability was 5.72 ($SD = 1.33$). The mid-point of the scales for the believability was four (i.e., like 7-point Likert type scale); one-sample t-tests indicated that the mean of believability ($t(164) = 16.70$, $p < .001$, $\eta^2 = .63$) significantly differed from the mid-point. It was reasonable to assume that the stimulus was of good quality (Smith et al., 2007). These findings resulted in inclusion of the variables described above in the analyses of correlations to determine covariates in the current study.

Determination of Covariates

The data were analyzed to examine significant relationships among potential covariates and all theoretical outcome variables (i.e., anticipated pride, attitude toward engaging in recycling, intention to recycling, intention to talk about recycling with their family, and behavioral privacy). Decisions about the inclusion of potential covariates and demographics as control variables were based on Tabachnick and Fidell (2007)'s recommendations for inclusion of covariates. Correlations between all study variables were calculated (Table 11).

Perceived social approval of recycling, NEP scale, message believability, and social desirability were positively related to all theoretical variables. However, as NEP scale was weakly correlated with all theoretical variables, anticipated pride ($r = .18$, $p < .001$), attitude toward engaging in recycling ($r = .24$, $p < .001$), intention to talk ($r = .21$, $p < .001$) and intention to recycle ($r = .36$, $p < .001$), the scale was not included as a covariate in the current study. Also, the association between perceived social approval and anticipated pride ($r = .30$, $p < .001$), the association between perceived social approval and attitude toward engaging in recycling ($r = .16$, $p < .001$), the association between perceived social approval and attitude toward messages ($r = .25$, $p < .001$), and the association between perceived social approval and intention to recycle ($r = .37$, $p < .001$) were relatively weak. Thus, perceived social approval was included as a

covariate when intention to talk was an outcome variable. Social desirability was weakly associated with anticipated pride ($r = .34$, $p < .001$) and attitude toward engaging in recycling ($r = .34$, $p < .001$). Accordingly, social desirability was included as a covariate for tests involving intention to talk and intention to recycle. Only message believability was included as covariates in all regression analyses where anticipated pride, attitude, or intentions were outcome variables. Recyclers reported greater anticipated pride, greater intention to recycle, and greater intentions to talk than non-recyclers. However, the association between prior behavior and anticipated pride ($r = .28$, $p < .001$) and the association between prior behavior and intention to talk ($r = .35$, $p < .001$) were relatively weak. Thus, prior recycling behavior was included as a covariate in analyses of intention to recycle as an outcome variable.

High self-monitors reported greater intention to talk than low self-monitors; however, there was a relatively weak relationship between self-monitoring and intention to talk ($r = .25$, $p < .001$). Women reported more favorable attitude toward messages than men but the association between gender and attitude toward messages was relatively weak ($r = .12$, $p < .05$). Although education ($r = .17$, $p < .001$) and income level ($r = .16$, $p < .001$) were positively associated with intention to recycle, the relationships were relatively weak. Thus, self-monitoring, gender, education, and income lever were not included as covariates.

Chapter 6: Results

To test the study hypotheses, hierarchical regression analyses (H1 – H4, H6) and path

analyses using Hayes' PROCESS-macro (H5) in SPSS were employed. Prior to conducting main

analyses, the three experimental groups were coded, with the control group as 0 (the reference

group) and the other group as 1 to create two dummy variables, each of which represented each

treatment group compared to the control group. The participants' prior recycling behavior was

similarly dummy-coded, with a non-recycler coded as 0 and a recycler coded as 1. Other

continuous variables, except the dependent variables were mean-centered to avoid potential

multicollinearity. Of the study covariates, participants in the control group were not asked to

report the extent to which they thought the messages were believable since they did not view any

messages. Thus, although believability was highly correlated with outcome variables,

believability was not included as a covariate when the each treatment group was compared to the

control group. However, believability was included as a covariate to investigate the messages

effect between SDNMs group and EDNMs group (i.e., two treatment groups). The two treatment

groups were dummy-coded, with SDNMs group coded as 0 and EDNMs group coded as 1. For

each analysis performed, the first block of the regression analyses contained study covariates.

The second block of the regression analyses contained two dummy-coded experimental group

variables or a dummy-coded treatment group variable. A simplified summary of each hypothesis

and its result were provided in Table 12.

H1: ANTICIPATED PRIDE

Hypotheses 1a, 1b, and 1c hypothesized that the messages effect on anticipated pride.

Hypothesis 1a predicted that participants in the EDNMs group would report greater feelings of

anticipated pride than those in the control group and hypothesis 1b predicted that participants in

the SDNMs group would report greater feelings of anticipated pride than those in the control group. And, hypothesis 1c predicted that participants in the EDNMs group would report greater feelings of anticipated pride than those in the SDNMs group.

A covariate, believability, was highly correlated with the dependent variable. To test H1a and H1b, a hierarchical regression analysis was used to examine the messages effect on anticipated pride across three experimental groups. No covariate was used in the first analysis since the analysis included the control group. In the first block, two dummy-coded experimental condition variables were included. The overall model was not significant, $F(2, 274) = 0.75$, $p = .48$ adjusted $R^2 = -.002$. Two experimental condition variables did not account for a significant amount of variance in anticipated pride; there were no significant differences between the control group (the reference group in the analysis) and each treatment group in anticipated pride [control group vs. SDNMs group: unstandardized $\beta = -.03$, SE $= 0.20$, $t = -0.50$, $p = .62$, $sr = -.03$; control group vs. EDNMs group: unstandardized $\beta = .05$, SE $= 0.20$, $t = 0.79$, $p = .43$, $sr = .05$].

To test H1c, another hierarchical regression analysis was employed to examine the messages effect on anticipated pride between two treatment groups. In the first block, believability was included as a covariate. The dummy-coded treatment variable was added in the second block. The overall model was significant, $F(2, 162) = 24.55$, $p < .001$ adjusted $R^2 = .22$. In the first block, believability (unstandardized $\beta = .463$, $SE = 0.08$, $t = 6.60$, $p < .001$, $sr = .46$) was a significant predictor of anticipated pride. In the second block, the treatment group variable accounted for a significant amount of additional variance in anticipated pride, $\Delta R^2 = .02$, $\Delta F(1, 162) = 4.59$, $p = .03$. The results indicated that participants in the EDNMs group had greater anticipated pride than did those in the SDNMs group. (unstandardized $\beta = .15$, $SE = 0.20$, $t =$

2.14, $p = .034$, $sr = .15$). It was concluded that the data were inconsistent with Hypothesis 1a and Hypothesis 1b but consistent with Hypothesis 1c (see Table 13).

H2: ATTITUDE TOWARD ENGAGING IN RECYCLING

Hypotheses 2a, 2b, and 2c hypothesized that the messages effect on attitude toward engaging in recycling. Hypothesis 2a predicted that participants in the EDNMs group would have more positive attitude toward engaging in recycling than those in the control group and hypothesis 1b predicted that participants in the SDNMs group would have more positive attitude toward engaging in recycling than those in the control group. And, hypothesis 1c predicted that participants in the EDNMs group would have more positive attitude toward engaging in recycling than those in the SDNMs group.

To test H2a and H2b, a hierarchical regression analysis was used to examine the messages effect on attitude toward engaging in recycling across the three experimental groups. In the first block, social desirability was included as a covariate. The overall model was not significant, $F (2, 274) = 1.08$, $p = .34$ adjusted $R^2 = .001$. For the predictors in the second block, two dummy-coded experimental group variables were included. The results indicated that the experimental group variables did not account for a significant amount of additional variance in attitude toward engaging in recycling; there were no differences between the control group (the reference group in the analysis) and each treatment group in attitude toward engaging in recycling [control group vs. SDNMs group: unstandardized $\beta = -.02$, SE $= 0.22$, $t = -0.34$, $p = .73$, $sr = -.02$; control group vs. EDNMs group: unstandardized $\beta = -.10$, SE $= 0.21$, $t = -1.44$, $p = .15$, $sr = -.09$].

To test H2c, another hierarchical regression analysis was conducted to examine the messages effect on attitude toward engaging in recycling between the two treatment groups. The

first block included covariates: believability and social desirability. The overall model was significant, $F(2, 162) = 23.90$, $p < .001$ adjusted $R^2 = .22$. In the first block, believability (unstandardized $\beta = .48$, $SE = 0.08$, $t = 6.93$, $p < .001$, $sr = .48$) was the significant predictor of attitude toward engaging in recycling. In the second block, the treatment group variable did not account for a significant amount of additional variance in attitude toward engaging in recycling, $\Delta R^2 = .000$, $\Delta F(1, 162) = 0.07$, $p = .79$. In other words, there was no difference in attitude toward engaging in recycling between EDNMs group and SDNMs group [unstandardized $\beta = -.02$, $SE = 0.21$, $t = -0.27$, $p = .79$, $sr = -.02$]. Thus, it was concluded that the data were inconsistent with Hypothesis 2a, 2b, and 2c (see Table 14).

H3: INTENTION TO RECYCLE

Hypotheses 3a, 3b, and 3c hypothesized that the messages effect on intention to recycle. Hypothesis 3a predicted that participants in the EDNMs group would be more likely to intend to recycle than those in the control group and hypothesis 3b predicted that participants in the SDNMs group would be more likely to intend to recycle than those in the control group. And, hypothesis 3c predicted that participants in the EDNMs group would be more likely to intend to recycle than those in the SDNMs group.

A hierarchical regression analysis was employed to test H3a and H3b. In the first block, social desirability and past recycling were included as covariates. The overall model was significant, $F(4, 272) = 37.16$, $p < .001$ adjusted $R^2 = .34$. In the first block, social desirability (unstandardized $\beta = .44$, $SE = 0.06$, $t = 8.85$, $p < .001$, $sr = .43$) and past recycling (unstandardized $\beta = .33$, $SE = 0.14$, $t = 6.75$, $p < .001$, $sr = .33$) were significant predictors of intention to recycle. For the predictors in the second block, the two experimental group variables did not account for a significant amount of additional variance in intention to recycle, $\Delta R^2 =$

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.001, $\Delta F (2, 272) = 0.28$, $p = .76$. In other words, there were no differences between the control group (the reference group in the analysis) and each treatment group in intention to recycle [control group vs. SDNMs group: unstandardized $\beta = -.02$, SE $= 0.16$, $t = -0.43$, $p = .67$, $sr = -.02$; control group vs. EDNMs group: unstandardized $\beta = .02$, SE $= 0.16$, $t = 0.37$, $p = .71$, $sr = .02$].

To test H3c, another hierarchical regression analysis was used to examine the messages effect on intention to recycle between the two treatment groups. The first block included believability, social desirability, and past recycling as covariates. The overall model was significant, $F (4, 160) = 22.17$, $p < .001$ adjusted $R^2 = .34$. For the predictors in the first block, believability (unstandardized $\beta = .24$, $SE = 0.08$, $t = 3.23$, $p = .002$, $sr = .21$), social desirability (unstandardized $\beta = .28$, $SE = 0.09$, $t = 3.94$, $p < .001$, $sr = .25$), and past behavior (unstandardized $\beta = .32$, $SE = 0.19$, $t = 4.87$, $p < .001$, $sr = .31$) were significant predictors of intention to recycle. In the second block, the treatment group variable did not account for a significant amount of additional variance in intention to recycle, $\Delta R^2 = .005$, $\Delta F (1, 160) = 1.20$, $p = .28$. In other words, there was no difference in intention to recycle between EDNMs group and SDNMs group (unstandardized $\beta = .07$, $SE = 0.18$, $t = 1.09$, $p = .28$, $sr = .07$). Thus, it was concluded that the data were inconsistent with Hypotheses 3a, 3b, and 3c (see Table 16).

H4: INTENTION TO TALK

Hypothesis 4a, 4b, and 4c hypothesized that the messages effect on intention to talk about recycling with their family. Hypothesis 4a predicted that participants in the EDNMs group would be more likely to intend to talk about recycling with their family than those in the control group and hypothesis 4b predicted that participants in the SDNMs group would be more likely to intend to talk about recycling with their family than those in the control group.

To test 4a and 4b, a hierarchical regression analysis was employed to examine the messages effect on intention to talk across the three experimental groups. In the first block, social desirability and perceived social approval were included as covariates. The overall model was significant, $F(4, 272) = 27.24$, $p < .001$ adjusted $R^2 = .28$. Social desirability (unstandardized $\beta = .31$, $SE = 0.09$, $t = 5.18$, $p < .001$, $sr = .27$) and perceived social approval (unstandardized $\beta = .30$, $SE = 0.08$, $t = 5.09$, $p < .001$, $sr = .26$) were significant predictors of intention to talk. In the second block, the two experimental group variables did not account for a significant amount of additional variance in intention to talk, $\Delta R^2 = .006$, $\Delta F(2, 272) = 1.07$, $p = .34$. In other words, there were no differences between the control group (the reference group in the analysis) and each treatment group in intention to talk [control group vs. SDNMs group: unstandardized $\beta = .01$, $SE = 0.22$, $t = 0.09$, $p = .93$, $sr = .01$; control group vs. EDNMs group: unstandardized $\beta = .08$, $SE = 0.21$, $t = 1.36$, $p = .18$, $sr = .07$].

To test H4c, another hierarchical regression analysis was used to examine the messages effect on intention to talk between the two treatment groups. The first block included believability, social desirability, and perceived social approval as covariates. The overall model was significant, $F(4, 160) = 23.32$, $p < .001$ adjusted $R^2 = .35$. For the predictors in the first block, believability (unstandardized $\beta = .39$, $SE = 0.10$, $t = 5.08$, $p < .001$, $sr = .32$), social desirability (unstandardized $\beta = .16$, $SE = 0.12$, $t = 2.10$, $p = .04$, $sr = .13$), and perceived social approval (unstandardized $\beta = .17$, $SE = 0.11$, $t = 2.19$, $p = .03$, $sr = .14$) were significant predictors of intention to talk. In the second block, the treatment group variable did not account for a significant amount of additional variance in intention to talk, $\Delta R^2 = .01$, $\Delta F(1, 160) = 2.39$, $p = .12$. In other words, there was no difference in intention to talk between EDNMs group and

SDNMs group, unstandardized $\beta = .10$, SE = 0.22, $t = 1.55$, $p = .12$, $sr = .10$. Thus, it was

concluded that the data were inconsistent with Hypothesis 4a, 4b, and 4c (see Table 15).

H5: ANTICIPATED PRIDE AS A MEDIATOR

Hypotheses 5 predicted that anticipated pride would mediate the effects of EDNMs on

and intention to recycle (H5a) and intention to talk (H5b). The mediation models with the

dummy-coded treatment group variable (SDNMs group = 0 and EDNMs group = 1) as the

predictor, anticipated pride as the mediator, and the intention to talk and intention to recycle as

the outcome variables were tested, respectively, using Hayes' PROCESS-macro in SPSS (Model

4) (Hayes, 2013). The resulting causal models with path coefficients are illustrated in Figure 1.

For the intention to recycle dependent variable, believability, social desirability, and prior

recycling behavior were included as covariates. Results showed that the treatment group had a

direct effect on anticipated pride, $B = 0.44$, $SE = 0.19$, $t(160) = 2.35$, $p = .02$, 95% CI [.07, .81],

which in turn had a direct effect on behavioral intention to recycle, $B = 0.26$, $SE = 0.12$, $t(159) =$

2.12, $p = .04$, 95% CI [.02, .50]. In addition, there was a significant indirect effect of treatment

on intention to recycle, index =.12. $SE = 0.07$, 95% CI [.01, .30]. Among covariates, social

desirability ($B = 0.27$, $SE = 0.12$, $t(160) = 2.32$, $p = .022$, 95% CI [.04, .50]) and past recycling

behavior ($B = 0.88$, $SE = 0.21$, $t(160) = 4.09$, $p < .001$, 95% CI [.45, 1.30]) influenced

anticipated pride, which affected intention to recycle (social desirability: $B = 0.30$, $SE = 0.14$, t

$(159) = 2.11$, $p = .04$, 95% CI [.02, .58]; past recycling behavior: $B = 0.70$, $SE = 0.23$, $t(159) =$

2.99, $p = .003$, 95% CI [.24, .1.16]). Results indicated that participants who viewed EDNMs

anticipated greater levels of pride and thus were likely to intend to talk about recycling with their

family members as well as intend to recycle.

For the intention to talk dependent variable, believability, social desirability, and perceived social approval were included as covariates. Results showed that the treatment group had a direct effect on anticipated pride, $B = 0.48$, $SE = 0.22$, $t(160) = 2.17$, $p = .03$, 95% CI [.04, .91], which in turn had a direct effect on behavioral intention to talk about recycling with family members, $B = 0.4$, $SE = 0.13$, $t(159) = 3.15$, $p < .001$, 95% CI [.04, .91]. In addition, there was a significant indirect effect of treatment on intention to talk, index $= .19$. $SE = 0.10$, 95% CI [.04, .43]. Among covariates, only believability influenced anticipated pride ($B = 0.36$, $SE = 0.13$, $t(160) = 2.87$, $p = .005$, 95% CI [.11, .61]), which affected intention to talk ($B = 0.36$, $SE = 0.13$, $t(159) = 2.71$, $p = .007$, 95% CI [.10, .63]); believability also had a direct effect on intention to talk ($B = 0.51$, $SE = 0.13$, $t(160) = 3.80$, $p < .001$, 95% CI [.24, .77]). Hence, it was concluded that data were consistent with Hypotheses 5a and 5b.

H6: BEHAVIORAL PRIVACY AS A MODERATOR

Hypotheses 6a and 6b predicted that behavioral privacy moderated the relationship between the normative messages and intention to recycle. Specifically, hypothesis 6a posited that behavioral privacy would moderate the relationship between SDNMs and intentions to recycle. Hypothesis 6b predicted that behavioral privacy would moderate the relationship between EDNMs and intentions to recycle. To test these hypotheses, a hierarchical regression analysis was conducted, with the experimental groups as the independent variables, behavioral privacy as the moderator, and intention to recycle as the dependent variable. The three experimental groups were coded, with the control group as 0 (the reference group) and the other group as 1 to create two dummy variables, each of which represented each treatment group compared to the control group.

In the first block, social desirability and past recycling behavior were included as covariates. In the second block, two dummy-coded experimental group variables and behavioral privacy were entered followed by two interaction terms between each dummy-coded experimental group variable and behavioral privacy. The results showed that the overall model including all the predictors were significant, $F(7, 269) = 23.92$, $p < .001$, *adjusted R^2 = .37*. In the first block, social desirability (unstandardized β = .44, $SE = 0.06$, $t = 8.85$, $p < .001$, $sr = .43$) and past recycling behavior (unstandardized β = .33, $SE = 0.14$, $t = 6.75$, $p < .001$, $sr = .33$) were the significant predictors of intention to recycle. In the second block, the additional variables explained an additional 3.1% of the variance in intention to recycle, $\Delta R^2 = .031$, $\Delta F(3, 271) = 4.56$, $p = .004$. The behavioral privacy yielded a significant main effect on intention to recycle (unstandardized β = .20, $SE = 0.06$, $t = 3.62$, $p < .001$, $sr = .17$). None of the experiment group variables was significant predictors of intention to recycle (control group vs. SDNMs group: unstandardized β = -.03, $SE = 0.16$, $t = -0.47$, $p = .64$, $sr = -.02$; control group vs. EDNMs group: unstandardized β = .03, $SE = 0.16$, $t = 0.50$, $p = .62$, $sr = .02$). In the third block, the interaction terms did not account for a significant amount of additional variance in intention to recycle $\Delta R^2 = .000$, $\Delta F(2, 269) = 0.10$, $p = .91$. Behavioral privacy did not moderate the association between normative messages and intention to recycle. Thus, it was concluded that data were inconsistent with Hypotheses 6a and 6b (see Table 17).

Chapter 7: Discussion

This dissertation was designed to increase understanding of the role of anticipated emotions in normative social influence. The research involved experimental manipulation of a positive anticipated emotion—anticipated pride—in descriptive norms messages and comparison of the effects of emotional descriptive norms messages (EDNMs) on emotions, attitude toward engaging in recycling, behavioral intentions to recycling, and behavioral intentions to talk with the effects of standard descriptive norms messages (SDNMs) with respect to a socially desirable but distal benefit behavior—recycling. As reported in Chapter 6, EDNMs were found to be effective in motivating individuals to engage in recycling as well as talk about the issue with their family through the medium of increased anticipated pride. This finding demonstrates the potential benefits of using EDNMs in the context of pro-social behaviors that are regarded as initially costly but with the potential to yield distal benefits.

The present investigation has expanded on previous research on descriptive norms and anticipated emotions by successfully manipulating anticipated pride appeal within descriptive norms messages—thereby explicating the underlying mechanism of the association between EDNMs and behavioral intentions—and by examining the role of behavioral privacy as a moderator in this process. Previous studies have indicated that normative influence and anticipated emotions are important motivators of certain behaviors, but few have considered the combined effect of descriptive norms and anticipated pride on persuasion. The findings presented here indicate that anticipated pride appeal can be manipulated using verbal and visual cues in descriptive norms messages and thus suggest a means to assess the effects of EDNMs, in the context of distal benefit behaviors, recycling. These results are consistent with those of previous work indicating that normative motivations and the anticipation of emotional outcomes

play important roles in individuals' decisions regarding pro-social behaviors (Cialdini, 2003; Schneider et al., 2017).

Further, while earlier work has made clear the importance of social norms and anticipated emotions in such decision-making, respectively (Cialdini, 2003; Schneider et al., 2017), the current study examined their combined effect on the anticipated emotional outcome, which in turn influences behavioral intention to recycle and behavioral intention to discuss recycling with family members. EDNMs, which contain both descriptive norms information and anticipated pride appeal, influence individuals' intentions both to talk about the focal behavior recycling and to enact it by means of increased levels of anticipated pride relative to SDNMs, which contain only descriptive norms information. Anticipation of emotional outcome is the mechanism underlying EDNMs, enhancing as it does the norm-congruent behavior. As previous literature has demonstrated, SDNMs have informational value regarding what constitutes an efficient behavior. With the addition of anticipated pride appeal, furthermore, EDNMs might gain additional informational value with respect to the positive assessment of the prevalent and efficient behavior (i.e., descriptive norms information). That is, consistent with the characterization of emotion by Baumeister et al. (2007) as a feedback system, anticipated pride provides positive feedback on performance. Descriptive norms information and anticipated pride appeal in a persuasive message thus complement or reinforce one another, thereby motivating norm-congruent behavior.

Inconsistent with Hypothesis 2a-2c, however, EDNMs were found to have no significant positive effect on attitude toward recycling relative to SDNMs. This result may be attributable to the participants in the study already displaying positive outlooks and therefore having little room for upward change in this respect (i.e., a ceiling effect). As seen in Table 10, those in all three

experimental groups showed very positive attitudes toward engagement in recycling. Indeed, of the three groups, participants in the control group, as a baseline measure, showed the most positive attitudes ($M = 6.12$ on a 7-point scale). The implication is that recycling seems to be something about which most people have positive feelings. Yet while prior research found a positive association between high SDNMs and attitudes toward the focal behavior of hand-washing (Lapinski et al., 2013), attitudes toward a target behavior in the current research appear to differ from those found in the earlier work.

Further, according to the findings presented here, behavioral privacy was not a significant moderator of the relationship between EDNMs and SDNMs and the behavioral intention to recycle, which is inconsistent with Hypotheses 6a and 6b. The results indicated that behavioral privacy had a positive direct effect on the intention to recycle such that the more people perceived recycling to be a public behavior, the greater their intention to recycle. An interaction effect of descriptive norms and behavioral privacy on intention, however, was not observed. This result is not surprising given that the moderating effect of behavioral privacy was found to be mixed in prior research (Chung & Lapinski, 2018; Lapinski et al., 2013; Lewis, 2013). The role of behavioral privacy in the relationship between descriptive norms and behavioral intention might be affected by other factors. Future research could explore the moderating role of behavioral privacy in this process considering other factors such as types of social norms or cultural factors.

The findings from this study have additional theoretical and practical implications with respect to both intervention programs based on anticipated emotions and descriptive norms and message design in the context of pro-social behaviors that are often initially costly but provide

distal benefits. The implications for theory advancement as well as for intervention and message design are discussed in the following sections.

THEORETICAL IMPLICATIONS

Turning first to the theoretical implications, much of the research on social norms to date has involved analysis of the cognitive mechanisms of normative processes through testing of the moderating factors in the norm-behavior relationship (Chung & Rimal, 2016). Relatively little work has been done, however, on the emotional mechanisms that help to explicate normative processes and to boost the normative influence. Researchers have noted the need for investigation of the combined effect of normative influence and anticipated emotions (Brewer et al., 2016; Richard et al., 1998), and thus the present study focused on the role of emotions, in particular anticipated emotion, in descriptive norms messages, thereby contributing new insights to the norm-based literature. For example, according to FTNC, the effect of social norms can be more effective to persuade people to engage in norm-congruent behavior when descriptive norms or injunctive norms are salient (Cialdini, 2011; Cialdini et al., 1991; Goldstein & Cialdini, 2011; Kallgren et al., 2000). In the current study, anticipated pride appeal might enhance the salience of descriptive norms information in a message by highlighting the descriptive norms information and providing concrete positive feedback and thus participants perceived the high prevalence of recycling in a more conscious manner. Consequently, the salience of norms effects through anticipating positive emotional outcome leads to positive changes in behavioral intention to recycle and behavioral intention to talk about recycling with family. In addition, communication strategies that use social norms or emotions have been long studied for their effectiveness as persuasion tactics, but the present research has advanced this approach by taking into account the

combined effects of descriptive norms information and anticipated pride appeal as message factors.

Also, many prior studies have examined the role of anticipated emotions in human decision-making and have demonstrated their power to explain behavioral change. Schneider et al. (2017) therefore called for further studies on the role of anticipated emotions in individuals' decision-making about pro-environmental behaviors, and this study does so by showing that anticipating emotional outcomes played an important role in promoting the environmentally-friendly behavior of recycling. Scholars also called for research on the impact of anticipated emotion appeals on pro-environmental behaviors, and this dissertation helps to fill this gap by manipulating the anticipated pride appeal in descriptive norms messages and examining its effect on the promotion of recycling.

Lastly, few studies have examined the role of behavior privacy as an moderator in the association between descriptive norms and behavioral outcomes based on the TNSB framework (Chung & Lapinski, 2018; Lapinski et al., 2013). The current dissertation tested the boundary condition of behavioral privacy in the relationship between exposure to EDNMs and SDNMs and behavioral intention to recycle, respectively. However, the findings from this research did not corroborate the significant role of behavioral privacy as a moderator. Participants across different experiment groups did not show strong perceptual preference of recycling neither as a private nor public behavior (i.e., the mean ranges from 4.55 for the EDNMs group to 4.68 for the control group to 4.74 for the SDNMs group). It might not be a good strategy to attribute recycling to either a private and public behavior. Thus, using other behavioral attributes could be beneficial when the association between descriptive norm and a behavior is examined in the future in terms of recycling (Lapinski et al., 2015; Rimal et al., 2011).

PRACTICAL IMPLICATIONS

The findings from this research have important practical implications for norm-based communication practices intended to increase recycling. Many norm-based environmental campaigns have focused on changing normative beliefs. The approach here, however, was to add an anticipated emotional appeal to the norm-based campaign message in order to create an effective communication strategy. Findings from prior research have demonstrated that anticipated pride, as a future-oriented positive discrete emotion, can be effective in changing behaviors that are associated with delayed benefits and require self-control—specifically, the inhibition of immediate gratifications in the pursuit of long-term goals (Patrick et al., 2009; Schneider et al., 2017; Winterich & Haws, 2011). Also, social norms are regarded as one of the persuasive communication strategies in terms of informing and guiding pro-social behaviors (Cialdini, 1993). The positive effect of EDNMs on behavioral intentions relative to SDNMs, it should be noted, is consistent with the results of prior research (Patrick et al., 2009; Schneider et al., 2017; Winterich & Haws, 2011).

Recycling, therefore, requires individuals to control their motivations, accept initial costs, and seek distal benefits; thus, a social movement is needed to resolve a global issue. Following the lead of previous research (Schneider et al., 2017), the current study used anticipated pride appeal in norm-based communication messages. Based on the findings, communication practitioners and campaign designers are advised to incorporate appropriate future-oriented emotional appeals into their norm-based persuasion strategies so as to enhance their effectiveness. It is important to determine which specific emotions are at play in the normative process given the attributes of a focal behavior in order to develop other persuasive norm-based intervention materials.

Moreover, other sensory information, such as auditory information or haptic perception, could be used to induce anticipated emotions in norm-based communication messages, thereby allowing practitioners to use both traditional (e.g., television) as well as new digital platforms (e.g., social media) to deliver intervention programs. Lastly, the results of the current study could be applied to communication strategies for other pro-social behaviors that require self-control and social-control, such as voting, safe sex, using reusable rather than disposable cups, using public transportation, exercising, healthy eating, etc.

LIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

While the present study has revealed important insights into the relationships among EDNMs, anticipated pride, and behavioral intentions, the limitations of these findings must be acknowledged. To begin with, few researchers have successfully manipulated anticipated pride appeals and the current study reported the successful manipulation of the appeal using both text and imagery. However, future research is needed to corroborate and further contextualize the findings. For instance, although the visual information used to manipulate the anticipated pride appeal was chosen based on the results of pilot tests, there was a difference between the visuals used in the EDNMs and those used in the SDNMs that could be controlled—in particular, the pictures in the EDNMs included people while those in the SDNMs included only objects, namely recycling bins. Thus, in this study, it is possible that participants strongly identified with the people pictured in the EDNMs but were less moved by the objects pictured in the SDNMs (Joffe, 2008). If this was the case, processes other than anticipated pride may have influenced the relationship between the EDNMs and behavioral intentions. In future research, the addition of a measure for message identification might be beneficial to control for the effect on the relationship between EDNMs and behavioral intentions or to link the effect to persuasive impact.

Sensory cues other than visual cues, such as music with varying tempos, could similarly be used to manipulate anticipated emotions (Stewart & Koh, 2017). Also, it is unclear whether text and imagery used to manipulate the anticipated pride appeal jointly produced the manipulation effect or one of them dominantly caused the effect. In future research, not only the independent effect of text and imagery but also the joint effect of text and imagery should be examined to make the cause and effect clear.

Two further limitations deserve more in-depth discussion. First, one size does not fit all in terms of either norm-based communication strategies or anticipated emotion-focused messages (Davis et al., 2012; Eid & Diener, 2001). Rather, prior research has demonstrated that normative influence and anticipated emotional impact are dependent on cultural or individual factors, with the result that people from collectivistic cultural backgrounds or with greater interdependent self-control tend to be more susceptible to normative influence (Bagozzi, Wong, et al., 2000; Park & Levine, 1999; White & Simpson, 2013) and that people with a greater tendency to consider future consequences tend to be strongly affected by anticipated emotion-focused messages (Martinez, 2014). Considering the combined impact of descriptive norms and anticipated emotions on persuasion processes, researchers should explore other factors affecting the direction and/or strength of the relationship between EDNMs and behaviors. Schneider et al. (2017) suggested that anticipating emotional outcomes may be a critical motivator when it comes to enacting desirable behaviors on behalf of others, in particular in cultures that place a high value on caring for others. In light of the findings regarding differences in normative influence as well as emotional experiences between collectivistic and individualistic cultures, then, future research should take into account cultural factors in delineating the boundary conditions for the persuasive effect of EDNMs in the context of pro-social behaviors.

Second, the current study used only information relating to static descriptive norms. Future studies could further evaluate the impact of messages that emphasize trends in terms of change (e.g., information relating to dynamic descriptive norms or trending descriptive norms) or approval/disapproval of a behavioral enactment (e.g., information relating to injunctive norms) and consider the actual changes in the prevalence of or approval accorded to a focal behavior so as to enhance the believability and effectiveness of the message (Kormos et al., 2015; Mortensen et al., 2017; Sparkman & Walton, 2017). Thus, for example, a persuasive message with trending descriptive norms information could be more effective when a focal behavior is not yet popular (Mortensen et al., 2017). So also, in light of the potential utility of anticipated emotions demonstrated in this study, researchers should apply both negative and positive anticipated emotions (other than anticipated pride) to various types of social norm-based communication strategies with consideration of the attributes of a focal behavior. Christensen, Rothgerber, Wood, and Matz (2004), for example, argued that injunctive norms would fit better with emotional components than would descriptive norms. Future research could, accordingly, assess the combined effect of injunctive norms information and anticipated pride in the context of recycling and compare the effects of EDNMs and emotional injunctive norms messages (EINJMs). Furthermore, since this study used only an anticipated emotional appeal—anticipated pride—in the normative message, subsequent research could consider the effect of mixed anticipated emotional appeals in this and other types of messages (e.g., narrative) in order to explore how emotional flow influences persuasion processes and outcomes (Carrera, Muñoz, & Caballero, 2010; Nabi, 2015).

A further limitation is that, although the effort was made here to overcome the inherent weakness of the one-shot message exposure design by using a sequence of two similar messages,

the results do not speak to the long-term performance of the proposed persuasion effects. Other approaches, such as longitudinal research designs that test the enduring effects of EDNMs or field experimental designs in naturally occurring environments, therefore, merit future research. Also, noteworthy is the fact that the sample in this study is not generalizable to the U.S. population as a whole; thus, only one of the sample's characteristics, gender, mirrored the national distribution, so a more representative sample would yield more robust results. Lastly, in the current research, interpersonal communication is regarded as an outcome assessing the effectiveness of social norms communication strategies. According to Southwell and Yzer (2009), it is important to understand when and why interpersonal communication plays a certain role such as a moderator, a mediator, or an outcome (ROI) in persuasion process. Thus, in future research, the multifaceted roles of interpersonal communication in the social norms communication strategies should be further examined. Also, measuring not only the frequency of interpersonal communication but also the nature of interpersonal communication (valence, content, and structure) will be beneficial to understand when and why interpersonal communication plays a particular role in future research.

Chapter 8: Conclusion

Ultimately, what makes research findings of interest is that they help us understand everyday

life. That understanding, however, comes from theory or analysis of mechanism; it is not a

matter of `generalizing' the findings themselves.

(Mook, 1983)

Such environmental problems as those involving air, soil, and water pollution, food

waste, climate change, global warming, and disposable plastics occur globally. Individuals often

acknowledge the need to display pro-environmental behaviors to resolve these problems, but

they do not always follow through owing to the uncertainty and ambiguity that characterize distal

benefits. For behavioral changes to occur and the long-term goals to be realized, both individual

and collective action are required. It is, therefore, imperative that efforts to bring about such

change make use of communication strategies that address both individual and collective efforts.

This study, then, has examined two important motivators of pro-social behaviors, namely

normative influence and anticipation of emotional outcomes. The findings indicate that

emotional descriptive norms message (EDNM) enhances norm-congruent behavior relative to

standard descriptive norms message (SDNM). This result demonstrates the power of EDNMs as

a communication strategy to catalyze social change as well as to bolster self-control in the

context of pro-social behaviors and, more importantly, reveals the theoretical mechanism behind

the proposed persuasion effect. It is clear, in sum, that the combination of normative influence

and anticipation of emotional outcomes plays an important role in informing and persuading

individuals.

Appendices

Appendix A: Tables and Figures

Table 1.
Results from Pilot Test 1
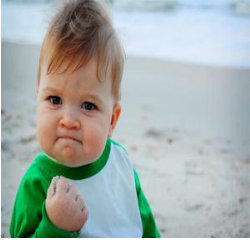
	M	SD	α
	5.20	1.42	.98
	5.13	1.52	.97
	4.88	1.49	.97
	4.84	1.42	.97
	4.83	1.55	.96
	4.72	1.46	.97

Table 2.
Results from Pilot Test 2

		Mean (SD)	α
Emotional Descriptive Norms Message 1 (EDNM 1) –Children		5.56 (1.27)[a]	.98
Emotional Descriptive Norms Message 2 (EDNM 2) – A woman		5.59 (1.29)[a]	.98
Emotional Descriptive Norms Message 3 (EDNM 3) – Flag of the United States		4.77 (1.60)[b]	.98
Standard Descriptive Norms Message 1 (SDNM 1) –Recycling bins in a park		4.41 (1.65)[b]	.96
Standard Descriptive Norms Message 2 (SDNM 2) –Colored recycling bins		4.56 (1.62)[b]	.97

Table 3.
Results from Pilot Test 3

	EDNM1 (*n* = 15)	EDNM2 (*n* = 16)	SDNM1 (*n* = 15)	SDNM2 (*n* = 14)	F (3, 56)	*p*
	M (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)		
Descriptive Norms Information	5.57 (1.46)	5.55 (1.25)	5.70 (1.33)	5.52 (1.12)	0.057	.98
Injunctive Norms Information	5.55 (1.13)	5.05 (1.29)	5.27 (1.34)	4.77 (0.74)	1.198	.32
Social Prevalence	5.55 (1.62)	5.48 (1.25)	5.72 (1.40)	5.63 (1.07)	0.084	.97
Social Approval	5.42 (1.39)	5.46 (1.29)	5.56 (1.13)	4.98 (1.17)	0.608	.61
Believability	5.07 (1.52)	4.99 (1.36)	5.00 (1.03)	5.02 (1.26)	0.013	.998

Table 4.
Sample Characteristics

	Sample (*N*)
Total Participants	280
Mean Age	*41.66 (SD = 16.16)*
Female	146
Race	
White	220
Black	28
Asian	4
Hispanic	19
Multiracial	3
Native American	2
Pacific Islander	1
Education	
Some high school without a diploma	12
High school with a diploma or the equivalent	62
Some college credit without a degree	62
Trade/technical/vocational training	10
2-year college degree	45
4-year college degree (e.g., BA/BS)	62
Professional degree	2
Master's degree	21
Doctorate degree	4
Income	
Below $20,000	57
$20,000 - $29,999	33
$30,000 - $39,999	37
$40,000 - $49,999	30
$50,000 - $59,999	33
$60,000 - $69,999	24
$70,000 - $79,999	28
$80,000 - $89,999	11
$90,000 or more	27

Table 5.
Main Experiment Design

Experimental Groups	Conditions	First Message	Second Message
EDNMs Group	Condition 1	EDNM1	EDNM2
	Condition 2	EDNM2	EDNM1
SDNMs Group	Condition 3	SDNM 1	SDNM 2
	Condition 4	SDNM 2	SDNM 1
Control Group	Condition 5	No Message	No Message
	Condition 6	No Message	No Message

Table 6.
Scale Reliability

Scale	Mean (SD)	α	SI α	Total # of Items	Total Items Retained	Dropped Item(s)
Anticipated Pride	5.41 (1.36)	.96	.97	9	9	-
Attitude toward a target behavior	6.00 (1.51)	.98	.98	8	8	
Behavioral intention to talk	5.01 (1.70)	.97	.97	4	4	-
Behavioral intention to engage in a target behavior	5.56 (1.40)	.91	.91	3	3	-
Behavioral privacy 1	5.31 (1.59)	.83	.84	3	3	-
Behavioral privacy 2	4.66 (1.37)	.85	.86	4	4	-
Perceived descriptive normative content in the messages	5.51 (1.33)	.94	.94	4	4	-
Perceived injunctive normative content in the messages	5.25 (1.17)	.79	.82	4	4	-
Perceived social prevalence of recycling in the U.S.	4.93 (1.64)	.97	.97	4	4	-
Perceived social approval of recycling in the U.S.	4.81 (1.30)	.85	.85	4	4	-
New Environmental Paradigm (NEP) scale	4.84 (0.86)	.77	.78	12	12	-
Message believability	5.71 (1.37)	.97	.98	10	10	-
Social desirability	5.41 (1.11)	.76	.78	6	3	Items 4, 5, 6
Self-monitoring	3.80 (1.18)	.78	.76	7	6	Item 2

Table 7.

Results for T-tests to Test the Order Effect of Emotional Descriptive Norms Messages (EDNMs)
Presentation

	Condition 1 (n = 43) M (SD)	Condition 2 (n = 42) M (SD)	t (83)	p	η²
Age	39.21 (16.18)	39.33 (14.88)	-0.04	.97	
Anticipated Pride	5.57 (1.28)	5.49 (1.48)	0.27	.79	
Attitude toward a target behavior	5.90 (1.53)	5.74 (1.81)	0.44	.66	
Behavioral intention to talk	5.01 (1.64)	5.33 (1.77)	-0.89	.38	
Behavioral intention to engage in a target behavior	5.58 (1.37)	5.56 (1.39)	0.06	.95	
Behavioral privacy 1	5.35 (1.51)	5.29 (1.51)	0.19	.85	
Behavioral privacy 2	4.35 (1.34)	4.75 (1.51)	-1.30	.20	
Perceived descriptive normative content in the messages	5.13 (1.44)	5.58 (1.25)	-1.54	.13	
Perceived injunctive normative content in the messages	4.97 (1.17)	5.21 (1.11)	-0.98	.33	
Perceived social prevalence of recycling in the U.S.	4.94 (1.53)	5.51 (1.28)	-1.88	.06	
Perceived social approval of recycling in the U.S.	4.74 (1.36)	4.79 (1.11)	-0.15	.88	
New Environmental Paradigm (NEP) scale	4.90 (0.94)	4.91 (0.86)	-0.06	.95	
Message believability	5.41 (1.17)	5.72 (1.44)	-1.07	.29	
Social desirability	5.26 (1.23)	5.55 (0.98)	-1.21	.23	
Self-monitoring	3.69 (1.27)	4.13 (1.02)	-1.75	.08	

* $p < .05$, ** $p \leq .001$, $\alpha < .05$ (2-tailed).

Note. In the condition 1, participants viewed EDNM 1 first and then EDNM 2 whereas in the condition 2, participants viewed EDNM 2 first and then EDNM 1.

Table 8.

Results for T-tests to Test the Order Effect of Standard Descriptive Norms Messages (SDNMs) Presentation

	Condition 3 (n = 38)	Condition 4 (n = 42)	t (78)	p	η^2
	M (SD)	M (SD)			
Age	46.13 (17.35)	40.86 (16.44)	1.40	.17	
Anticipated Pride	5.50 (1.13)	5.07 (1.72)	t(71.48)=1.33	.19	
Attitude toward a target behavior	6.11 (1.23)	5.99 (1.41)	0.40	.69	
Behavioral intention to talk	5.24 (1.63)	5.08 (1.77)	0.42	.68	
Behavioral intention to engage in a target behavior	5.66 (1.44)	5.44 (1.49)	0.65	.52	
Behavioral privacy 1	5.04 (1.72)	5.40 (1.87)	-0.90	.37	
Behavioral privacy 2	5.01 (1.13)	4.49 (1.33)	1.87	.07	
Perceived descriptive normative content in the messages	5.86 (1.11)	5.59 (1.25)	1.03	.31	
Perceived injunctive normative content in the messages	5.74 (0.83)	5.20 (1.18)	2.32	.02*	
Perceived social prevalence of recycling in the U.S.	5.95 (1.03)	5.78 (1.37)	t(75.58)=0.65	.52	
Perceived social approval of recycling in the U.S.	5.51 (1.14)	5.09 (1.21)	1.59	.12	
New Environmental Paradigm (NEP) scale	4.83 (0.88)	4.64 (0.64)	1.14	.26	
Message believability	5.93 (1.38)	5.85 (1.29)	0.26	.80	
Social desirability	5.49 (1.07)	5.47 (0.10)	0.10	.92	
Self-monitoring	3.85 (1.19)	3.79 (1.30)	0.22	.83	

* *p* < .05, ** *p* ≤ .001, α < .05 (2-tailed).

Note. In the condition 3, participants viewed SDNM 1 first and then SDNM 2 whereas in the condition 4, participants viewed SDNM 2 first and then SDNM 1.

Levene's test for equality of variances violated in the tests for anticipated pride and perceived social prevalence of recycling in the U.S. Thus, the t-test values for anticipated pride and perceived social prevalence of recycling in the U.S. were reported when equal variances not assumed.

Table 9.
Results for T-tests to Test the Order Effect of in Control Conditions

	Condition 5 (n = 55) M (SD)	Condition 6 (n = 57) M (SD)	t (83)	p	η²
Age	41.62 (16.48)	43.05 (15.97)	-0.47	.64	
Anticipated Pride	5.43 (1.47)	5.33 (1.01)	t(95.44)=0.43	.67	
Attitude toward a target behavior	6.24 (1.51)	6.01 (1.38)	0.84	.40	
Behavioral intention to talk	4.86 (1.78)	4.74 (1.57)	0.39	.70	
Behavioral intention to engage in a target behavior	5.68 (1.36)	5.48 (1.32)	0.79	.43	
Behavioral privacy 1	5.52 (1.47)	5.22 (1.44)	1.11	.27	
Behavioral privacy 2	4.73 (1.50)	4.64 (1.18)	0.34	.73	
Perceived social prevalence of recycling in the U.S.	4.12 (1.61)	4.01 (1.56)	0.37	.72	
Perceived social approval of recycling in the U.S.	4.68 (1.33)	4.39 (1.26)	1.15	.25	
New Environmental Paradigm (NEP) scale	5.04 (0.89)	4.76 (0.85)	1.70	.09	
Social desirability	5.52 (1.13)	5.32 (1.01)	1.02	.31	
Self-monitoring	3.66 (1.12)	3.72 (1.15)	-0.29	.78	

* $p < .05$, ** $p \leq .001$, $\alpha < .05$ (2-tailed).

Note. Participants in the condition 5 and condition 6 did not view any messages and completed the same online questionnaire.

Levene's test for equality of variances violated in the test for anticipated pride. Thus, the t-test value for anticipated pride was reported when equal variances not assumed.

Table 10.
Means and Standard Deviations across Three Experimental Groups

	Experimental Group 1 - EDNMs (*n* = 85)	Experimental Group 2 - SDNMs (*n* = 80)	Control Group (*n* = 112)
	M (SD)	*M (SD)*	*M (SD)*
Age	39.27 (15.46)	43.36 (16.98)	42.35 (16.17)
Anticipated Pride	5.53 (1.38)	5.28 (1.48)	5.38 (1.25)
Attitude toward a target behavior	5.82 (1.67)	6.05 (1.33)	6.12 (1.44)
Behavioral intention to talk	5.17 (1.70)	5.15 (1.69)	4.80 (1.67)
Behavioral intention to engage in a target behavior	5.57 (1.37)	5.55 (1.46)	5.58 (1.34)
Behavioral privacy 1	5.32 (1.50)	5.23 (1.80)	5.37 (1.45)
Behavioral privacy 2	4.55 (1.43)	4.74 (1.26)	4.68 (1.34)
Perceived descriptive normative content in the messages	5.35 (1.36)[a]	5.72 (1.19)[a]	-
Perceived injunctive normative content in the messages*	5.09 (1.14)[a]	5.46 (1.06)[b]	-
Perceived social prevalence of recycling in the U.S.*	5.22 (1.43)[a]	5.86 (1.21)[b]	4.06 (1.58)[c]
Perceived social approval of recycling in the U.S.*	4.76 (1.24)[a]	5.29 (1.19)[b]	4.53 (1.30)[a]
New Environmental Paradigm (NEP) scale	4.91 (0.90)	4.73 (0.77)	4.89 (0.88)
Message believability	5.56 (1.31)	5.89 (1.33)	-
Social desirability	5.40 (1.12)	5.48 (1.03)	5.42 (1.07)
Self-monitoring	3.91 (1.17)	3.82 (1.24)	3.69 (1.13)

* $p < .05$

Table 11.
Correlation among Variables

	Anticipated Pride	Attitude toward Behavior	Intention to Talk	Intention to Recycle	Behavioral Privacy 1	Behavioral Privacy 2
Attitude toward Behavior	.338**	-				
Intention to Talk	.449**	.263**	-			
Intention to Recycle	.426**	.405**	.665**	-		
Behavioral Privacy 1	.409**	.344**	.387**	.434**	-	
Behavioral Privacy 2	.297**	.221**	.465**	.437**	.347**	-
Descriptive Norm Information	.341**	.443**	.352**	.446**	.233**	.331**
Injunctive Norm Information	.444**	.340**	.514**	.500**	.331**	.519**
Social Prevalence	.198**	.114	.366**	.311**	.116	.319**
Social Approval	.304**	.160**	.458**	.369**	.201**	.519**
NEP	.182**	.242**	.205**	.359**	.170**	.153*
Believability	.459**	.477**	.552**	.439**	.436**	.486**
Social Desirability	.343**	.337**	.461**	.494**	.265**	.444**
Self-monitoring	.064	.027	.245**	.105	.029	.244**
Age	.047	.107	-.055	.074	-.010	.034
Education	.078	.044	.064	.171**	.024	.029

$* p < .05, ** p \leq .001, \alpha < .05$ (2-tailed).

Table 11. (cont'd)

	Anticipated Pride	Attitude toward Behavior	Intention to Talk	Intention to Recycle	Behavioral Privacy 1	Behavioral Privacy 2
Income	.064	.069	.045	.163**	.019	.015
Sex	.090	.109	.092	.041	.045	-.098
Past Behavior	.278**	.076	.349**	.409**	.232**	.281**
Experimental Conditions	.044	-.085	.094	-.002	-.015	-.039

* $p < .05$, ** $p \leq .001$, $\alpha < .05$ (2-tailed).

Note. Experimental conditions were coded as 0=control, 1=SDNMs, and 2=EDNMs

Table 11. (cont'd)

	Descriptive Norm Information	Injunctive Norm Information	Social Prevalence	Social Approval	NEP	Believability	Social Desirability
Injunctive Norm Information	.651**	-					
Social Prevalence	.740**	.561**	-				
Social Approval	.476**	.734**	.559**	-			
NEP	.337**	.307**	.113	.192**	-		
Believability	.531**	.553**	.432**	.520**	.197*	-	
Social Desirability	.516**	.463**	.415**	.506**	.274**	.458**	-
Self-monitoring	.113	.250**	.245**	.398**	-.082	.154*	.207**
Age	.178*	.161*	.060	.027	.058	.194*	.083
Education	.120	.058	.008	-.017	.196**	-.022	.066
Income	.138	.010	.004	-.069	.050	-.032	.041
Sex	.105	.041	-.004	.065	.113	.063	.111
Past Behavior	.110	.222**	.173**	.207**	.011	.236**	.173**
Experimental Conditions	-.143	-.167*	.325**	.092	-.001	-.124	-.004

* $p < .05$, ** $p \leq .001$, $\alpha < .05$ (2-tailed).

Table 11. (cont'd)

	Self-monitoring	Age	Education	Income	Sex	Past Behavior
Age	-.172**	-				
Education	-.072	.221**	-			
Income	-.116	.117	.440**	-		
Sex	-.001	-.125*	.013	.005	-	
Past Behavior	.034	.068	.121*	.122*	-.082	-
Experimental Conditions	.078	-.074	-.036	-.132*	-.007	-.047

* $p < .05$, ** $p \leq .001$, $\alpha < .05$ (2-tailed).

Table 12.

A Summary of Each Hypothesis and Its Results

Hypothesis	*Result*	*p*
H1a: Participants who view messages that include both descriptive norms information and anticipated pride appeal (i.e., emotional descriptive norms messages) will report greater feelings of anticipated pride than those who do not view any messages (i.e., a control condition).	Inconsistent with data	$p > .5$
H1b: Participants who view messages that include only descriptive norms information (i.e., standard descriptive norms messages) will report greater feelings of anticipated pride than those who do not view any messages (i.e., a control condition).	Inconsistent with data	$p > .5$
H1c: Participants who view messages that include both descriptive norms information and anticipated pride appeal (i.e., emotional descriptive norms messages) will report greater feelings of anticipated pride than those who view messages that include only descriptive norms information (i.e., standard descriptive norms messages).	Consistent with data	$p < .5$
H2a: Participants who view messages that include both descriptive norms information and anticipated pride appeal (i.e., emotional descriptive norms messages) will have more positive attitude toward the target behavior than those who do not view any messages (i.e., a control group).	Inconsistent with data	$p > .5$
H2b: Participants who view messages that include only descriptive norms information (i.e., standard descriptive norms messages) will have more positive attitude toward the target behavior than those who do not view any messages (i.e., a control group).	Inconsistent with data	$p > .5$
H2c: Participants who view messages that include both descriptive norms information and anticipated pride appeal (i.e., emotional descriptive norms messages) will have more positive attitude toward the target behavior than those who view messages that include only descriptive norms information (i.e., standard descriptive norms messages).	Inconsistent with data	$p > .5$
H3a: Participants who view messages that include both descriptive norms information and anticipated pride appeal (i.e., emotional descriptive norms messages) will be more likely to intend to recycle than those who do not view any messages (i.e., a control group).	Inconsistent with data	$p > .5$

Table 12. (cont'd)

Hypothesis	Result	p
H3b: Participants who view messages that include only descriptive norms information (i.e., standard descriptive norms messages) will be more likely to intend to recycle than those who do not view any messages (i.e., a control group).	Inconsistent with data	$p > .5$
H3c: Participants who view messages that include both descriptive norms information and anticipated pride appeal (i.e., emotional descriptive norms messages) will be more likely to intend to recycle than those who view messages that include only descriptive norms information (i.e., standard descriptive norms messages).	Inconsistent with data	$p > .5$
H4a: Participants who view messages that include both descriptive norms information and anticipated pride appeal (i.e., emotional descriptive norms messages) will be more likely to intend to talk about recycling with their family than those who do not view any messages (i.e., a control group).	Inconsistent with data	$p > .5$
H4b: Participants who view messages that include only descriptive norms information (i.e., standard descriptive norms messages) will be more likely to intend to talk about recycling with their family than those who do not view any messages (i.e., a control group).	Inconsistent with data	$p > .5$
H4c: Participants who view messages that include both descriptive norms information and anticipated pride appeal (i.e., emotional descriptive norms messages) will be more likely to intend to talk about recycling with their family than those view messages that include only descriptive norms information (i.e., standard descriptive norms messages).	Inconsistent with data	$p > .5$
H5a: The effects of emotional descriptive norms messages (EDNMs) on behavioral intent to recycle will be mediated by anticipated pride.	Consistent with data	$p < .5$
H5b: The effects of emotional descriptive norms messages (EDNMs) on behavioral intent to talk about recycling with their family will be mediated by anticipated pride.	Consistent with data	$p < .5$
H6a: The relationship between standard descriptive norms messages (SDNMs) and intentions to recycle will increase in magnitude as participants perceive the recycling as a public behavior more than as a private behavior.	Inconsistent with data	$p > .5$

Table 12. (cont'd)

Hypothesis	Result	p
H6b: The relationship between emotional descriptive norms messages (EDNMs) and intentions to recycle will increase in magnitude as participants perceive the recycling as a public behavior more than as a private behavior.	Inconsistent with data	*p > .5*

Table 13.
Hierarchical Regression Results for Anticipated Pride (H1)

	Across 3 Experimental Groups				Between 2 Treatment Groups			
	B	*SE*	β	*t*	*B*	*SE*	β	*t*
First Block								
Believability	-	-	-	-	.50	.08	.46	6.60**
					$F(1, 163) = 43.54**, p < .001,$ adj $R^2 = .206$			
Second Block								
SDNM	-.10	.20	-.03	-0.50	-	-	-	-
EDNM	.16	.20	.05	0.79	.42	.20	.15	2.14*
	$F(2, 274) = 0.75, p = .48,$ adj $R^2 = -.002$				$F_c(1, 162) = 4.59*, p = .03,$ $R^2_c = .022$			

* $p < .05,$ ** $p \leq .001.$
SDNM = Standard Descriptive Norms Message.
EDNM = Emotional Descriptive Norms Message.
 F_c = F Change value; $R^2_{c:}$ = R^2 Change value.

To test the hypothesis across three experimental groups, the three experimental groups were coded, with the control group as 0 (the reference group) and the other group as 1 to create two dummy variables, each of which represented each treatment group compared to the control group.

To test the hypothesis between two treatment groups, the two treatment groups were dummy-coded, with SDNMs group coded as 0 and EDNMs group coded as 1.

Table 14.

Hierarchical Regression Results for Attitude toward Engaging in Recycling (H2)

	Across 3 Experimental Groups				Between 2 Treatment Groups			
	B	SE	β	t	B	SE	β	t
First Block								
Social Desirability	.47	.08	.34	5.93**	.21	.11	.18	1.91
Believability	-	-	-	-	.47	.09	.41	5.34**
	$F(1, 275) = 35.17^{**}, p < .001,$ *adj* $R^2 = .11$				$F(2, 162) = 26.22^{**}, p < .001,$ *adj* $R^2 = .235$			
Second Block								
SDNM	-.10	.21	-.03	-0.50	-	-	-	-
EDNM	.30	.20	-.09	-1.49	-.07	.21	-.02	-0.32
	$F_c(2, 273) = 1.12, p = .33,$ $R^2_c = .007$				$F_c(1, 161) = 0.10, p = .75,$ $R^2_c = .000$			

$* p < .05, ** p \leq .001.$
SDNM = Standard Descriptive Norms Message.
EDNM = Emotional Descriptive Norms Message.
F_c = F Change value; $R^2_c = R^2$ Change value.

To test the hypothesis across three experimental groups, the three experimental groups were coded, with the control group as 0 (the reference group) and the other group as 1 to create two dummy variables, each of which represented each treatment group compared to the control group.

To test the hypothesis between two treatment groups, the two treatment groups were dummy-coded, with SDNMs group coded as 0 and EDNMs group coded as 1.

Table 15.
Hierarchical Regression Results for Intention to Recycle (H3)

	Across 3 Experimental Groups				Between 2 Treatment Groups			
	B	*SE*	β	*t*	*B*	*SE*	β	*t*
First Block								
Social Desirability	.56	.06	.44	8.85**	.37	.09	.28	3.94**
Past Behavior	.94	.14	.33	6.75**	.92	.19	.32	4.87**
Believability	-	-	-	-	.25	.08	.24	3.23*
	$F(2, 274) = 92.44**, p < .001,$ *adj* $R^2 = .35$				$F(3, 161) = 29.12**, p < .001,$ *adj* $R^2 = .34$			
Second Block								
SDNM	-.07	.16	-.02	-0.43	-	-	-	-
EDNM	.06	.16	.02	0.37	.20	.18	.07	1.09
	$F_c(2, 272) = 0.28, p = .76,$ $R^2_c = .001$				$F_c(1, 160) = 1.20, p = .28,$ $R^2_c = .005$			

$* p < .05, ** p \leq .001.$
SDNM = Standard Descriptive Norms Message.
EDNM = Emotional Descriptive Norms Message.
F_c = F Change value; $R^2_{c:}$ = R^2 Change value.

To test the hypothesis across three experimental groups, the three experimental groups were coded, with the control group as 0 (the reference group) and the other group as 1 to create two dummy variables, each of which represented each treatment group compared to the control group.

To test the hypothesis between two treatment groups, the two treatment groups were dummy-coded, with SDNMs group coded as 0 and EDNMs group coded as 1.

Prior recycling behavior was dummy-coded, with a non-recycler coded as 0 and a recycler coded as 1.

Table 16.
Hierarchical Regression Results for Intention to Talk (H4)

	Across 3 Experimental Groups				Between 2 Treatment Groups			
	B	*SE*	β	*t*	*B*	*SE*	β	*t*
First Block								
Social Desirability	.49	.09	.31	5.18**	.25	.12	.16	2.10*
Social Approval	.40	.08	.30	5.09**	.23	.11	.17	2.19*
Believability	-	-	-	-	.50	.10	.39	5.08**
	$F(2, 274) = 53.37**, p < .001,$ *adj* $R^2 = .28$				$F(3, 161) = 30.04**, p < .001,$ *adj* $R^2 = .347$			
Second Block								
SDNM	.02	.22	.01	0.09	-	-	-	-
EDNM	.28	.21	.08	1.36	.34	.22	.10	1.55
	$F_c(2, 272) = 1.07, p = .34,$ $R^2_c = .006$				$F_c(1, 160) = 2.39, p = .12,$ $R^2_c = .009$			

$* p < .05, ** p \leq .001.$
SDNM = Standard Descriptive Norms Message.
EDNM = Emotional Descriptive Norms Message.
F_c = F Change value; $R^2_{c:}$ = R^2 Change value.

To test the hypothesis across three experimental groups, the three experimental groups were coded, with the control group as 0 (the reference group) and the other group as 1 to create two dummy variables, each of which represented each treatment group compared to the control group.

To test the hypothesis between two treatment groups, the two treatment groups were dummy-coded, with SDNMs group coded as 0 and EDNMs group coded as 1.

Table 17.

Hierarchical Regression results for intention to recycle with behavioral privacy as a moderator (H6)

	B	SE	β	t
First Block				
Social Desirability	.56	.06	.44	8.85**
Past Behavior	.94	.14	.33	6.75**
$F(2, 274) = 74.45**, p < .001, adj\ R^2 = .35$				
Second Block				
SDNM	-.08	.16	-.03	-.47
EDNM	.08	.16	.03	.50
Behavioral Privacy	.20	.06	.20	3.62**
$F_c(3, 271) = 4.56*, p = .004, R^2_c = .031$				
Third Block				
SDNM x BP	-.03	.13	-.04	-0.20
EDNM x BP	-.05	.11	-.08	-0.44
$F_c(2, 269) = 0.10, p = .91, R^2_c = .000$				

$* p < .05, ** p \leq .001$.
SDNM = Standard Descriptive Norms Message.
EDNM = Emotional Descriptive Norms Message.
BP = Behavioral Privacy.
$\quad F_c$ = F Change value; R^2_c = R^2 Change value.

To test the hypothesis across three experimental groups, the three experimental groups were coded, with the control group as 0 (the reference group) and the other group as 1 to create two dummy variables, each of which represented each treatment group compared to the control group.

To test the hypothesis between two treatment groups, the two treatment groups were dummy-coded, with SDNMs group coded as 0 and EDNMs group coded as 1.

Prior recycling behavior was dummy-coded, with a non-recycler coded as 0 and a recycler coded as 1.

H4a
$R^2=.37$; indirect effect =.19 [.04-.4]

.48*   Anticipated   .40**
              Pride

EDNMs   Intention to
                                         Talk

                    .15
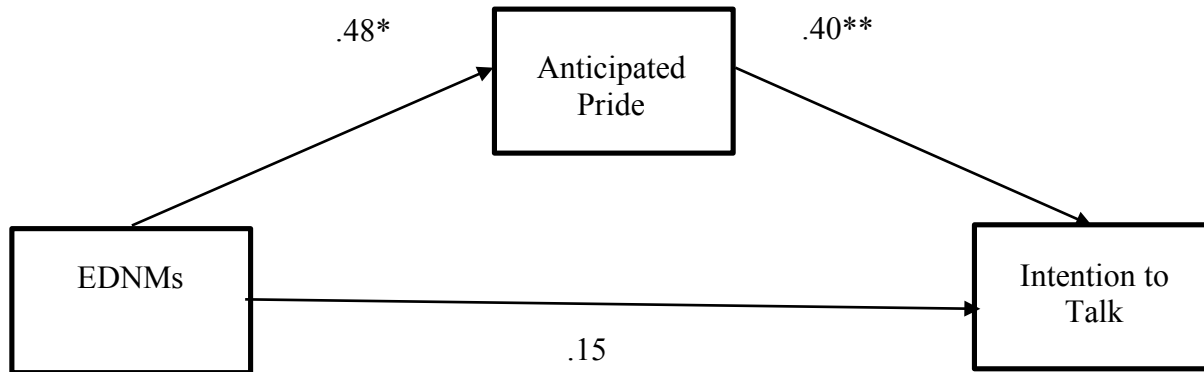
H4b
$R^2=.36$; indirect effect =.11 [.01-.30]

.44*   Anticipated   .26**
              Pride

EDNMs   Intention to
                                         Recycle

                    .08
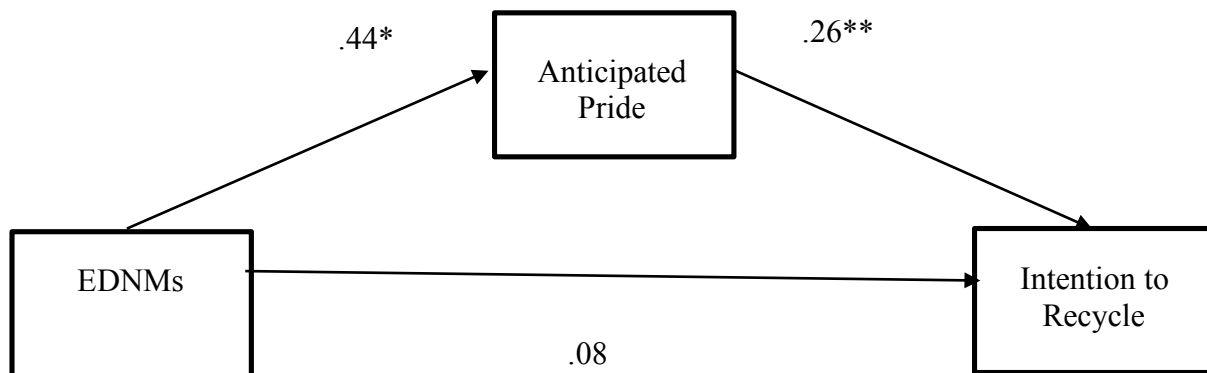
Figure 1. Causal models illustrating the mediated effects of emotional descriptive norms messages on behavioral intentions through anticipated pride.
$* p < .05, ** p \leq .001$

Covariates include social desirability past behavior, and message believability.

Appendix B: Stimuli

In 2017, **more than 80**% of people in the U.S. recycled the materials they used.

Your family will be **proud** of you
if you recycle.

Benefits of Recycling

- Reduces the amount of waste sent to landfills and incinerators
- Conserves natural resources such as timber, water and minerals
- Increases economic security by tapping a domestic source of materials
- Prevents pollution by reducing the need to collect new raw materials
- Saves energy
- Supports manufacturing and conserves valuable resources
- Helps create jobs in the recycling and manufacturing industries

PLEASE Recycle

In 2017, more than 80% of people in the U.S. recycled the materials they used.

Your family will be proud of you if you recycle.

Benefits of Recycling

- Reduces the amount of waste sent to landfills and incinerators
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- Saves energy
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PLEASE Recycle

In 2017, more than **80**% of people in the U.S. recycled the materials they used.

Benefits of Recycling

- Reduces the amount of waste sent to landfills and incinerators
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- Increases economic security by tapping a domestic source of materials
- Prevents pollution by reducing the need to collect new raw materials
- Saves energy
- Supports manufacturing and conserves valuable resources
- Helps create jobs in the recycling and manufacturing industries

PLEASE Recycle

In 2017, more than **80**% of people in the U.S. recycled the materials they used.

Benefits of Recycling

- Reduces the amount of waste sent to landfills and incinerators
- Conserves natural resources such as timber, water and minerals
- Increases economic security by tapping a domestic source of materials
- Prevents pollution by reducing the need to collect new raw materials
- Saves energy
- Supports manufacturing and conserves valuable resources
- Helps create jobs in the recycling and manufacturing industries

PLEASE
Recycle

Appendix C: Questionnaire Items for Pilot Studies

Pilot Test 1

Please answer the following question to the best of your ability. There is no right or wrong answer.

After viewing the picture, to what extent do you have the following emotions?

After viewing the picture, I felt (like I was or I had)…

1	Proud	not at all	1	2	3	4	5	very much
					6	7		
2	Accomplished	not at all	1	2	3	4	5	very much
					6	7		
3	Confident	not at all	1	2	3	4	5	very much
					6	7		
4	Satisfied	not at all	1	2	3	4	5	very much
					6	7		
5	Worthwhile	not at all	1	2	3	4	5	very much
					6	7		
6	Achieving	not at all	1	2	3	4	5	very much
					6	7		
7	fulfilled	not at all	1	2	3	4	5	very much
					6	7		
8	Productive	not at all	1	2	3	4	5	very much
					6	7		

Pilot Test 2

Please answer the following question to the best of your ability. There is no right or wrong answer.

After viewing the message, to what extent do you have the following emotions?

After viewing the message, I felt (like I was or I had)…

1	Proud	not at all	1	2	3	4	5	very much
					6	7		
2	Accomplished	not at all	1	2	3	4	5	very much
					6	7		
3	Confident	not at all	1	2	3	4	5	very much
					6	7		
4	Satisfied	not at all	1	2	3	4	5	very much
					6	7		
5	Worthwhile	not at all	1	2	3	4	5	very much
					6	7		
6	Achieving	not at all	1	2	3	4	5	very much
					6	7		
7	fulfilled	not at all	1	2	3	4	5	very much
					6	7		
8	Productive	not at all	1	2	3	4	5	very much
					6	7		

Pilot Test 3

Perceived descriptive norms contents in the message

Please indicate how much you agree with the following statements.

1. The information presented in the message indicates that most people in the U.S. recycle
    materials they used.
       Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
2. Clearly, the message shows that many people in the U.S. are recycling materials they used.
       Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
3. The message states that many people in the U.S. recycle materials they used.
       Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
4. From the information in the message, it seems that there are many people in the U.S. who
    recycle materials they used.
       Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

Perceived injunctive norms contents in the message

Please indicate how much you agree with the following statements.

1. Based on the message I saw, I feel like people in the U.S. would think less of me if I don't
    recycle materials I used.
       Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
2. It is clear from this message that people in the U.S. believe that recycling is important.
       Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
3. The message shows people in the U.S. approve of recycling.
       Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
4. This message shows that people in the U.S. would respect me more if I recycle materials I
    used.
       Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

Perceived social prevalence of recycling in the U.S.

Please indicate how much you agree with the following statements.

1. More than half of the people in the U.S. engage in recycling.

Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
2. Most people in the U.S. engage in recycling.
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
3. More than 50% of the people in the U.S. engage in recycling.
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
4. The majority of people in the U.S. is recycling.
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

Perceived social approval of recycling in the U.S.

Please indicate how much you agree with the following statements.

1. Recycling is something that most people in the U.S. think I should do.
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
2. People in the U.S. think I should do endorse recycling.
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
3. People in the U.S. may judge me based on whether or not I endorse recycling.
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
4. I feel like people in the U.S. would think less of me if I did not recycle materials I used.   Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

Message Believability
Please click the button that best represents your idea.

The message that I read are…

1	Unbelievable	1	2	3	4	5	6	7	Believable
2	Untrustworthy	1	2	3	4	5	6	7	Trustworthy
3	Not credible	1	2	3	4	5	6	7	Credible
4	Dishonest	1	2	3	4	5	6	7	Honest
5	Questionable	1	2	3	4	5	6	7	Unquestionable
6	Not authentic	1	2	3	4	5	6	7	Authentic
7	Unlikely	1	2	3	4	5	6	7	Likely
8	Not convincing	1	2	3	4	5	6	7	Convincing
9	Unreasonable	1	2	3	4	5	6	7	Reasonable
10	Inconclusive	1	2	3	4	5	6	7	Conclusive

Appendix D: Informed Consent Form

Consent to Participate in Internet Research

Title of Study: Environmental Communication - A case of recycling

Welcome to the "Environmental Communication" Study

<u>**Study Topic**</u>
The purpose of this research is to understand how people in the U.S. think about sustainability and perform sustainable behaviors, in particular, recycling. To be eligible participants in this study, you must live in the U.S. and 18 years old or older. If you choose to participate in this study, you will be asked to **<u>view two messages</u>** and complete a questionnaire that asks about your perceptions, attitudes, and intention toward the environmental-related issue and messages.

 If you agree to participate:
·   The **participation in this study** will take approximately 5-10 **minutes** of your time.
·   You will complete several a set of questionnaire about **your perception, attitude, and behavior intention toward environmental-related messages.**
·   You **will** be compensated for the main survey.

Risks/Benefits/Confidentiality of Data
There are **no known risks.** There will be no costs for participating, nor will you benefit from participating. Only the researcher will have access to the data during data collection.

Participation or Withdrawal
Your participation in this study is voluntary.   You may decline to answer any question and you have the right to withdraw from participation at any time.   Withdrawal will not affect your relationship with The University of Texas in anyway.   If you do not want to participate either simply stop participating or close the browser window.

Contacts
If you have any questions about the study or need to update your email address contact the researcher to **Hyeseung Koh** send an email to <u>kohhye@utexas.edu</u>**.** This study has been reviewed by The University of Texas at Austin Institutional Review Board and the study number is 2017-06-0113.

Questions about your rights as a research participant.
If you have questions about your rights or are dissatisfied at any time with any part of this study, you can contact, anonymously if you wish, the Institutional Review Board by phone at (512) 471-8871 or email at orsc@uts.cc.utexas.edu.

Thank you!

Please press the arrow button, if you want to proceed to the next screen and begin the survey.

Appendix E: Questionnaire for Main Experiment

Pre-Test

Please answer the following questions to the best of your ability. There is no right or wrong answer.

Are you a resident of or do you currently reside in the U.S.?
        Yes   No (if no, end of survey)

What is your age? _____

What is your gender?   a. Male   b. Female

Please indicate how much you agree with the following statements. Your answer can range from strongly disagree to strongly agree.

New Environmental Paradigm (NEP) Scale

1. We are approaching the limit of the number of people the earth can support.
        Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
2. The balance of nature is very delicate and easily upset.
        Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
3. Humans have the right to modify the natural environment to suit their needs (reverse-coded).
        Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
4. Mankind was created to rule over the rest of nature (reverse-coded).
        Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
5. When humans interfere with nature it often produces disastrous consequences.
        Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
6. Plants and animals exist primarily to be used by humans (reverse-coded).
        Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
7. To maintain a healthy economy we will have to develop a "steady-state" economy where
     industrial growth is controlled.
        Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
8. Humans must lie in harmony with nature in order to survive.
        Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
9. The earth is like a spaceship with only limited room and resources.
        Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
10. Humans need not adapt to the natural environment because they can remake it to suit their
     needs (reverse-coded).
        Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

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11. There are limits to growth beyond which our industrialized society cannot expand.
    Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
12. Mankind is severely abusing the environment.
    Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

Post-Test

Please answer the following questions to the best of your ability. There is no right or wrong answer.

Anticipated Pride

After viewing the messages (Control: When you think about recycling), to what extent do you anticipate to have the following emotions if you recycle materials you used?

I will feel (like I am or I have)…

1	Proud	not at all	1	2	3	4	5	6	7	very much
2	Accomplished	not at all	1	2	3	4	5	6	7	very much
3	Confident	not at all	1	2	3	4	5	6	7	very much
4	Satisfied	not at all	1	2	3	4	5	6	7	very much
5	Worthwhile	not at all	1	2	3	4	5	6	7	very much
6	Achieving	not at all	1	2	3	4	5	6	7	very much
7	fulfilled	not at all	1	2	3	4	5	6	7	very much
8	Productive	not at all	1	2	3	4	5	6	7	very much
9	Successful	not at all	1	2	3	4	5	6	7	very much

Attitude

Please click the button that best represents your idea.

For me, doing recycling is…

1	Useless	1	2	3	4	5	6	7	Useful
2	Harmful	1	2	3	4	5	6	7	Beneficial
3	Foolish	1	2	3	4	5	6	7	Wise
4	Bad	1	2	3	4	5	6	7	Good
5	Dumb	1	2	3	4	5	6	7	Smart

6	Negative	1	2	3	4	5	6	7	Positive
7	Unsensible	1	2	3	4	5	6	7	Sensible
8	Non-likable	1	2	3	4	5	6	7	Likable

Intention to talk

Please indicate how much you agree with the following statements.

1. I intend to talk with my family about recycling in the near future.
   Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
2. I mean to talk with my family about recycling in the near future.
   Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
3. I have it in my mind to talk with my family about recycling in the near future.
   Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
4. I will talk with my family about recycling in the near future.
   Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

Intention to recycle

Please indicate how much you agree with the following statements.

1. I plan to sort trash in order to recycle materials I use.
   Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
2. I intend to recycle materials that I use.
   Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
3. It is likely that I will put materials into the corresponding recycling bin.
   Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

Behavioral privacy 1

Please click the button that best represents your idea.

For me, recycling is a(n)…

1	Private Behavior	1	2	3	4	5	6	7	Public Behavior
2	Non-observable behavior	1	2	3	4	5	6	7	Observable Behavior
3	Inconspicuous Behavior	1	2	3	4	5	6	7	Conspicuous Behavior

Behavior privacy 2

Please indicate how much you agree with the following statements.

1. I can see whether or not people recycle materials they used.
      Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
2. People can see whether or not I recycle materials they used.
      Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
3. Looking around a public place, I notice when people don't recycle materials they used.
      Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
4. Looking around a public place, people notice when I don't recycle materials I used.
      Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

MANIPULATION CHECK

Perceived descriptive norms contents in the message

Please indicate how much you agree with the following statements.

1. The information presented in the messages indicates that most people in the U.S. recycle.
    materials they used.
      Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
2. Clearly, these messages show that many people in the U.S. are recycling materials they used.
      Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
3. The messages state that many people in the U.S. recycle materials they used.
      Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
4. From the information in the messages, it seems that there are many people in the U.S. who recycle materials they used.
      Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

Perceived injunctive norms contents in the message

Please indicate how much you agree with the following statements.

1. Based on the messages I saw, I feel like people in the U.S. would think less of me if I don't recycle materials I used.
      Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
2.   It is clear from these messages that people in the U.S. believe that recycling is important.
      Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
3. The messages show people in the U.S. approve of recycling.
      Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

4. These messages show that people in the U.S. would respect me more if I recycle materials I used.
> Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

Perceived prevalence of recycling

Please indicate how much you agree with the following statements.

1. Most people in the U.S. engage in recycling materials they used.
> Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
2. Most people in the U.S. recycle materials they used.
> Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
3. More than 50% of the people in the U.S. engage in recycling materials they used.
> Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
4. The majority of people in the U.S. engage in recycling material they used.
> Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

Perceived approval of recycling

Please indicate how much you agree with the following statements.

1. Recycling is something that most people in the U.S. think I should do.
> Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
2. People in the U.S. think I should endorse recycling.
> Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
3. People in the U.S. may judge me based on whether or not I endorse recycling.
> Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
4. I feel like people in the U.S. would think less of me if I did not recycle materials I used.
> Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

COVARITES

Message believability

Please click the button that best represents your idea.

The messages that I read are…

1	Unbelievable	1	2	3	4	5	6	7	Believable
2	Untrustworthy	1	2	3	4	5	6	7	Trustworthy
3	Not credible	1	2	3	4	5	6	7	Credible
4	Dishonest	1	2	3	4	5	6	7	Honest

5	Questionable	1	2	3	4	5	6	7	Unquestionable
6	Not authentic	1	2	3	4	5	6	7	Authentic
7	Unlikely	1	2	3	4	5	6	7	Likely
8	Not convincing	1	2	3	4	5	6	7	Convincing
9	Unreasonable	1	2	3	4	5	6	7	Reasonable
10	Inconclusive	1	2	3	4	5	6	7	Conclusive

Social Desirability

Please indicate how much you agree with the following statements.

1. I find that I can help others in many ways.
    Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
2. In spite of many changes, there are still definite rules to live by.
    Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
3. One can always find family if he tries.
    Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
4. It is difficult to think clearly about right and wrong these days. (reverse-coded)
    Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
5. Many people are friendly only because they want something from you. (reverse-coded)
    Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
6. At times I feel that I am a stranger to myself. (reverse-coded)
    Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

Past behavior

1. Do you currently recycle all your waste systematically?
    1. Yes
    2. No

If Yes,
2. How much do you think you recycle all your waste systematically?
    (fill out a number between 1% and 100%)."

Self-monitoring

Please indicate how much you agree with the following statements.

1. It is my feeling that if everyone else in a group is behaving in a certain manner, this is probably the proper way to act.

       Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

2. At parties I often behave in a manner that sets me apart. (reverse-coded)

       Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

3. When I am uncertain how to act in a social situation, I look to the behavior of others for cues.

       Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

4. I try to pay attention to how others react to my behavior in order to avoid being out of place.

       Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

5. It's important to me to fit into the group I'm with.

       Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

6. My behavior often depends on how I feel others think I should behave.

       Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

7. When in a social situation, I tend not to follow the crowd but, instead, behave in a manner that suits my particular mood at a time. (reverse coded)

       Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

Demographic information

1. Please indicate your ethnicity.

Caucasian/White   Hispanic/Latino   African American
Asian American   Asian   Native American   Pacific Islander
Multiracial   Other (   )

2. What is the highest degree or level of school you have completed?
If currently enrolled, highest degree received.

High school graduate, diploma or the equivalent (for example: GED)
Some college credit, no degree
Trade/technical/vocational training
2 year college degree (Associate)
4 year college degree (e.g., BA/BS)
Professional degree (MD/JD)
Master's degree
Doctorate degree
Other

3. What is your annual income range?

Below $20,000

$20,000 - $29,999
$30,000 - $39,999
$40,000 - $49,999
$50,000 - $59,999
$60,000 - $69,999
$70,000 - $79,999
$80,000 - $89,999
$90,000 or more

4. In what state do you currently reside?
(   )

5. Any other thoughts you want to share while taking this survey!
(   )

Thank you for your participation.

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