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The joint effects of persuasion and implementation intentions : an investigation using the theory of planned behavior.

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THE JOINT EFFECTS OF PERSUASION AND IMPLEMENTATION INTENTIONS:
AN INVESTIGATION USING THE THEORY OF PLANNED BEHAVIOR.

A Thesis Presented

by

MARK MANNING

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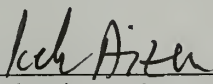
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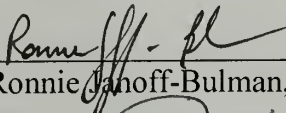
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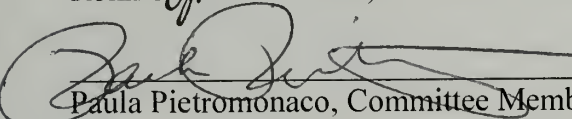
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ABSTRACT

THE JOINT EFFECTS OF PERSUASION AND IMPLEMENTATION INTENTIONS: AN INVESTIGATION USING THE THEORY OF PLANNED BEHAVIOR.

FEBRUARY 2006

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The effects of exposure to a persuasive message regarding donating blood and forming an implementation intention to donate blood was investigated in the context of the theory of planned behavior. A theorized model built on the theory of planned behavior (Ajzen, 1991) and the model of action phases (Gollwitzer, 1996) hypothesized two phases, one susceptible to effects of exposure to persuasive messages (deliberative phase) and the other to the effects of implementation intentions (implemental phase). ANOVA indicated no main effect or interaction of either implementation intentions or persuasive messages on attitude, subjective norm, perceived behavioral control or intentions to donate blood. Also, no effects were found on the target behavior of attending a blood drive. In an internal analysis utilizing regressions, an interaction was found between the goal intention to donate blood and forming an implementation intention in that implementation intentions strengthened the relationship between goal intentions and behavior. A main effect was also found for exposure to a persuasive message on the accessibility of intentions to donate blood as measured by response latencies. A measure of self identity as a person who donates blood was found to be mediated by commitment

to engage in the target behavior. Furthermore, results of a confirmatory factor analysis suggest that self-identity has a different cognitive origin than intention and commitment.

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LITERATURE REVIEW

Introduction

Currently there is no substitute for human blood used in emergency rooms and medical procedures. The nation's blood supply is entirely sustained by volunteers. Despite the lack of a substitute and the relative ease of donating, only 5% of the eligible population in the United States heeds the entreaties of the Red Cross to donate blood in any given year.

How can more people be induced to donate blood? Once they have decided to do so, how can we ensure that they comply with their intentions? These specific questions lead to two general questions: How does one influence a person's decision to engage in a particular behavior and, having successfully done so, how does one increase the likelihood that that individual will translate the intention into action?

Past research in social psychology has investigated either the effects of persuasive communications on attitudes or the relation between attitude and subsequent behavior. Almost no research has examined the complete route from persuasive influence to behavioral engagement. One study (Leventhal, Singer, & Jones, 1965) suggested that a specific plan of action was more important than strong intentions born of fear when predicting behavioral engagement. In this experiment, participants were exposed to a persuasive message designed to manipulate level of anxiety regarding tetanus. A portion of the participants were instructed to form a specific plan to receive an inoculation against tetanus, whereas the remainder were not instructed to make such a plan, though they were informed where they could receive the inoculation. The fear manipulation was successful, with participants in the high fear condition reporting stronger intentions to be

inoculated when compared to participants in the control condition. However, with the exception of one participant, only those who had made specific plans to receive the inoculation proceeded to do so.

A subsequent investigation (Evans, 1970) found similar results with regard to specific plans and action. This study demonstrated that participants in experimental conditions who received elaborated recommendations containing specific procedures for dental hygiene were more likely to modify their behavior in accord with the recommendations compared to participants in conditions who received high fear messages, positive appeal messages, or non-elaborated recommendations. Importantly, no correlation was found between information retained and the measures of behavior. This suggests that the behavioral responses were not a function of information retained from any of the messages regarding dental care, but rather was a function of the specific attributes of the messages in that elaborated recommendations had specific action plans whereas the other messages did not. What these previous studies lacked was an empirically supported theoretical framework within which to investigate the path from persuasion to behavior. Such a theoretical framework would probe the effects of persuasion (be it a fear inducing message, positive appeal message, or another forms of persuasive message) on the antecedents of engaging in a particular behavior and then examine the effects of changes in these antecedents on actual behavior.

Persuasive Messages

One means by which people can be induced to perform a particular behavior is through the use of a persuasive message to influence their beliefs, attitudes, and intentions with respect to the behavior. Perhaps the most widely accepted model

regarding the efficacy of persuasive messages is the Elaboration Likelihood Model of persuasion (Cacioppo, Petty, & Stoltenberg, 1985; Petty, Cacioppo, Strathman, & Priester, 1994). This model posits that a persuasive message will have its strongest effects on behavior when the recipient of the message processes it via the relatively effortful central route in which attention is paid to the contents of the message. In contrast to the central route, the peripheral route is one in which the recipient of the message attends more to the peripheral cues that accompany a message, such as the credibility and attractiveness of the message source, the length of the message and the number of supporting points contained in the message. Attitudes following a persuasive message processed via the central route are expected to be more predictive of subsequent behavior than are attitudes following peripheral processing.

The mechanism along the route to central processing of a persuasive message is the elaboration of the persuasive message. Elaboration relates the presented message to previous stored knowledge and generates new implications. Message elaboration is expected under conditions of high motivation and cognitive capacity. When the recipients of a message are highly motivated to process the message and when they have the time and information required to do so, they are likely to engage in extensive elaboration. Empirical research has established that, under these conditions, attitude change tends to be relatively persistent over time and predictive of later behavior (Cacioppo et. al., 1985; Zanna, Fazio, 1994)

Personal relevance of the message, strong arguments, and multiple sources of information in the message are some of the factors that contribute to increased motivation to process the message, whereas an individual's need for cognition is a dispositional

factor that contributes to the likelihood of elaboration (Haugtvedt & Petty, 1992). In the realm of cognitive capacity, the determining factors are related to the level of distractions one encounters while being presented a persuasive message, whereas dispositional factors are related to intelligence and amount of message – relevant knowledge.

Motivational factors that increase the likelihood of message elaboration, particularly when the focus of the message is engagement in a particular behavior, are subject to experimental manipulations. It can be argued that encouraging an individual to elaborate on message consistent beliefs following exposure to a persuasive message will help to foster positive attitudes in line with message content. In fact, it has been demonstrated that listing positive thoughts engenders positive affect regarding behavioral outcomes (Sanna & Schwarz, 2004). Consequently, a fluency manipulation wherein an individual is asked to list positive and personal message relevant beliefs is expected to strengthen attitudes in line with the message content.

Following exposure to a persuasive message, the processes involved in engaging in behavior passes through two phases. First, the individual has to come to a decision to engage in the particular behavior. Second, once a favorable intention has been formed, the individual has to act in accordance with the intention and engage in the behavior.

Deliberative and Implemental Phases

According to Peter Gollwitzer's Model of Action Phases (Gollwitzer, 1996), in the steps leading up to realization of a behavioral goal, an individual goes through two distinct phases. In the deliberative phase, a decision is made to engage in the behavior. In the implemental phase, plans are made as to how to carry out the behavior. Gollwitzer posited two different sets of cognitions for each phase. The deliberative phase is

characterized by a relatively impartial appraisal of the behavior under consideration. As the individual is not yet committed to the behavioral goal in the deliberative phase, it is in this phase that a persuasive message may induce a person to form a favorable intention to engage in a particular behavior.

Following deliberation, receivers decide as to whether they will engage in the advocated behavior. Assuming that a favorable intention to engage in the behavior is formed, they would then enter the implemental phase. The implemental phase is characterized by a different cognitive mindset than the deliberative phase in that there is a biased and optimistic view of the behavior. It is in this phase that the individual makes specific plans to accomplish the behavioral goal.

Implementation Intentions

An implementation intention is, in effect, a particular plan in service of a behavioral goal. The function of a plan is to facilitate the performance of a task by attending to the logistical and intellectual demands of the task. In forming a plan, the logistical demands (i.e. when, where and how goal directed behaviors will be implemented) may be passed on to environmental cues. For instance, imagine that an individual has formed an intention to paint his house. The likelihood of his following through without planning a specific day, as well as attending to the steps along the way to gather material for that day would be small. However, if this individual did make plans to attend to the steps needed to paint his house, then the likelihood of his doing so increases. Therefore, the situational cues of time and environment, for example Friday afternoon and shopping, will remind him to pick up the materials. Saturday morning will remind him to engage in the task. Much in the way that a habit establishes cues for behavior in a

specific environment, an implementation intention is thought to function through the same cognitive route, namely the formation of an association between environmental cues and a behavior (Aarts & Dijksterhuis, 2000; Gollwitzer, 1999; Verplanken & Faes, 1999). Implementation intentions have been found to facilitate aspects of goal striving in a variety of situations, for example, in the health domain (Rise, Thompson, & Verplanken, 2003; Sheeran & Orbell, 2000; Verplanken & Faes, 1999), with regards to novel behaviors (Bamberg, 2002) repeated behaviors (Sheeran & Orbell, 1999) task focus (Gollwitzer, 1996; Gollwitzer & Brandstatter, 1997; Koole & Spijker, 2000; Webb & Sheeran, 2003) and personal goal striving. In essence, the more difficult the goal, the more facilitated it will be by the formation of an implementation intention.

Several studies have investigated alternative mechanisms contributing to the utility of implementation intentions not centered on the role of habit or situational cues. Specifically the effect of forming implementation intentions on attitudinal or motivational variables have been investigated (e.g. Milne and Sheeran, 2002; Gilholm, 1999 and 2000). These studies have consistently failed to find a main effect of forming implementation intentions on attitudinal or motivational variables. Though there is no direct effect on attitude or motivation, recent studies have found interaction effects between implementation intentions and goal intentions in predicting behavioral engagement (Garling & Fujii, 2002; Sheeran, Webb, & Gollwitzer, 2005). Results demonstrate that implementation intentions are more effective for participants who hold favorable rather than unfavorable behavioral intentions.

Persuasive messages have been identified as useful in influencing intentions to engage in a behavior (citations). Implementation intentions have been identified as a

means to increase the likelihood that an individual who has formed an intention will act in accordance with it. As such, two cognitive manipulations are proposed which should operate to influence behavioral engagement. However we need a theoretical framework within which to assess their utility. The theory of planned behavior (Ajzen, 1991) serves this purpose.

The Theory of Planned Behavior.

The theory of planned behavior is a model that predicts human behavior in specific contexts (see Figure 1). The direct antecedent to behavioral engagement is the intention to perform the behavior. The intention to perform the behavior is a function of three major determinants: the attitude towards the behavior, perceived social norms pertaining to the behavior (subjective norms), and the perceived degree of control over engaging in and completing the behavior (perceived behavioral control).

The formation of attitudes, subjective norms and perceived behavioral control are respectively functions of behavioral beliefs, normative beliefs and control beliefs that a person holds with regards to the behavior. Concerning attitudes, the set of accessible beliefs that a person holds about the outcome of a behavior will determine the evaluation of the behavior, and thus influence the strength and direction of the attitudes towards the behavior. "Each belief associates the object [or behavior] with a certain attribute and a person's overall attitude towards an object [or behavior] is determined by the subjective values of the attributes in interaction with the strength of the associations." (Ajzen, 2000) Subjective norms are a function of the normative beliefs that people relevant to the individual are perceived as having towards the behavior coupled with the motivation of the individual to comply with the expected norms of these relevant persons. Perceived

behavioral control is a function of the perceived factors that will influence the ability to engage in the behavior coupled with the perception as to whether or not these factors will be present.

In short, the theory of planned behavior holds that favorable attitudes, favorable subjective norms, and perceptions of control will lead to favorable intentions to engage in a given behavior. Actual control over engaging in the behavior is itself an important determinant. To the extent that the individual realistically appraises the amount of control that he or she has over the behavior, the measure of perceived behavioral control can serve as a proxy for actual control. The measures of intention and perceived behavioral control directly predict behavior.

The theory of planned behavior has been investigated successfully with consistent results (Bamberg, Ajzen, & Schmidt, 2003; Hardeman et al., 2002; Povey, Wellens, & Conner, 2001; Rise et al., 2003) accounting for a sizable amount of variance across a wide range of behaviors. The model can serve as the framework within which to develop a paradigm to investigate the effects of persuasive messages on intention, as well as the effects of implementation intentions on intention-behavior consistency.

The Role of Commitment

There has been little empirical data thus far on the role of commitment to engage in a behavior within the framework of the theory of planned behavior. It has been found that forming an explicit commitment to engage in a behavior will increase the proportion of participants who subsequently engage in a target behavior (Ajzen et. al., 2002 – unpublished study). However, the *level* of commitment to engage in a particular behavior has not been assessed within the contexts of the theory of planned behavior, and

consequently the relationship between the level of commitment and other planned behavior variables has not been empirically established. Given that Ajzen et. al. (2002) found that participants who formed an explicit commitment to do so engaged in a target behavior in higher proportions, it is plausible that higher self reported levels of commitment to engage in a behavior would lead to higher intentions to engage in the behavior. This relationship will be explored in the current study.

The Role of Self-Identity

In an effort to expand the predictive utility of the theory of planned behavior, a host of independent variables were suggested that could be added to predict intention and behavior (Conner & Armitage, 1998). One such variable is self-identity. Derived from identity theory (Stryker, 1968), self-identity concerns the salient part of the actor's self that relates to a particular behavior. The self is conceived of not wholly as an individual entity, but rather as comprised of multiple identities within a social construct (i.e. mother, Republican, auto-mechanic) and consequentially having roles to fulfill consistent with a particular identity (i.e. child-rearing responsibilities, voting for a particular candidate, servicing vehicles). The greater the extent to which a person identifies as the sort of person who will engage in a relevant behavior of interest, the stronger should be the intention to engage in the behavior. However, attention ought to be given to the distinction between self-identity and social identity. Self-identity, particularly in relation to a specific behavior, is concerned with "individual level identity composed of information on self-understanding of 'ME's'" (Fekadu, 672). In contrast, social-identity can be conceived as "the reflections on the identifications of the self with a social group or category, that is, the self as an interchangeable group member ('WE's')" (Fekadu,

672). In other words, in a behavioral context self-identity is a variable concerned with conceptions of one's "self" as it relates to engagement in a particular behavior, with the understanding that the behavioral context may intrinsically make different conceptions of one's "self" more salient. In the same behavioral context, social-identity is a variable concerned with group membership and group norms with respect to the behavior, with the self's membership in a particular group and the group's norms regarding the behavior being focal. Both variables are conceivably determinants of intentions to engage in a particular behavior. For example, a woman may be both a devoted working mother and a strong Republican, and both roles may be a determinant of attitudes towards legislation regarding after-school programs; however a stronger self-identification with her role as a devoted working mother may lead to a vote in favor of the legislation that may be inconsistent with her social identification as a Republican.

Several studies have found that a measure of self-identity accounts for between 2% and 8% of unique variance in the prediction of intention when controlling for other variables within the theory of planned behavior. Statistically significant evidence for the inclusion of the self-identity variable has been found in the areas of health behavior (Conner & McMillan, 1999; Fekadu & Kraft, 2001; Pierro, Mannetti, & Livi, 2003; Sparks & Guthrie, 1998), blood donation (Armitage & Conner, 2001; Giles, McClenahan, Cairns, & Mallet, 2004), recycling (Terry, Hogg, & White, 1999) and consumer behavior (Sparks & Shepherd, 1992) (however, see Conner & Flesch, 2001 wherein self-identity had no predictive significance with regards to intentions to have casual sex).

A possible moderating role of past behavior or habit on the relation between self identity and intentions to engage in a behavior has also been investigated. It has been

suggested that the relation between self-identity and intentions increases for frequently performed behaviors (see Fekadu, 2001). It is expected that, for such behaviors, the salience of self-identity as opposed to attitudinal variables will determine intentions to engage in the behavior. Self-identity has been shown to maintain unique predictive utility when measures of past behavior have been included in the predictive model (Fekadu & Kraft, 2001), and the hypothesized interaction between self-identity and past behavior has been supported (Conner & McMillan, 1999; Pierro et al., 2003; Sparks & Guthrie, 1998).

Self-identity is typically assessed by asking people whether they see themselves as someone who will perform a particular behavior. Examples of items used are “To give blood is an important part of who I am.” (Giles et al., 2004) and “I think of myself as a ‘green consumer’” (Sparks & Shepherd, 1992). After reading each statement, the participant is asked to indicate the extents of agreement on a scale typically anchored with agree/disagree. A summary of some of the criticisms of these measurement procedures is provided by Pierro (2003);

(a) they [measurement instruments] might have made cognitively available possible behavior outcomes that in normal decision situations were less accessible (Sparks et. al., 1995); (b) these measures might, indeed, be measures of past behavior (Sparks and Guthrie, 1998), and (c) these measures might actually assess behavioral intentions (Fishbein, 1997). These criticisms suggest that the relationships between identity and intentions that emerged from the studies in which they were used may be methodological artifacts. (Pierro, 49).

In an effort to circumvent these artifacts, Pierro (2003) used a measure of self-identity wherein he asked participants to rate a prototypical person who performs a particular behavior and then to rate their own “personal identity” on the same set of pre-tested

adjectives. A difference score was then computed and used as a measure of distance between the prototype and the participant's self image. The less the distance, the closer was the participant's self-identity as someone who will engage in the particular behavior. A disadvantage of Pierro's method however was that there was no measure of self-identity akin to the previous measures that were being criticized. As a consequence, the relationship between the scores garnered from alternate measurement techniques could not be investigated. Furthermore, though self identity as measured by this alternative method did lead to an increase in variance accounted for in the prediction of intentions in structural regression models ($\Delta R^2 = 0.07$ in study 1, 0.03 in study 2), the change in the Comparative Fit Index was negligible ($\Delta CFI = 0.01$ in study 1 and 0 in study 2).¹ These issues will be addressed in the present study by assessing self-identity using both methodologies, as well as investigating their contribution to the prediction of intention.

Attitude Accessibility

In line with the theory of planned behavior, the extremity of one's attitude towards a behavior will ultimately influence one's intention to engage in the behavior. Attitude accessibility, or the ease with which one recalls a previously established attitude towards a behavior, may also be a determinant of the relation between behavioral intentions and behavioral engagements. It is plausible that attitude accessibility influences behavior via the relationship between attitudes and intentions. The ease with which one accesses attitudes may also predict intention accessibility which is a potential moderator of the relationship between intentions and behavior. The ease with which one responds to attitudinal questions about an object is taken to indicate the strength of the

¹ As the models were not nested, a direct statistical comparison between model chi-square could not be used.

link between the cognitive representation of the object and the evaluation of the object in memory. Latency measures are typically employed to measure the accessibility of the attitude, with quicker latencies indicating stronger associations between an attitude object and its corresponding evaluation. Latency measures are also indicative of the propensity for automatic activation of the attitude when encountering the attitude object (Fazio & Williams, 1986). The relationship between attitude strength and latency has been empirically demonstrated (Powell & Fazio, 1984) in that the more extreme is the valence of the attitude, the quicker are the responses to attitude questions. Measures of the accessibility of one's attitudes towards an attitude object or a behavior have been shown to have a moderating affect on the relationship between attitudes and behavior (Fazio, Powell, & Herr, 1983; Fazio & Williams, 1986); the greater the accessibility of the attitude, the stronger is the relationship between the attitude and behaviors consistent with the attitudes. Taken together, the findings of Fazio and his colleagues suggest that the accessibility of the attitude also influences the likelihood of attitude-consistent behavior.

Following Fazio's work on attitude accessibility, investigations have sought to determine the relationship between attitude accessibility and the effects of persuasive messages. Effects of persuasive messages have been demonstrated to be more effective for participants with more highly accessible attitudes (Fabrigar, Priester, Petty, & Wegener, 1998; for review see Roskos-Ewoldsen, 1997). It is theorized that attitudes that are more highly accessible will influence processing of incoming information; persons with more highly accessible attitudes are more likely to attend to persuasive messages and integrate information in line with existing attitudes. Research investigating the effects

of persuasive message on the accessibility of attitudes and subsequent effects on behavior is sparser (Roskos-Ewoldsen, 1997). The relationship between a particular type of persuasive method, namely fear appeals, and attitude accessibility has been empirically demonstrated in a study of breast cancer and breast self-examinations (Roskos-Ewoldsen, Yu, & Rhodes, 2004). Efficacious fear appeals were found to increase accessibility of attitudes towards breast self-examinations. A main effect of being exposed to efficacious fear messages was also found for behavioral intentions, and the attitude accessibility was also found to predict intention to perform breast self-examinations. In line with these findings, it is expected that other (non-fear) methods of persuasion will have a similar effect on attitude accessibility in that they will serve to strengthen attitude accessibility and strengthen the accessibility of goal intentions.

Though as of yet there is no theoretical reason to assume that the formation of an implementation intention will influence attitude accessibility, the methodology of the current study lends itself to that exploration.

A MODEL BUILT ON THE THEORY OF PLANNED BEHAVIOR

Thus far two phases that are susceptible to manipulations designed to influence a person to perform a particular behavior have been identified, namely the deliberative phase and the implemental phase. Also a manipulation for each phase that is expected to be beneficial in the service of goal completion has been identified: Persuasion, and its effects on intentions in the deliberative phase, and the formation of implementation intentions in the implemental phase and their subsequent effects on the relationship between goal intentions and behavior. Using the theory of planned behavior as a model for predicting behavior that allows for measuring the formation of intentions as well as the relationship between intentions and behavior, we are well poised to use these variables and theories to construct a model to investigate the route from persuasion to action. Figure 2 presents a diagram of the proposed paths of the model.

The model consists of two phases on the route from persuasion to action, namely the deliberative and implemental phases. It was proposed that the direct effects of the manipulations are confined to their respective phases within the model. Therefore, persuasive messages would directly influence attitudinal variables through their cognitive precursors. Implementation intentions would have a direct effect on the relationship between intentions and behavior as well as direct effects on behavioral intentions and attitudes towards behavior. The validity of this model was tested in the context of inducing participants to attend blood donation drives.

Study Overview

The target behavior for the current study is donating blood at a campus blood drive. According to the American Red Cross, approximately 5% of eligible participants in

the United States contribute to the blood bank with their donations of blood. Donating blood at a campus blood drive was chosen because it is not a normative activity yet it is within the realm of possible involvement for a student population.

In accordance with the integrated paradigm, we will be uniting persuasive messages and implementation intention around the framework of the theory of planned behavior. The paradigm involving the above variables allowed us to investigate just how it is that persuasive messages and implementation intentions might work independently and in chorus to influence behavior. The following hypotheses were investigated in the present study:

1. A main effect of exposure to a persuasive message is expected such that participants who receive the persuasive message form stronger intentions to donate blood than individuals in a control condition.
2. A main effect of implementation intention is expected such participants who form an implementation intention are more likely to donate blood than individuals who do not form an implementation intention.
3. The relation between intention and behavior is expected to be stronger for participants who formed an implementation intention than for participants who do not do so.
4. Self-identity is expected to be related to intention; however this relationship will be mediated by other planned behavior variables.
5. A main effect of both implementation intention and of persuasive message is expected on the reaction times for responses to attitude and intention questions

such that participants who receive either manipulation will have quicker responses.

Methods

Participants

95 undergraduate students from the University of Massachusetts Amherst took part in the experiment. Students were recruited for a “Health Survey Study” so as to not have a selection bias with regards to students who may or may not have been interested in donating blood. Students received extra credit for participating.

Procedure

Time 1

All participants were run individually on desktop computers using MediaLab and DirectRT applications to complete survey and reaction time components of the experiment.

All participants were first instructed to complete ratings of themselves on adjective pairs with the introduction that adjectives were being piloted for use in unrelated personality inventories. Following this, participants completed background measures in which questions to assess their blood donation history were embedded. Participants were also asked to report whether or not they thought they might be ineligible to donate blood.

Participants then read through materials having to do with either the history of the Red Cross (irrelevant message control condition) or a message constructed and previously piloted to produce positive attitudes and intentions with respect to the act of

donating blood (persuasive message condition). In an attempt to further promote favorable attitudes and intentions, a fluency manipulation was presented following the persuasive message in which each participant was asked to list two reasons why it would be a good thing to donate blood, two people with whom they were close who would be in favor of them donating blood, and two reasons why giving blood would be an easy thing to do.

Following the messages (and where applicable, the fluency manipulation) half of the participants (implementation intention conditions) were presented dates of three blood drives at the university within the upcoming month and asked to choose one they would attend. They were also asked to provide details of what time they would be attending the blood drive during the day and what they would be doing immediately before attending the blood drive².

The reaction time portion of the experiment followed. Participants first had a practice session with 13 questions unrelated to blood donation. The session was preceded by the instructions to respond as quickly and as accurately as possible. To prepare the participant before presentation of each question a mask (6 capital X's) was presented for 500 milliseconds, after which time the question was presented. The question remained on the screen until the participant either responded with a designated "Yes" key (/) or a designated "No" key (Z) to demonstrate agreement or disagreement with the statement. After completing the practice, participants moved directly to the data gathering portion which consisted of three questions related to attitudes (e.g. "It would be good for me to donate blood at a UMass blood drive"), four questions related to intentions (e.g. "I intend

² Some participants questioned the experimenter at this point as to whether or not they were obliged to attend a blood drive that they chose, and they were told that they were under no obligation to do so.

to donate blood at a UMass blood drive”) and six filler questions that were related to blood donation but were not constructed to gauge attitude or intentions (e.g. “I know where to go to sign up for a blood drive.”). Again, participants responded by pressing the keys designated as “agree” or “disagree.”

The planned behavior questionnaire was then completed, wherein attitudes towards donating blood, subjective norms, perceived behavioral control and intentions to donate blood were assessed. Also in the questionnaire were questions to assess self identity with regards to donating blood and commitment to donate blood. Finally, participants completed ratings of adjective pairs of a person who they thought would typically donate blood. The adjective pairs were a subset of those completed in the seemingly unrelated personality inventory (*Appendix A*).

Time 2

Participants were contacted by email approximately one month after participating in the study. They were asked to indicate whether or not they had donated blood, which blood drive they had attended if they did so, and why they had not donated blood if they didn't. They were also asked to indicate their intention to donate blood in the future on a scale of 1 to 7.

Measures

Theory of Planned Behavior: Attitude, subjective norm, perceived behavioral control and intentions to donate blood were measured with five questions each. Sample items include; “I intend to *donate blood at the University blood drive.*” (intention), “For me to *donate blood is* <extremely pleasant to extremely unpleasant>” (attitude), “Most people whose opinion I value would approve of me donating blood at a University blood

drive” (subjective norm) and “Whether or not I donate blood at a University blood drive is completely up to me” (perceived behavioral control). Participants responded on a 7 point scale.

Self-Identity and Commitment: Similar to the variables included in the theory of planned behavior, self-identity and commitment were measured with five items each. For self-identity, examples include; “Donating blood is an important part of who I am.”, and with regards to commitment, “It is quite hard for me to take seriously the task of donating blood.”

Identity Discrepancy: In describing attributes regarding the self (ID-Self), 23 contrasting adjective pairs were rated on a 7 point scale preceded by the instructions “Please rate yourself on each of the adjective pairs that follow.” 12 of the adjective pairs were repeated in garnering a measure of a person who “typically donates blood” (ID-Other). Details of the construction of an identity discrepancy score follow below in the results section.

Attending blood drive: The major outcome variable under study was whether or not a participant reported attending a blood drive. Some participants who attempted to donate blood were found to be ineligible. Their answer to the question as to whether or not they *donated* was not affirmative. However, as they did actually attend a blood drive, they were coded as having engaged in the target behavior.

Results

Descriptive Measures

Means, correlations and reliabilities (Cronbach alpha’s) for non-categorical variables analyzed are presented in Table 1. Participants reported favorable attitudes,

subjective norm, perceived behavioral control, intentions and commitment towards donating blood in that all the means for these variables were above the scale midpoint (4.00). Considering the mean for self identity, participants did not favorably identify themselves as someone who would donate blood in that this mean was below the midpoint. The identity discrepancy scale indicated small mean discrepancy between ratings of a prototypical blood donor and the self on adjective pairs, though the standard deviation was relatively large. Reliabilities of the scales ranged from 0.57 for subjective norms to 0.94 for intentions. Of the 95 participants, 9 reported that they had donated blood in the previous 12 months (prior behavior). Given the small number of participants who had donated in the past and given the lack of a significant relationship with attending blood drives ($\chi^2=1.357$, $df=1$, $p>0.25$), the prior behavior variable was excluded from further analyses.

Effects of manipulations

Of the 95 participants, 82 (86.3%) replied in the follow-up phase. ANOVA revealed no significant differences among the means for planned behavior variables, commitment, self identification or identification discrepancy between those participants who replied and those who did not. Of those who replied, 10 participants (12.2%) reported having attended the blood drive. Three participants were in the condition that received both an implementation intention and a persuasive message, one participant was in the condition that received only a persuasive message, three participants who attended were in the condition that received the irrelevant message with the implementation intention, and three received only the irrelevant message. Chi square tests for

independence revealed no effects of either implementation intention ($\chi^2=0.351$, $p>0.5$) or persuasive messages ($\chi^2=0.574$, $p>0.4$) with regards to attending blood drives.

MANOVA revealed no significant effects of implementation intentions or of persuasive messages on either the planned behavior variables or on measures of commitment and self identity. There was a marginally significant effect of the persuasive message on the measures of attitude ($F_{1,91}=3.514$, $p=0.064$) and subjective norm ($F_{1,91}=3.305$, $p=0.072$). Participants who received a persuasive message reported slightly more favorable attitudes than those who did not receive a persuasive message (4.92 vs. 4.47), and also reported more favorable subjective norms (4.63 vs. 4.27).

Predicting intention and behavior

In accordance with the theory of planned behavior model, intention to donate blood was regressed on attitudes, subjective norm and perceived behavioral control (*Table 2*). Of the three predictors, the coefficient for subjective norm was not significant. The model accounted for 63.8% of the variance. Attending a blood drive was then regressed on intention to donate blood and perceived behavioral control in a logistic regression. The coefficient (log-odds ratio) for intention was not significant in the regression, whereas the coefficient for perceived behavioral control was significant. The model fit was significant as assessed by the model chi-square ($\chi^2 = 6.195$, $df = 2$, $p<0.05$)

Commitment, Identity Discrepancy and Self-Identity Predicting Intention

An identity discrepancy score was created by subtracting the adjective ratings on the “ID Self” scale from the corresponding adjective ratings on the “ID Other”. This resulted in 12 scores that were averaged to arrive at a composite score for identity discrepancy. The 12 items had a reliability of 0.706. The correlations between this

measure of self-identity with the theory of planned behavioral variables were disappointing; only the correlation with perceived behavioral control was significant ($r = 0.299, p < 0.01$).

The separate scales (“self” and “other”) used to construct the discrepancy scores were each subjected to a principal component analysis. Of the 12 items analyzed in each scale, 6 were found to load uniquely on one component, while the others either did not load on the same component or varied depending on whether or not the adjective rating was for the “self” or the “other” (*Appendix A*). The discrepancy scores based on these 6 items were averaged to create a new scale score. The reliability of the scale constructed from these 6 items was 0.697. The resulting scale score was found to be significantly correlated with all but one of the remaining variables (*Table 1*). As such, the scale constructed from these 6 items was used to test hypotheses regarding the identity discrepancy measure.

A step-wise regression was used to examine the effects of adding the identity discrepancy variable to the planned behavior model to predict intention. Intention to donate blood was regressed on attitude, subjective norm and perceived behavioral control in step 1 with identity discrepancy being added in step 2. There was no significant change in the amount of variance accounted for ($\Delta F = 0.523, p > 0.45$). The coefficient for the identity discrepancy variable was also not significant in the model ($p > 0.45$).

A similar step-wise regression was used to explore the effects of including the direct measure of self-identification at step 2. The addition of the variable led to a 2.7% increase in the percent of variance accounted for, with the coefficient for the self-identification variable being highly significant ($p < 0.01$) and with no appreciable change in the

regression coefficients of the variables included in step 1. Given that the identity discrepancy shared the lowest correlation with other variables, and given that neither the coefficient nor the change in variance accounted for was significant when it was added to the prediction of intention, identity discrepancy was not used in any further analyses.

Finally, to test the effects of adding both self identity and commitment to the regression, a step-wise regression was performed in which step 1 remained as above. Step 2 involved the addition of the self-identification and the commitment variables (*Table 3*). Overall, the additions of these two variables lead to a significant 5.8% increase in variance accounted for ($\Delta F=8.443$, $df=2$, $p<0.001$). The coefficient for self-identification however was no longer significant ($p=0.365$) whereas the coefficient for commitment to donate blood was significant ($p<0.01$).

Using LISREL 8.5, a second-order confirmatory factor analysis employing an ordinary least squared method of estimation ascertained the relationship of intentions, self-identity and commitment to an underlying construct that was designated as motivation³. Given that there was one composite score for each variable, variables were parceled to create a suitable number of indicators for each construct (Little, Cunningham, Shahar, & Widaman, 2002). A principal component analysis was performed on the group of items measuring each variable to ensure unidimensionality. All items loaded on one component for the intention as well as the self-identity variable. Two parcels were created for each variable by placing the highest loading items in the first parcel followed by placing the second highest loading item in the second parcel. The third highest loading item was then also placed in the second parcel followed by the fourth highest loading

³ The sensitivity of the maximum likelihood method of estimation to matrices that are not positive-definite necessitated the use of the ordinary least squared estimation.

item being placed in the first parcel, with the remaining item also being assigned to the first parcel (See appendix B). Items measuring commitment loaded on two separate components. Due to this lack of unidimensionality of the commitment items, the full measure consisting of all five items was used to create the observed variable for commitment. Measurement error for the observed variable was calculated from the reliability of the commitment variable ($\alpha=0.694$) and was fixed in the model ($\epsilon=0.345$). The model was fit on the Y-side of the structural regression with the second order latent variable being defined on the X-side of the model (a Ksi). As there were no X-side observed variables, all variance attributed to Ksi (i.e. underlying motivation) is due to the observed scores and covariance matrix of the observed Y indicators.

Fit indices for the full model demonstrate a general lack of model fit ($\chi^2=15.664$, $df=3$, $p<0.01$, root mean square error of approximation [RMSEA] = 0.212), though the comparative fit index was within acceptable range indicating good model fit (CFI =0.965). Figure 3 displays the structural regression model displaying standardized estimates for the parameters. Standardized estimates may be interpreted as correlations between variables in the model. It can be seen that the relationship between commitment and self identity with the second order latent variable of motivation (1.01 and 0.87 respectively) are stronger than the relationship with the intention variables to underlying motivation (0.72), though attention should be drawn to the inadmissible correlation between commitment and underlying motivation.

To explore the fit of an alternative model, the relationship between self-identification and the two first order latent variables was defined as correlations between the residuals of self-identification with the residuals of intention and commitment (Figure

4). The correlations between the residuals stem from the predicted relationship between the latent first order variables as implied by the true scores of the indicators and the relationship defined by the second order variable of underlying motivation. This alternate model was superior as indicated by the fit statistics ($\chi^2=0.09$, $df=2$, $p>0.9$; $RMSEA=0.0$; $CFI=0.961$) A chi-square difference test revealed that the model fit was improved by defining the relationship between self-identification and the other two first order latent variables as implied by the alternative model ($\Delta\chi^2=15.565$, $df=1$, $p<0.001$). Implications of these results suggest that self-identification may be more appropriately conceptualized as a variable that is strongly related to commitment or behavioral intention, but that is not stemming from the same second order latent variable defined in these analyses as underlying motivation.

Moderating effect of implementation intention

To test for the moderating effect of the implementation intention manipulation on the relationship between intention to donate blood and attending a blood drive, as well as between perceived behavioral control and attending a blood drive, a series of stepwise logistic regressions were computed (*Table 4*). The variables were centered on their mean to alleviate potential problems due to multicollinearity. The first interaction term was computed from the product of the centered intention variable and the implementation intention dichotomous variable. The second interaction term was the product of the perceived behavioral control variable and the implementation intention variable. In step 1, attending a blood drive was regressed on intention to donate blood and perceived behavioral control. In step 2, the implementation intention variable was added. In step 3, the first interaction term was added, and in step 4 the second interaction term was added.

After the addition of the implementation intention variable in step 2, the coefficient for perceived behavioral control remained significant while the coefficient for implementation intention itself was not. In the third step, the coefficient for the first interaction term was significant (log-odds = 1.196, $p < 0.05$), while the coefficient for perceived behavioral control remained significant. In the final step, neither the coefficient for the second interaction term nor the coefficients for any of the other variables in the regression were significant.

A chi-square change statistic was used to assess significant increases in model fit due to the addition of each variable in subsequent steps (*Table 5*). The addition of the implementation intention variable in step 2 did not lead to a significant increase in model fit compared to step 1 ($\Delta\chi^2 = 0.87$, $df = 1$, $p > 0.1$). The addition of the interaction term between implementation intention and intention to donate blood led to a significant improvement in model fit ($\Delta\chi^2 = 6.263$, $df = 1$, $p < 0.05$). As the addition of the second interaction in step 4 did not lead to a change in model fit, the model in step 3 was interpreted as the final model.

A graphical display of the interaction is presented in figure 5. With all else being held constant, 3 levels of intention to donate blood (1 standard deviation below the mean, the mean intention and 1 standard deviation above the mean) were used to display the moderating effect of implementation intentions. For the condition without an implementation intention, varying levels of intention to donate blood did not lead to an increased likelihood of donating blood. However, in the condition that did receive an implementation intention, the odds of attending a blood drive increased with the measure of intention to donate blood. The odds of attending a blood drive is 0.006:1 in favor of

attending at one standard deviation below mean intention, 0.043:1 at the mean of intention and 0.31:1 at one standard deviation above the mean. The odds of attending a blood drive increased as a function of the intention to donate blood only among participants who had formed an implementation intention. In interpreting the results of the interaction using the model equation in step 3, it should be noted that the significant interaction was a product of two terms that were not themselves significant. Had the coefficient for the intention to donate blood been statistically significant, one might surmise that the odds of attending a blood drive would be larger.

Ancillary Analyses

Latency Analyses

Reaction time data was collected for inquiries regarding attitudes and intentions to donate blood. Due to the skewness of the reaction times, the log of the reaction times was used in the analyses. Utilizing an ANOVA, a main effect was found with respect to whether a participant answered each question favorably or unfavorably with regards to attending a blood drives (attitudes [$F_{1,283}=31.309$, $p<0.001$], intentions [$F_{1,378}=18.226$, $p<0.001$] and filler questions [$F_{1,568}=7.049$, $p<0.01$]) with participants consistently taking more time to answer unfavorably with regards to attending a blood drive than it took them to answer favorably. Due to the fact that latency is measuring the accessibility, and not the valence, of attitudinal and intentional responses, a participant's deviation from the mean reaction score should be roughly the same for favorable or unfavorable responses, thus indicating the strength of the cognitive link between object and evaluation as opposed to the direction of the attitude or intention. Considering this, deviation scores were computed and used in the subsequent analyses. The mean reaction time for

questions measuring the three variables (intention, attitude and filler questions) was calculated separately for favorable and for unfavorable responses. Reaction times were standardized for each variable within the favorability of the response by subtracting the mean from the score and dividing it's the standard deviation. In addition, outliers were removed such that participants whose log reaction times response on any questions in each category was greater than 2.5 standard deviations above the mean for that category were excluded from analyses. (9 participants were excluded in the analysis of attitude latencies, and 10 in the analysis of intention latencies.)

Standardized log reaction time scores for intention and attitudes were subjected to ANOVA's with the factors being implementation intention and exposure to the persuasive message. A main effect was found for exposure to a persuasive message for the standardized log reactions times of the intention questions ($F_{1,81}=5.646, p<0.05$). Participants who received a persuasive message were quicker to respond (mean standardized log reaction time = -0.179, standard deviation = 0.110) than those who did not (mean = 0.201, standard deviation = 0.117) The manipulations had no significant effects on mean standardized log reaction times for the attitude, and implementation intentions had neither a significant main effect nor a significant interaction with persuasive messages on any of the log reaction times.

In an effort to discern whether the level of one's intention to donate blood has a direct effect on latency in responding to intention questions, standardized log reaction times for intention were regressed on the intention variable. The resulting coefficient was not significant ($p=0.787$). There was also no significant interaction with implementation

intention or with exposure to persuasive message on the relationship between intentions and standardized log reaction times.

To explore the moderating effects of the accessibility of intentions on the relationship between persuasive messages and intentions, a stepwise regression was performed in which behavioral intention was regressed on the standardized log reaction times for intention in step 1, the categorical variable of exposure to a persuasive message was added in step 2, and an interaction term constructed from the product of the reaction time measure and the persuasive message variable was entered in step 3. In no step were the coefficients for the predictor variables significant.

Similarly, the moderating effect of accessibility of intention was investigated on the relationship between behavioral intention and attending a blood drive using step-wise logistic regression. The behavior was regressed on the centered intention variable in step 1. Standardized log reaction time measures for intention were entered in step 2, and the product interaction term was entered in step 3. None of the resulting coefficients were significant in any step. These results imply that the accessibility of intentions had no moderating effects on either the relationship between persuasive messages and intentions, or on the relationship between behavioral intentions and behavioral outcome.

Ancillary outcome measures

Participants who replied at time 2 and did not attend a blood drive were asked to respond to a question as to why they did not donate blood. 19.8% responded that they had no intention to donate blood, 19.8% responded that they forgot, 24.7% were too busy, 18.5% cited another reason that fell into neither of the aforementioned categories, and

9.9% neglected to answer the question⁴. The reported reason for not donating blood was independent of condition ($\chi^2=9.693$, $df=15$, $p>0.8$). On the measure of future intention to donate blood there was no main effect of, nor interaction with either manipulated variables.

Perception of eligibility

Of the 95 participants, 29 responded affirmatively that they thought they may be ineligible to donate blood. The responses were independent of condition ($\chi^2=0.524$, $df=3$, $p>0.9$). In comparing participants who did not think they were ineligible vs. those who thought they were, one way ANOVA displayed marginally significant differences between mean attitudes towards donating blood (4.836 vs. 4.372 respectively; $F_{1,93}=3.222$, $p=0.076$), and significant mean differences for subjective norms (4.679 vs. 3.938; $F_{1,93}=13.589$, $p<0.001$), perceived behavioral control (5.570 vs. 4.159; $F_{1,93}=29.190$, $p<0.001$) and intention to donate blood (4.461 vs. 3.152; $F_{1,93}=11.632$, $p<0.001$). The between group means for self identification and commitment to donate blood were statistically equivalent, suggesting that regardless of perception of eligibility, participants saw themselves as equally the kind of person who would donate blood and were all equally committed to doing so.

With regards to the 10 participants who attended a blood drive, there was a significant effect of thinking one was ineligible and blood drive attendance ($\chi^2=4.210$, $df=1$, $p<0.05$). However, this effect was not in the direction that one might expect. 60% of the participants who attended thought that they might have been ineligible to donate blood. This amounted to 23.1% of all participants who thought they might be ineligible

⁴ 7.4% of the participants responded that they tried but were ineligible. These participants were included among those who successfully engaged in the behavior as they did in fact attend a blood drive.

having attended vs. 7.1% of those who did not. Further analyses of the perception of ineligibility will not be reported in light of the small proportion of participants who attended a blood drive.

Discussion

The major manipulations of the present study failed to have their intended effects: there was no effect of implementation intention or of exposure to a persuasive message as opposed to a non-persuasive message on intentions to donate blood or on the proportion of participants who ultimately attended a blood drive. Implementation intentions had no main effect on any of the planned behavior variables or on engagement in the target behavior of attending a blood drive. The effects of exposure to a persuasive message were marginally significant for attitudes towards donating blood and for subjective norms with regards to donating blood.

In exploring reasons why participants did not attend blood drives, most participants reported that they were either too busy or had forgotten to attend the blood drive. Responses to an open ended question on the survey at time 2 revealed that a portion of the participants referred to a fear of needles or fear of blood. Perhaps it would have been instructive to collect data as to the extent to which participants were apprehensive about engaging in the target behavior for differing reasons so as to account for this attribute in the analyses. When a measure of participants' intention to donate in the future was assessed there was no significant effect of either of the manipulations on future intentions to donate blood. It appears that the simple manipulations utilized in this experiment, attempting to influence outcomes with regards to such an affect laden

behavior, were not enough to produce changes in attitudes or intentions that were enough to override procrastination, competing commitments, or intrinsic fears.

The only variable in which one of the manipulations had a significant main effect was in the effect of exposure to a persuasive message on the reaction time when responding to questions regarding intentions to donate blood. Participants who were exposed to a persuasive message were quicker to respond to questions gauging their intentions to donate blood. It is conceivable that participants who were exposed to a persuasive message had an opportunity to reflect on whether or not they would attend a blood drive. As such, their intentions to do so were more accessible when the opportunity to answer a question regarding this intention arose. This may have had less to do with an effect of the content of the persuasive message on any cognitive variable under study, and more to do with prior formation of intentions during or immediately following the presentation of the message.

Though there were no main effects of implementation intention, the effects of the manipulation could be seen through its moderating effect on the relationship between intentions and behavior. Though intentions to donate blood and implementation intentions themselves had no significant correlations with attending a blood drive, there was a significant interaction between intentions and implementation intention in that participants who made a plan to attend a blood drive were more likely to attend a blood drive as their level of intention to do so increased. This relationship was not found among participants who did not make a plan to attend a blood drive. A recent study (Sheeran et al., 2005) has reported similar results wherein it was demonstrated that implementation intentions are more effective for participants who have higher intentions to engage in a

target behavior. As goal intentions increased, so did the predictive validity of implementation intentions. Sheeran's results and the present findings are similar in that there was an interaction effect found in both cases. However, the question persists as to whether it is an implementation intention that leads to more predictive validity in the intention variable, or if it is higher levels of intention that lead to more a significant effect of the implementation intentions. In the present study, there was no main effect of implementation intentions on levels of intentions to donate blood. The main effect of implementation intention on intentions could not be ascertained in Sheeran's study as the manipulation came after goal intentions were measured. However the authors reported other studies that have consistently shown that there is no relationship between implementation intention and motivational variables (Milne, Orbell, & Sheeran, 2002; Sheeran & Orbell, 1999). Certainly it has been demonstrated that the higher one's goal intention, the more effective the implementation intention. However, an implementation intention may have its effect on the relationship between intentions and behavior for persons past a certain threshold of goal intention, in that the presence of an implementation intention will strengthen the correlation between intention and behavior. It is not necessarily that implementation intentions have no effect on the intention variable in and of itself. Rather, the implementation intention has its effect vis-à-vis the relationship on the causal relationship between the intention variable and the subsequent behavior.

Self-Identity and Commitment

The measure of self-identity had some predictive utility when it was entered into the prediction of intention together with attitudes, subjective norms and perceived

behavioral control. However, when the commitment variable was entered into the equation, the self-identity variable was no longer significant, suggesting a full mediation by commitment. Criticisms that the self-identity variable is indeed a measure of behavioral intentions seem pertinent when considering the full mediation by a variable that is highly related to intentions, namely commitment to the behavior.

Contradicting this consideration however, the results of the second-order confirmatory factor analysis exploring the relationship between commitment, intentions and self-identification suggested that a model wherein the self-identification variable was not stemming from the same underlying latent variable as commitment and intention was more appropriate when taking into account the model fit statistics. The measure in itself may well be capturing something distinct from intentional and motivational variables. This adds to discussions concerning the addition of self-identity to the theory of planned behavior, lending evidence that the construct is distinct from intentions. Given its full mediation by commitment however, an exploration into the relationship between commitment and behavioral intention seems a necessary precursor to the consideration. Unfortunately, though satisfactorily reliable, the measure of commitment used in this study was not unidimensional as revealed in a principal component analysis. An effort to create a reliable unidimensional measure for commitment and to explore its relationship with intentions in the context of the theory of planned behavior is therefore suggested as a necessary research avenue.

A measure of discrepancy between one's perception of a prototypical person who engages in a particular behavior and one's self was utilized in a previous study (Pierro, 2003) in an attempt to circumvent criticisms of the self-identity variable. Data from this

study however raises the question as to whether these two methods of measuring self-identity are indeed synonymous. Given the low correlation between the self-identity variable and the identity discrepancy variable ($r=0.246$), as well as the fact that self-identity predicted intention whereas identity discrepancy did not, a conclusion that they are measuring two distinct attributes is warranted.

Conclusion

Given that the manipulations did not have their intended effect on blood donation intentions or behavior, no firm conclusions can be drawn at this time regarding cognitive underpinnings of the potential joint effects of persuasive messages and implementation intentions on behavioral engagement. The lack of variance in the outcome behavior proved a statistical hindrance to establishing sound empirical relationships. Very few participants in the present study actually participated in the blood drive.

A direct comparison between two alternate measures of self-identity, namely the direct assessment involving asking participants how they identify with a behavior versus a discrepancy measure, gives credence to the strength of direct assessment. Though the relationship between self-identity and intentions to engage in a behavior was statistically established, this behavior was mediated by commitment to the behavior.

Future research wishing to explore the place of commitment within the theory of planned behavior would do well to develop measures that capture a single dimension of commitment. As such, it is worth considering the question “To what is a participant expressing commitment?” Commitment to one’s intention in contrast to commitment to one’s behavior may be two distinct dimensions of commitment whose relationships are worthwhile to explore within the planned behavior context.

The results lend empirical support to the interaction between implementation intentions and goal intentions. Intentions to donate blood were shown to be related to a higher likelihood of attending a blood drive, but only among participants who formed implementation intentions. This result still raises theoretical questions regarding the causal direction of the interaction. Is it the implementation intention that is doing the moderating or is it the goal intention? Either alternative is statistically and theoretically plausible depending on how the interaction is defined. Structural regression modeling techniques offer means of exploring the relationship between implementation intention, goal intentions and behavior in which mediating and moderating effects of implementation intentions may be explored and compared to mediating and moderating effects of goal intentions in alternative models.

In previous research, there has been evidence for the efficacy of persuasive messages, as well as evidence for the effectiveness implementation intentions. The cognitive route through which these two manipulations may work in tandem to effectively induce people to engage in desired behaviors remains elusive, and in doing so offers an area ripe for exploration.

Table 1: Descriptive statistics

	Mean	SD	Att	SN	PBC	Int	Com	ID Disc	Self ID
Att	4.695	1.738	<i>0.756</i>						
SN	4.453	0.961	0.529	<i>0.570</i>					
PBC	5.139	1.337	0.564	0.429	<i>0.747</i>				
Int	4.061	1.817	0.770	0.489	0.602	<i>0.939</i>			
Com	4.739	1.063	0.528	0.486	0.162*	0.574	<i>0.694</i>		
ID Disc	0.337	0.741	0.278	0.272	0.351	0.226**	0.102*	<i>0.697</i>	
Self ID	3.886	1.069	0.519	0.350	0.200*	0.522	0.659	0.246**	<i>0.694</i>

Reliabilities given in the diagonal.

All correlations significant $p < 0.01$ except as noted;

* = ns

** = $p < 0.05$

Table 2: Theory of planned behavior ordinary least squared and binary logistic regressions.

DV = Intention					
	Coef	se	Beta	Significance	R²
Attitude	0.931	0.128	0.602	<0.001	
Subjective Norm	0.136	0.143	0.072	0.345	
Perceived Behavioral Control	0.315	0.106	0.232	0.004	0.638
DV = Attended Blood Drive					
	Log-odds	se	Odds ratio	Significance	Model χ^2
Intention	0.433	0.265	1.542	0.102	
Perceived Behavioral Control	-0.718	0.301	0.488	0.017	6.195*

* p<0.05

Table 3: Step wise regressions predicting intention

		Coef	se	Beta	p-value	R²	F change	Sig F Change
<i>Step 1</i>	Att	0.931	0.128	0.602	0.000			
	SN	0.136	0.143	0.072	0.345			
	PBC	0.315	0.106	0.232	0.004	0.638		
<hr/>								
<i>Step 2</i>	Att	0.670	0.136	0.433	0.000			
	SN	-0.047	0.141	-0.025	0.741			
	PBC	0.424	0.102	0.312	0.000			
	Self ID	0.125	0.137	0.074	0.365			
	Com	0.442	0.148	0.259	0.004	0.696	8.933	0.004

Table 4: Step-wise logistic regression testing the moderating effect of implementation intention on intention, perceived behavioral control and behavior.

		Log-odds	se	Odds ratio	p-value	Model χ^2	df	χ^2 p-value
<i>Step 1</i>	Int	0.433	0.265	1.542	0.102			
	PBC	-0.718	0.301	0.488	0.017			
	Constant	-2.208	0.397	0.110	0.000	6.195	2	0.045
<i>Step 2</i>	Int	0.465	0.268	1.592	0.083			
	PBC	-0.761	0.307	0.467	0.013			
	II	-0.682	0.746	0.505	0.360			
	Constant	-1.927	0.477	0.146	0.000	7.065	3	0.070
<i>Step 3</i>	Int	-0.113	0.383	0.893	0.768			
	PBC	-1.008	0.38	0.365	0.008			
	II	-0.649	0.91	0.523	0.476			
	II x Int	1.196	0.537	3.305	0.026			
	Constant	-2.358	0.642	0.095	0.000	13.328	4	0.010
<i>Step 4</i>	Int	-0.113	0.391	0.893	0.773			
	PBC	-1.009	0.483	0.365	0.370			
	II	-0.651	1.128	0.521	0.564			
	II x Int	1.194	0.724	3.300	0.099			
	II x PBC	0.003	0.781	1.003	0.997			
	Constant	-2.356	0.728	0.095	0.001	13.328	5	0.020

Int = Intention

PBC = Perceived Behavioral Control

II = Implementation Intention

II x Int = Interaction (Implementation Intention by Intention)

II x PBC = Interaction (Implementation Intention by PBC)

Table 5: Chi-square difference model comparisons for implementation intention interaction step-wise logistic regressions.

	χ^2	df	$\Delta \chi^2$	Δdf	p-value
<i>Step 1</i>	6.195	2			
<i>Step 2</i>	7.065	3	0.87	1	0.351
<i>Step 3</i>	13.328	4	6.263	1	0.012
<i>Step 4</i>	13.328	5	0	1	<i>na</i>

Figure 1: Theory of Planned Behavior

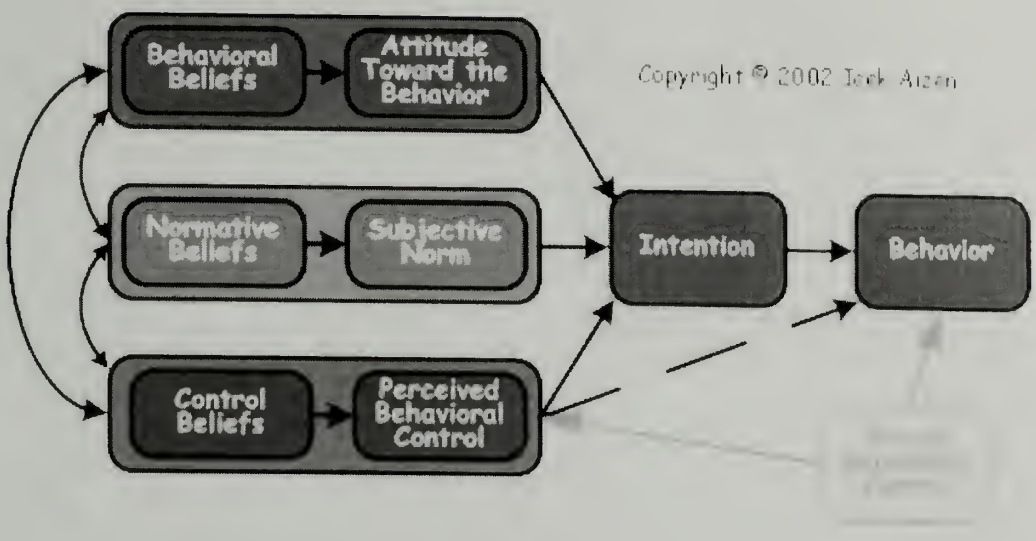


Figure 2: Proposed path model for joint effects of persuasion and implementation intention.

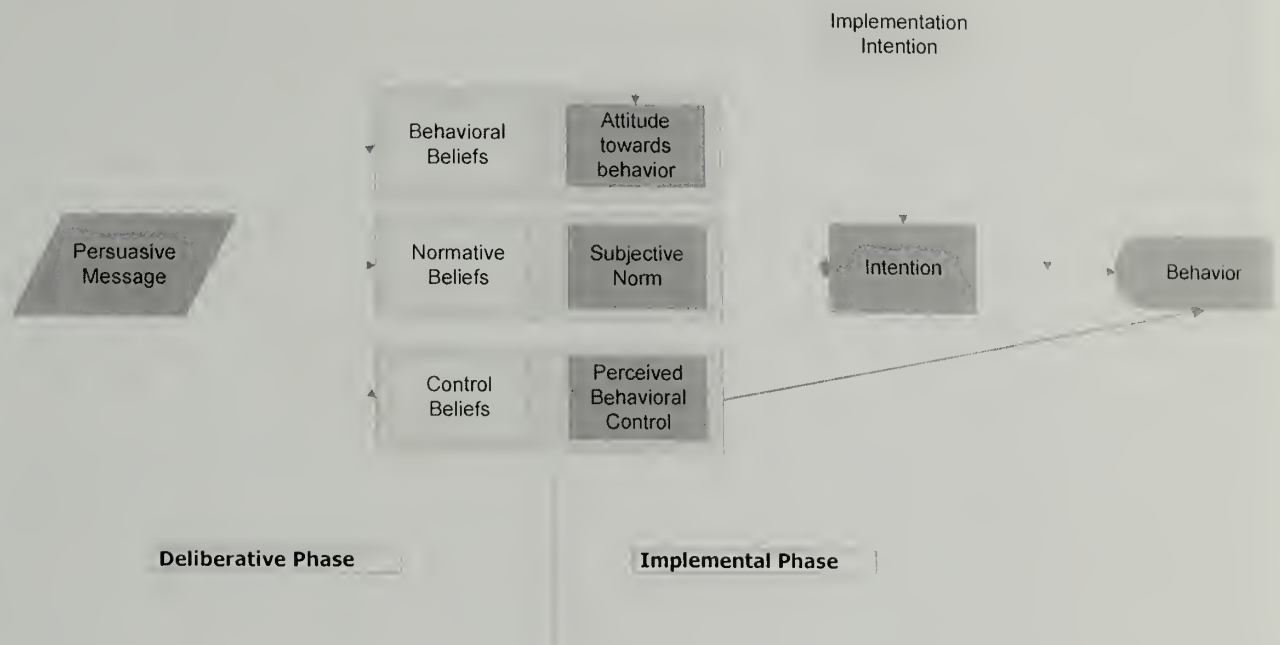
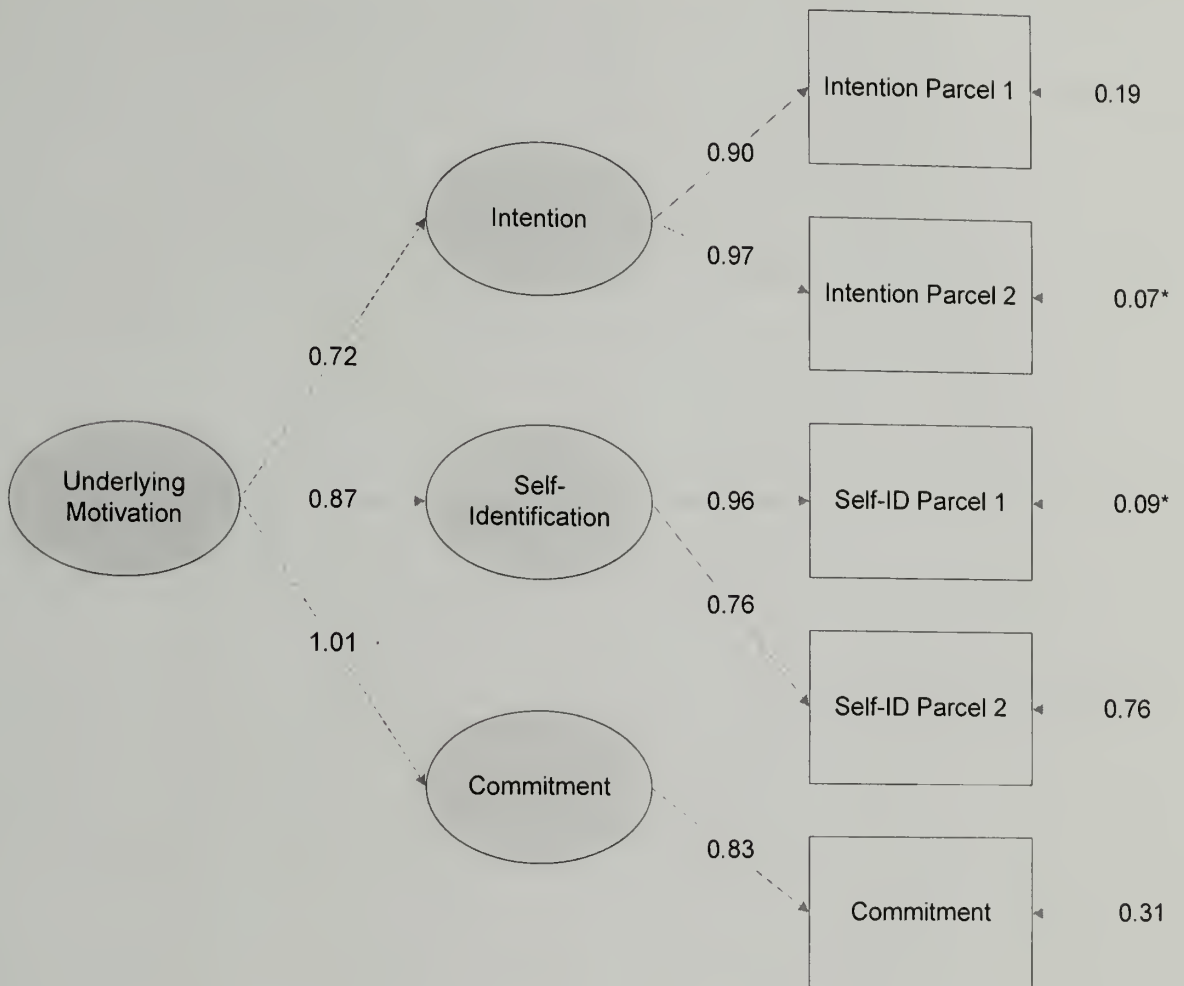
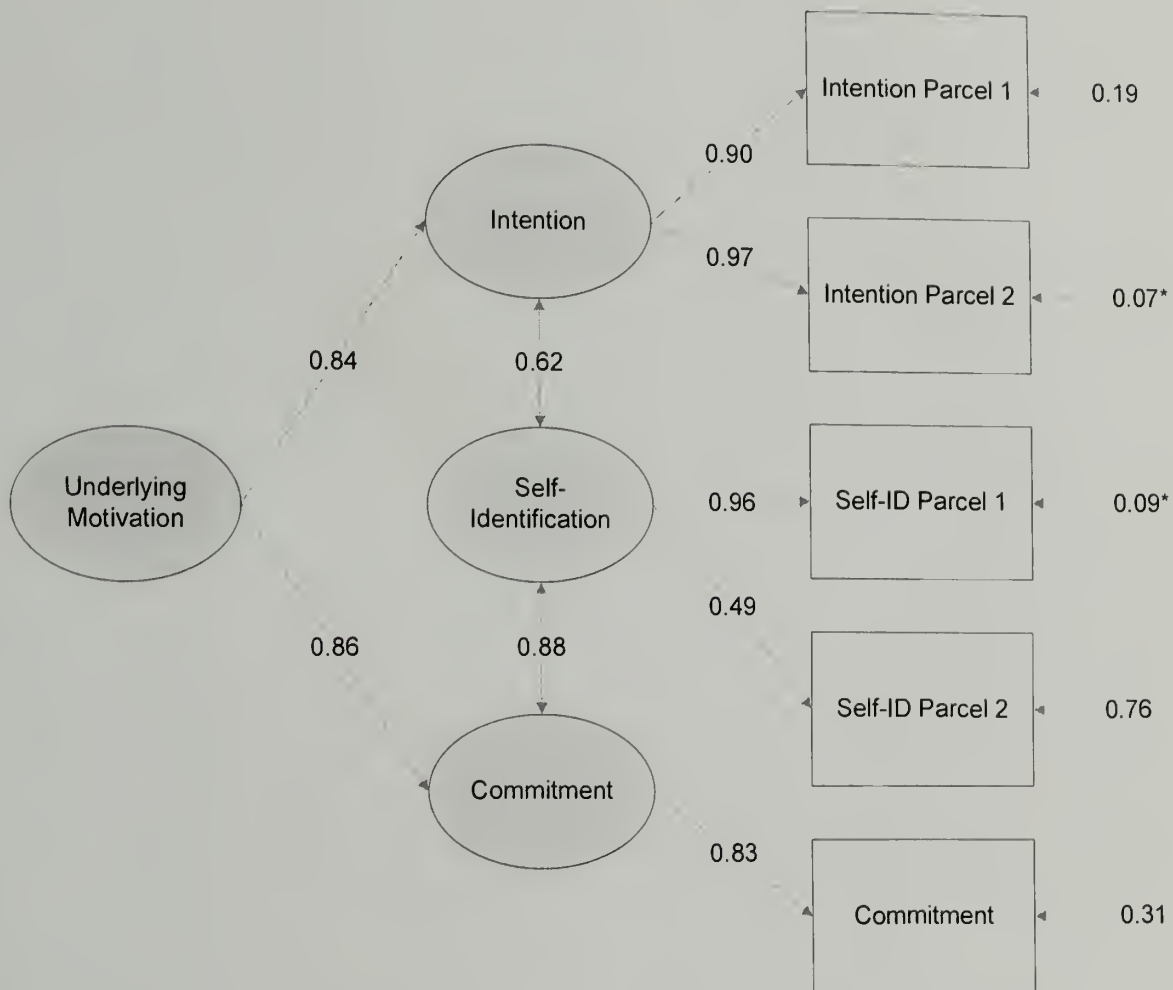


Figure 3: Second order CFA; Relation of Intention, Self-Identification and Commitment to Underlying Motivation (Full Model)



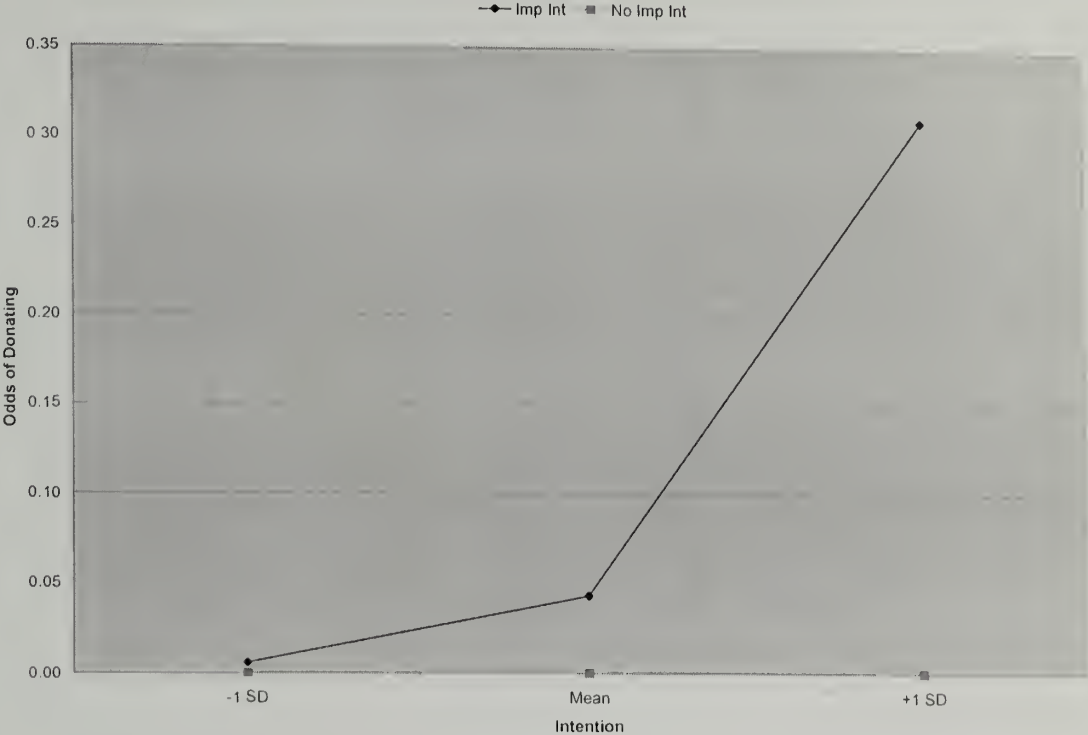
($\chi^2=15.664$, $df=3$, $p<0.01$; RMSEA = 0.212; CFI = 0.965)

Figure 4: Second order CFA; Relation of Intention, Self-Identification and Commitment to Underlying Motivation (Alternative Model)



($\chi^2=0.099$, $df=2$, $p>0.9$; RMSEA = 0; CFI =0.961)

Figure 5: Implementation Intention moderating the relationship between intention to donate and odds of attending blood drive.



APPENDIX A

ADJECTIVE PAIRS FOR ADJECTIVE TASK

1. Happy – Sad *
2. Outgoing – Reserved
3. Conscientious – Lackadaisical *
4. Greedy – Benevolent
5. Generous – Stingy
6. Dishonorable – Honorable *
7. Pure – Impure *
8. Dirty – Clean *
9. Good – Bad *
10. Crude – Civilized
11. Decent – Indecent
12. Excitable – Calm

* Adjectives used in final discrepancy scale

APPENDIX B

COMPONENT LOADINGS AND PARCELS ASSIGNMENTS.

Intention:

Item	Loading	Parcel
1	0.912	2
2	0.828	1
3	0.889	1
4	0.947	1
5	0.912	2

Self-identification

Item	Loading	Parcel
1	0.482	1
2	0.493	1
3	0.811	1
4	0.682	2
5	0.755	2

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