

The effects of implementation intentions on relationship maintenance responses

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Abstract

Participants in committed relationships may frequently encounter interpersonal adversity. Research has shown that committed partners use relationship maintenance responses to reduce relationship threat in these situations while strengthening relationship commitment. A study was conducted to determine the effects of a relationship-defending implementation intention on three computerized tasks measuring relationship maintenance responses; gender, commitment level, and demographic information were analyzed as covariates. It was found that male and female participants differed in relationship maintenance responses, and that the formation of an implementation intention may cause individuals (particularly men) to defend their current relationship in implicitly relationship-threatening situations. Practical and academic implications of these results, including clinical possibilities and directions for subsequent studies, are discussed.

Introduction

Interpersonal relationships are an integral part of our social lives. In actuality, the perpetuation of our species as a whole is moderated by relationships between compatible human adults. As inevitable as these relationships seem to be, however, adversity within them seems equally prevalent. By extension, any analysis of romantically committed dyads in general cannot be considered comprehensive unless it examines the factors and effects of adversity within them.

Although these relationships have defined our collective existence, objective scientific analysis of the subject is recent, and a working understanding of how our relationships function is elusive. Current research has shown that the success of interpersonal relationships is moderated by commitment between relationship partners, relationship maintenance strategies employed, reactions to others outside of the relationship, and plans and goals regarding the relationship's future (Johnson & Rusbult, 1989; Johnson, 1991; Rusbult, Wieselquist, Foster, & Witcher, 1999; Gagne & Lydon, 2001).

According to Johnson (1991), commitment is composed of three aspects: personal, moral and structural. The externally based structural component represents the influence of one's relationship status on one's commitment to that relationship. In contrast, personal and moral aspects of commitment are internally based. Personal commitment results from one's desire to remain in a relationship due to the satisfaction experienced as part of it. Finally, moral commitment is the perception of an obligation to remain in a relationship for moral reasons.

Individuals in a committed dyad act to defend their relationship by using relationship maintenance strategies in *Corresponding author. E-mail: ianmahar@gmail.com March 2007 • msurj.mcgill.ca response to adversity (Rusbult et al., 1999; Brehm, Miller, Perlman, & Campbell, 2002). One important relationship maintenance response involves devaluation of relationship alternatives. Johnson and Rusbult (1989) established that there exists a negative linear correlation between commitment to a romantic relationship and the evaluation of attractive alternatives. They found that in couples whose commitment increased over time, ratings of attractive alternatives decreased, whereas in couples that became less committed over time, ratings of alternatives increased. Johnson and Rusbult also found that alternatives were more strongly devalued if they were extremely attractive, representing a "high threat" condition.

According to the commitment calibration hypothesis, the effects of adversity within a relationship are contingent upon the level of commitment present in that relationship (Lydon, Meana, Sepinwall, Richards, and Mayman, 1999; Pearson, 2004). If the adversity level surpasses the level of commitment, the relationship cannot survive, and if the adversity level is lower than the commitment level, the relationship does not experience a threat. However, if the levels of relationship commitment and adversity are comparable, the relationship will resist the threat and become stronger. Lydon et al. tested this theory with a study in which participants in committed relationships were exposed to varying degrees of relationship "threat". This threat was presented in the form of attractive alternatives, following the paradigm developed by Johnson and Rusbult (1989). Participants who were moderately committed and were presented with a moderate threat (evaluating an attractive alternative who ostensibly did not rate the participant) rated the alternative lower in attractiveness than participants who were either less or more committed. Highly committed participants who were presented with a highly threatening situation (evaluating an attractive alternative who was ostensibly attracted to the participant) evaluated the alternative as less attractive than participants who were less committed to their romantic relationships. The commitment calibration hypothesis explains Simpson, Gangestad, and Lerma's (1990) findings that romantically involved individuals gave lower attractiveness ratings to photographs of attractive alternatives in comparison to the ratings of single individuals.

Relationship maintenance responses have recently been linked with the concept of implementation intentions (Lydon & Miners, 2001; Lydon & Nguyen, 2004). According to Gollwitzer (1999), implementation intentions are plans formed in order to associate upcoming goal-related situations with goal-related actions that must be performed. Gollwitzer and Brandstatter (1997; Gollwitzer, 1999) have suggested that implementation intentions reduce or eliminate obstacles preventing goal completion, and that the initiation of goaldirected action will then occur automatically when the goalrelated situation is presented. Webb and Sheeran (2004) confirmed this suggestion, showing that the formation of an implementation intention led to quicker and more accurate responses to goal-related cues. These studies suggest that forming an implementation intention increases the probability of an individual detecting the correct time and action necessary to act toward their goal.

Lydon and Miners (2001) were among the first to investigate the connection between implementation intentions and relationship maintenance responses. This study bore three relevant findings. First, the commitment level of males was found to be lower than that of females, which was unusual. Second, in a computerized image-distancing task, male participants moved a picture of an attractive female closer to themselves than female participants (who moved a picture of an attractive male). Finally, participants who had formed an implementation intention to defend their current relationship kept an image of an attractive alternative closer to neutral images (but further from themselves) in the image distancing task, suggesting reduced cognitive awareness of the threat, whereas other participants placed the image of the attractive alternative further from neutral images (but closer to themselves). However, this study was limited by a relatively small sample size and methodological issues.

The present study analyzes how forming an implementation intention regarding one's own romantic relationship affects relationship maintenance responses, and is intended primarily as a replication of the Lydon and Miners (2001) study, with the aforementioned limitations corrected. Participants in committed relationships formed an implementation intention to either augment their study habits (the control condition) or defend their relationship (the experimental condition). It was hypothesized that participants in the experimental condition would react more quickly and accurately than control participants to stimuli related to relationship commitment in a lexical decision task, as would women in comparison to men, and highly committed participants in comparison to those less committed. Further, it was believed that experimental condition participants would show decreased preference for a virtual space associated with an attractive alternative compared to control participants, as would highly committed individuals in comparison to those less committed. Finally, it was hypothesized that experimental condition participants would place the image of an attractive alternative further away (but closer to neutral images) compared to control participants in an image distancing task, that highly committed participants would push the attractive alternative further away than other participants, and that men would bring the attractive alternative closer than the neutral images, whereas women would push the attractive alternative further away.

Method

Participants

Participants were males (N=20) and females (N=20) between the ages of 17 and 26 (M=19.38, SD=1.31) who had been dating their current partner for between 1 and 72 months (M=17.98, SD=15.87). Participants were McGill University students (with the exception of one male Concordia University student) who were currently in committed heterosexual relationships, and were fluent in English (self-reported English proficiency on a scale from 1=poor to 7=excellent: M=6.35, SD=0.80). Participants were recruited by phone and email from the McGill psychology subject pool.

Materials

At least two days before testing in the lab, participants completed two questionnaires hosted online at www.survey monkey.com; these measures included a modified version of the Commitment Evaluation Questionnaire (CEQ) created by Lydon and Miners (2001). The modified CEQ contained the original 15 items (assessing commitment, investment, devotion, loyalty, and dedication towards one's academic, romantic and social life), and added three new items regarding attachment and obligation.

Participants were given a consent form to be signed, which stated that they were aware that all responses were confidential, and that they were free to leave at any time or refuse to answer any questions. Participants were then presented with the implementation intention materials. Four scenarios were prepared; each scenario involved the participant imagining themselves in a given situation, and being asked to form an implementation intention in response to this situation. Each scenario also contained a series of questions assessing the ease and vividness of mental simulation, as well as affect during simulation.

In the male and female experimental condition scenarios, the participant was asked to imagine that their significant other is away visiting family, while the participant is at a bar with friends. In these scenarios, the participant's friends tease him or her about being "single for the weekend", and mention that one of their significant other's attractive friends is very interested in meeting the participant. The participant is then asked to imagine this attractive alternative flirting with them at the bar, consider the situation and write how they will show the attractive alternative that they are not interested in them. In the male and female control scenarios, participants are asked to imagine that their significant other is away visiting family, while the participant is attending a movie with friends.

During the scenario, the friends tease the participant about their recent poor performance on an exam. The participant is then asked to imagine that he or she is in the library studying for an upcoming exam, and to write down how he or she would deal with becoming distracted while studying. All scenarios differed in word count by less than 1%.

For the computerized tasks, the software used for the lexical decision task was e-PRIME, while the balloon placement and image distancing tasks used World Tool Kit 2.0; both programs were designed for the Windows operating system. To perform these tasks, participants used a PC terminal running the Windows OS, including a monitor and keyboard. All of the images used were 225 pixels in length and width.

Following the tasks, participants were given a two-part "funnel debriefing" intended to ascertain the participant's perceptions during the experiment; an example question is, "Did you have any specific strategies or reasons for arranging the images the way you did?" The final questionnaire asked the participant for demographic information such as age, gender, sexual orientation, relationship length, first language, and proficiency in English. The final material distributed was a written debriefing outlining the purpose and experimental manipulation of the study, and also contained the experimenter's contact information.

Procedure

Participants were randomly assigned to either the experimental or control condition prior to testing. Participants were first asked to read and sign the consent form, and then given five envelopes, ostensibly containing five different scenarios, but in fact all containing the scenario assigned to that participant's condition. The five hypothetical scenarios supposedly were studying for an exam, shopping for clothes, athletic performance, an evening at a bar, and going on a vacation. Participants were given five minutes to complete this portion of the study.

Participants were then asked to complete three computerized tasks. In the first task, 64 strings of letters appeared, half of which were actual words and half of which were nonwords (actual words with one letter replaced, forming a nonsensical string). There was a 2500 ms delay between strings, during which participants focused on an asterisk which appeared on the monitor. Participants were asked to determine if each string of letters was either a word or a non-word as fast as possible by pressing designated "word" and "nonword" keys, and were also asked to keep their index fingers over the two keys at all times to ensure that responses were as quick as possible. Participants were told that response time and accuracy would be recorded. Four words previously found to be prototypical of commitment (Fehr, 1988; Rosch, 1973) (such as "dedication" and "devotion") were randomly interspersed among the strings of letters. The remaining strings consisted of four neutral non-interpersonal words, two negative non-interpersonal words, two positive non-interpersonal words, four synonyms for the word "defend", and sixteen non-words (Lydon & Miners, 2001; Lydon & Nguyen, 2004). All words were selected from Anderson's (1968) list of 555 personality-trait words.

During this lexical decision task, participants were subliminally presented with an image of an attractive alternative, which remained on the computer monitor for 10 milliseconds. These images were followed immediately by the presentation of a mask (composed of gray curved lines) for 20 ms, in order to disrupt conscious perception of the attractive alternative. There were 16 images of attractive alternatives in total (eight males and eight females), which had been rated on a seven-point scale that ranged from not at all attractive (1) to extremely attractive (7) by 20 impartial judges prior to testing. Female judges rated the attractiveness of the male images (M=5.88), and male judges rated the attractiveness of female images (M=5.92) (Lydon & Miners, 2001). The first block of trials presented 32 images of males in a random sequence and the second block, 32 images of females; transition between the two blocks was seamless. Presentation of opposite-sex images was intended to prime the concept of attractive alternatives within the participant, whereas same-sex images were considered neutral.

Following the lexical decision task, participants entered a virtual environment program containing one large hall with four small identical rooms. Participants were asked to thoroughly explore each of the four rooms, using the arrow keys on the keyboard, before returning to a small table in the center of the hall. In two of these rooms (randomly selected by the software), the image of an attractive alternative (of the opposite sex of the participant) was automatically presented for 10 ms upon advancing past a certain point in the room, followed immediately for 20 ms by a "retinal disruption" mask. The remaining two rooms presented only the mask. The mask (an improved version of the mask used by Lydon and Miners (2001)) appeared as four horizontal lines interrupted by assorted geometric shapes, and was of identical size to the

attractive alternative image. The purpose of this mask was to minimize recollection of the subsequent image at a conscious level, by disrupting the image on the retina. After participants had explored each room and returned to the table, a robotic arm appeared in front of the participant, and a balloon appeared over the table. Participants used the robotic arm to grab and place the image of the balloon in one of the rooms, using the "space" key. The prevalence of balloon placement within the "target" rooms that had presented the image of the attractive alternative was recorded.

Lydon and Miners (2001) encountered a computer error in which participants did not adequately explore each room, which prevented images from appearing. This was corrected in the current study by updating the instructions presented to participants, who were specifically asked to enter each room completely before moving on. Also, the image of the male attractive alternative was replaced (with a new male image selected by impartial raters) for the balloon placement and image distancing tasks, as it was believed (from the results of a pilot study) that the previous image would not be considered sufficiently attractive to female participants.

In the final computer task, eight images were positioned in a circle around the participant's position in virtual space. Participants were able to move each image closer (by pressing the "down" arrow key) or further away (by pressing the "up" key) in order to create an arrangement they were content with. One of these images was a picture of an attractive alternative (the "target" image) of the opposite sex of the participant, whereas the other images were of animals, fruit, and other neutral objects. The distance to which each image was moved in relation to a participant's virtual position was recorded by the software.

Following the image distancing task, participants were given the funnel debriefing and the demographic questionnaire, and were given a written and oral debriefing explaining the true nature of the experiment. Participants were then thanked for their participation and compensated with a movie pass valued at approximately \$10.

Results

Contrary to the results of the Lydon and Miners (2001) study, commitment levels of male participants (M=4.03) and female participants (M=4.69) obtained from the modified CEQ did not differ significantly (t(35)< 1). Responses to the scenarios revealed that all participants in both experimental groups successfully formed the desired implementation intention, as all participants outlined an implementation intention to deal with their given scenario.

Balloon placement task

25 of the 40 participants placed the balloon in a room in which an attractive alternative was presented, in comparison to the 20 predicted by chance. Men (50% of whom chose a target room) did not differ significantly from women (75%) ($X^2(1)=2.67$, p>.1). Women placed the balloon in a target room more than chance ($X^2(1)=5.0$, p<.05), while men were exactly at chance. There was no difference in the frequency of target room selection of participants in the experimental condition (65%) compared to of control participants (60%) ($X^2(1)<1$). In analyzing the results for a gender by condition interaction, 30% of male experimental participants, 70% of the control males, 90% of experimental females, and 60% of control females placed a balloon in a target room. When aggregated with the data of Lydon and Miners (2001) to increase sample size, experimental participants (43%) were not significantly less likely than controls (60%) to choose a target room ($X^2(1)=2.67$, p>.05). However, when broken down by gender, males in the experimental condition (25%) were less likely than males in the control condition (63%) to choose a target room ($X^2(1)=4.571$, p<.05), whereas women's behavior was random across conditions ($X^2(1)=0$). All participants entered each room far enough to trigger presentation of the intended image(s), as witnessed by the experimenter.

Image distancing task

Males in the experimental condition kept the image of the attractive alternative at approximately the same distance as the neutral images (t(18)<1), as did males in the control condition (t(18)<1). Women in the experimental condition did not move the target image further away than women in the control condition (t(18)=1.136, p>.1), although women in general moved the target image significantly further away from themselves than the neutral images (t(36)=1.768, p<.05). Overall, the target image was moved further away than neutral images, although the result was only marginally significant (t(36)=1.344, p <.1). However, when results were aggregated with those of Lydon and Miners (2001), there was an interaction effect for image and gender (F(1,66)=5.820, p<.025); specifically, women placed the target image further away than men (t(66)=2.534, p<.01).

Debriefing

Funnel debriefing measures revealed that none of the participants correctly guessed the purpose of the experiment or what the experiment was attempting to study. Also, none of the participants were able to correctly identify the images that appeared during the lexical decision task, and many stated that they saw no images at all during this task. Similarly, very few participants were able to identify the content of images in the balloon placement task, and none could describe them accurately. When asked how they arranged the images in the distancing task, the most common strategy described was to move closest those images that were "liked" the most. No participants had prior knowledge of the tasks or methods used in this study.

Discussion

The current study explored whether the formation of an implementation intention affected the relationship maintenance response of devaluing attractive alternatives. The effects of gender and commitment level were similarly examined. It was hypothesized that participants who formed an implementation intention to defend their current relationship would respond more quickly to prototypical commitment words, would be less likely to place a balloon in a target room, and would move an image of an attractive alternative further away from themselves in an image distancing task.

Although the balloon placement task data indicated that men in the experimental condition were less likely to place the balloon in a target room than control males, the effect was not significant. This is likely due to the small sample size. When the data are aggregated with Lydon and Miners' (2001) results of the same task, however, the effect is in fact significant. This indicates that men were influenced by the formation of a relationship-defensive implementation intention to avoid those rooms associated with an attractive alternative. It seems that this behavior is indicative of these men augmenting their relationship maintenance responses to adversity as a result of the experimental manipulation.

The results of the image distancing task suggest that the formation of an implementation intention did not significantly affect relationship maintenance responses for this explicit task. Although women in general moved the target image further away from themselves than neutral images, women in the experimental condition did not move the attractive alternative further away than women in the control condition, and men in both conditions kept the target and neutral images at relatively the same distance.

The current study replicated the finding of Lydon and Miners (2001) that men and women do not respond equally to relationship threat (shown by the gender differences in task results). Lydon and Miners suggest that this difference occurs because men and women differ in their self-concepts, in that women have a more interdependent self-concept, whereas men have a more independent self-concept. This difference could cause the aforementioned difference in response to relationship threat, as women would be more likely to defend a relationship that they believe contributes to their interdependent self-concept. Particularly interesting is the fact that the experimental manipulation did not affect performance for the *explicit* distancing task, but had a significant effect on men in the *implicit* placement task. These results support the hypothesis of Lydon (submitted) that committed women already have a chronic internal contingency plan for dealing with situations that are threatening to their relationships, whereas committed men do not; in the current study, it seems that the formation of a relationship-defending implementation intention in men served the same purpose as the pre-existing contingency plan of women.

Limitations

The scope of the current study is limited by several factors. All participants were relatively young (18-23 years of age), reducing the generalizability of these results to older individuals. In addition, participants were undergraduate students, predominately attending McGill University. Results of the current study might not be characteristic of individuals with a different educational or socioeconomic background than the average undergraduate. Because the experimenter was male, it is possible that male and female participants' responses differed as a result. Finally, the current study was limited to individuals in heterosexual relationships, limiting the generalizability to gay, lesbian and bisexual relationships.

Of the individuals indicating an interest in participating, 60 completed the online survey, and only 40 of these respondents were tested in the lab. This may have resulted in a recruitment bias in the results, as less interested individuals may have been less likely to complete the survey, and the most interested subjects may have responded earlier.

In attempting to replicate the results of Lydon and Miners (2001), it was necessary to maintain several methodological issues limiting the predictive power of the results. As all participants experienced the computerized tasks in the same sequence, it is possible that order effects exist. For example, the commitment words in the lexical decision task could prime for commitment in participants, affecting the results of the subsequent tasks. Similarly, since the blocks of images presented in the lexical decision task always occur with male images preceding female images, order effects may exist within this task.

The results of the balloon placement task were aggregated with those of Lydon and Miners (2001) during analysis; as some of their results for this task may have been affected by the aforementioned computer error, the reliability of these data may be reduced. The background of the attractive alternative images was not quite identical, with the male background being slightly lighter in color, potentially making the male image slightly more detectable. This extra salience may have affected the distancing task as well, by reducing the need to bring the male image closer in order to see it clearly. Similarly, although all images were the same size, it is possible that image resolution was not quite identical across all images, potentially causing participants to move lower resolution images closer in order to discern finer detail. Finally, since opinions of what gualifies as "attractive" vary between individuals, it is difficult to find an image that serves as an attractive alternative for all members of a gender.

Implications and future directions

The current study found that the formation of implementation intentions affects relationship maintenance mechanisms in response to relationship threat, particularly in men. It is possible that implementation intentions affect other relationship maintenance responses beside the devaluation of alternatives; if so, members of a committed relationship might deal with other relationship obstacles using a similar strategy.

There are both practical and academic applications for this information. From a research standpoint, the effects of implementation intentions on relationship maintenance responses have only recently been studied, and future research in this area could reveal much about the true nature of interpersonal relationships. Although the current study addresses methodological issues present in previous studies, the design of the current study could still be augmented in future replications. Primarily, increasing the sample size could reveal useful findings. The presentation of images during the lexical decision task could be improved so as to present only male images to female participants and vice versa. The virtual space created for the balloon placement task could also be updated with a more modern interface. Finally, the resolution of the images presented during the experiment could be increased and standardized. Future research could potentially examine the effects of implementation intentions on relationship maintenance responses in gay, lesbian and bisexual relationships as well. The effectiveness of relationship implementation intentions has yet to be fully assessed, as well as their effects on other aspects of relationships.

The practical implications are equally interesting. Relationship therapists could introduce the formation of implementation intentions as a strategy in clinical sessions. Couples in therapy could form implementation intentions to defend their relationship, and potentially limit effects of relationship obstacles in their future. Ideally, this strategy could strengthen existing relationships, reducing the prevalence of divorce. Committed individuals (particularly men) who are tempted by an attractive alternative (or suffer from a "wandering eye") could also benefit from forming implementation intentions to defend their relationship, as the current study suggests they would have reduced cognitive recognition of attractive alternatives in social settings.

Although this area of research has only recently emerged, it shows promise in uncovering new information regarding relationships that comprise a significant part of our daily lives. Adversity is as inevitable in relationships as relationships are inevitable in our social lives, and as such it should be

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