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Cognitive dissonance as an explanation for relationship satisfaction in long distance relationships

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**Cognitive dissonance as an explanation for relationship satisfaction in
long distance relationships**

by

Kelli Anne Gardner

**A dissertation submitted to the graduate faculty
in partial fulfillment of the requirements for the degree of
DOCTOR OF PHILOSOPHY**

Major: Psychology

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Ames, Iowa

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For the Major Program

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ABSTRACT

Two studies examined relationship satisfaction in long distance relationships within the contexts of social exchange theory and cognitive dissonance theory. In study one, subjective and objective costs in relationships were measured over the course of a semester in both long distance and geographically proximal couples. Results suggested that participants in long distance relationships had higher objective and subjective costs than participants in geographically proximal relationships. In both long distance and geographically proximal couples an increase in either objective or subjective costs from time 1 to time 2 was related to a decrease in relationship satisfaction from time 1 to time 2, but the relationship between change in costs and change in relationship satisfaction did not differ by relationship type. Study two attempted to create cognitive dissonance about relationships in both long distance and geographically proximal couples. Although results suggested that people in long distance relationships who experienced cognitive dissonance about their relationships experienced a smaller decrease in their relationship satisfaction scores than members of geographically proximal relationships who experienced cognitive dissonance and members of long distance relationships in the non-dissonance, control condition, the difference was not statistically significant. Implications of these results and suggestions for further testing the applications of social exchange theory and cognitive dissonance theory to the issue of relationship satisfaction in long distance relationships are discussed.

INTRODUCTION

“Parting is such sweet sorrow...”
-William Shakespeare, *Romeo and Juliet*

Long distance romantic relationships are prevalent among college students today. Estimates suggest that at any given time, between 20 and 50 percent of the relationships on college campuses are long distance relationships (Knox, Zusman, Daniels, & Brantley 2002; Knox, 1992.) Long distance relationships are especially prevalent for first-year college students (Aylor, 2003; Knox, 1992). Either one member of the couple moves on to college while the other is still in high school, or the members of the couple graduate from high school together, select different colleges, and are geographically separated.

As Shakespeare aptly noted, geographical distance between two people in love can be painful. Being apart from one’s loved one is difficult under the best conditions, devastating under the worst conditions. A long distance relationship, in which the geographical distance is prolonged and sometimes indefinite, poses a distinct set of challenges and disadvantages to a relationship and the individuals in it. These disadvantages fall into several broad categories. The primary disadvantages are emotional. People in long distance relationships report that they miss their partners and feel lonely without them (Arditti & Kauffman, 2003). Mild depressive affect is common among people who are involved in long distance relationships (Guldner, 1996). Even visits, which one would think should be a positive event in the lives of the relationship members, can be difficult because of the emotions involved. People in long distance relationships report that they often experience emotional highs and lows during visits (Groves & Horm-Wingerd, 1991; Westfield & Liddell, 1982). Reunions, although typically happy occasions, are often accompanied by anxiety and high expectations,

which are not always met. Parting after a visit to return to separate places can be very difficult, and members of long distance couples often dread the impending separation during their visit, unintentionally squandering their precious time together in anxious anticipation.

Another category of disadvantages to long distance relationships is social. Having a social life is complicated by being a member of a long distance relationship. People who are in long distance relationships often report that their social lives are fraught with challenges. When socializing at home, their partners are typically not there, so they must participate in social events as a “single” person despite being in a relationship, which can be uncomfortable. Such awkwardness can eventually result in members of long distance relationships being excluded from couple-oriented social events (Gerstel & Gross, 1982). Finally, long distance partners may miss fun or important events among their network of friends when visiting their partner out of town.

Another set of difficulties for people in long distance relationships involves logistics. When coordinating two schedules of partners who live in two different places, seeing each other involves a great deal of planning. Both people must have free time from work, school, or other obligations, and one partner has to plan a trip. Even phone calls must be planned, with partners comparing schedules to find a time when both are free to talk. Making a long distance relationship work requires a level of planning and organization that is not necessary in geographically proximal relationships.

Long distance relationships can often be difficult financially (Magnuson & Norem, 1999), especially among college students, a population with a relatively meager income (Westfield & Liddell, 1982). Traveling for visits, no matter the mode of transportation, can be expensive. Talking on the telephone, one of the main relationship maintenance practices

for long distance partners (Magnuson & Norem, 1999), can also cost a lot of money.

Members of long distance relationships may have to modify their work lives to accommodate their long distance relationships. Taking a lower paying job that provides more scheduling flexibility or working fewer hours in order to free up time for visits are two examples of how work and potential income may be sacrificed for relationship reasons.

People in long distance relationships must grapple with trust issues to a greater extent than people in geographically proximal relationships (Guldner, 2003). In a long distance relationship, partners spend much of their time away from each other and certainly experience periods of loneliness. It may be tempting for one to commit a transgression in a long distance relationship during a moment of loneliness. Even if one does not feel that being in a long distance relationship increases the temptation to cheat, one's partner might still suspect that cheating is a problem.

Finally, there are costs to the intimacy of a relationship when the members of the couple are separated. Gerstel & Gross (1982) identified many of these costs. Couples who do not live close enough to see each other everyday cannot experience the everyday chatter that often builds intimacy between two people. It is also more difficult to share leisure activities because of the amount of coordinating and planning that is necessary. What little time long distance couples do have together is often spend in structured activities; they are unable to relish quiet time together spent in non-activity, which is an important builder of intimacy. Members of long distance relationships often report a reduced frequency of sexual activity. Sometimes, when the couple is reunited, they must use valuable time getting reacquainted before feeling comfortable enough to interact intimately.

The Satisfaction Question

Relationship researchers have constructed a theory of relationship satisfaction that integrates social exchange theory (Thibault & Kelly, 1959) and Rusbult's investment model (Rusbult, 1980). According to these theories, satisfaction in a relationship is based on three key variables. The first, rewards, refers to any characteristics of the partner or relationship that are pleasant, beneficial, or in any other way positive. Examples of rewards include enjoying a partner's sense of humor or leisure activities together. The second variable, costs, is just the opposite—characteristics of the partner or the relationship that are in any way unpleasant, disadvantageous, or negative. Examples of costs include a partner's annoying behaviors or conflict in the relationship. Finally, the third variable is the comparison level, which includes what each partner expects of the relationship. The comparison level is influenced by past relationships and other relationships to which the current relationship is being compared, such as the relationships of peers.

According to social exchange theory, high relationship satisfaction occurs in relationships with high rewards and low costs. To the extent that rewards in a relationship increase, relationship satisfaction will increase, whereas an increase in costs should correspond to a decrease in relationship satisfaction. Finally, the lower the comparison level, the higher relationship satisfaction should be. People with very low expectations for their relationships will very likely find that their current relationship fulfills those expectations. People with high expectations, on the other hand, should find that their relationships have a hard time measuring up to their lofty ideals.

The social exchange theory of relationship satisfaction has been fairly consistently upheld by empirical tests. For example, Rusbult (1980b) had participants rate the costs,

rewards, and satisfaction with a close friendship and found that satisfaction was positively related to rewards and negatively related to costs. A longitudinal study of heterosexual dating relationships found that rewards were positively related to relationship satisfaction at time 1 and time 2, and costs were negatively related to relationship satisfaction at time 2 (Rusbult, 1983). In another study by Rusbult (1980a), both rewards and costs were significant predictors of relationship satisfaction in a sample of college students in dating relationships.

Social exchange theory has been applied to satisfaction with the sexual aspects of dating relationships as well, via the Interpersonal Exchange Model of Sexual Satisfaction, a modification of social exchange theory and the investment model. Byers, Demmons, and Lawrance (1998) studied sexual satisfaction in college students and found that a high level of sexual rewards relative to the level of sexual costs resulted in higher levels of sexual satisfaction. In a longitudinal study of a community sample of persons involved in a long-term sexual relationship, Lawrance & Byers (1995) found that level of sexual rewards was positively correlated with sexual satisfaction, both at baseline and three months later. Also as expected, level of sexual costs was negatively correlated with sexual satisfaction at both time points. The levels of rewards and costs are predictive of satisfaction across a variety of interpersonal constructs.

Given the increased emotional, social, logistical, financial, and trust costs inherent in long distance relationships, social exchange theory predicts that people in long-distance relationships will be less satisfied than people in geographically proximal relationships. However, this is not the case. Many studies have shown that long distance relationships are rated as being just as satisfying as geographically proximal relationships. For instance,

Dellman-Jenkins, Bernard-Paolucci, and Rushing (1994) and Timmerman (2001) found no significant difference between the satisfaction levels of people in long distance relationships and geographically proximal relationships. In another study, Guldner and Swenson (1995) found that "...individuals in long distance relationships report levels of relationship satisfaction...that are identical to those reported in individuals in [proximal relationships], despite seeing each other on average only once every 23 days" (p. 318). A fourth sample, of married couples who were geographically separated, found that the marital adjustment ratings of separated and non-separated couples were not significantly different (Govaerts & Dixon, 1998). Stafford & Reske (1990) reported that students in long distance relationships actually rated their relationships as *more* satisfying than students in proximal relationships. Finally, two separate samples taken from a mass data collection from undergraduates at Iowa State University both found that relationship satisfaction did not differ for proximal versus long distance relationships (Gardner, unpublished data).

Two studies found results somewhat different from this pattern. Holt & Stone (1988) found that, as long as the long distance couple got to visit each other at least once a month, their satisfaction levels did not differ from unmarried couples who lived together. However, relationship satisfaction was lower for members of long distance relationships who saw their partner less frequently than once a month. Finally, Van Horn and colleagues (1997) sampled college students and found that satisfaction levels of geographically proximal couples were higher than those in long distance relationships. Across nine samples that examined relationship satisfaction in long distance and geographically proximal couples, the Van Horn study is the only one that found that people in long distance relationships were less satisfied.

To be certain that the lack of difference in relationship satisfaction between long distance relationships and geographically proximal relationships was not due to insufficient power to detect significant differences, I conducted a meta-analysis across studies. Three of the studies (Holt & Stone, 1988, Dellman-Jenkins et al, 1994, and Govaerts & Dixon, 1998) did not provide the information needed to compute effect sizes. For the other six samples, an effect size coefficient was computed. The effect size represents the difference in relationship satisfaction between long distance relationships and geographically proximal relationships in standard deviation units. Once an effect size coefficient was computed for each sample, each sample's coefficient was weighted by its sample size. Then, the samples' weighted effect size coefficients were combined and averaged to provide an overall effect size statistic. This effect size was 0.002. Cohen's (1992) criterion for a small effect size is 0.2. An effect size statistic of 0.002 indicates an imperceptibly small difference in satisfaction between the two types of relationships.

Table 1: Meta-analysis of satisfaction in long distance relationships

SOURCE	LDR	NonLDR	d
Gardner n = 464	4.24 (0.71)	4.29 (0.72)	-.06
Gardner n=316	4.34 (0.69)	4.23 (0.79)	.14
Timmerman n=373	5.54 (1.43)	5.75 (1.28)	-.15
Stafford n=142	119.12 (15.37)	108.77 (16.58)	.64
Guldner n=384	41.7 (6.40)	41.4 (6.70)	.04
Van Horn** n=162	3.39 (1.00)	3.81 (1.10)	-.39
OVERALL			.002

According to the predictions of social exchange theory (Thibault & Kelley, 1959) and the investment model (Rusbult, 1979), relationships that are high in costs should be less satisfying than relationships that are low in costs. Long distance relationships have a higher level of costs than geographically proximal relationships, for reasons already explained. Therefore, long distance relationships should be less satisfying than geographically proximal relationships. However, a thorough narrative and meta-analytic review of the literature does not support this prediction. People in long distance relationships are simply not less satisfied than people in geographically proximal relationships.

Explanations

Why do people in long distance relationships have similar levels of relationship satisfaction as those in geographically proximal relationships, despite the inherent disadvantages of long distance relationships? An effort justification process could account for this finding. Festinger (1957) first discussed the ideas of cognitive consistency and cognitive dissonance. In short, cognitive consistency is the idea that individuals desire their thoughts to be consistent with their behaviors. If an individual performs a behavior that is inconsistent with one of his or her thoughts, cognitive dissonance ensues. The individual will become unpleasantly aroused, and the arousal will persist until the dissonance is reduced. Dissonance reduction can occur by modifying either the cognition or the behavior so the two are more consistent.

Relationship amplification hypothesis

I propose that this desire for consistency accounts for at least part of relationship satisfaction in long distance relationships. Members of long distance relationships endure disadvantages that affect their emotions, finances, social lives, and the amount and quality of

time spent with their partners. A great deal of commitment, sacrifice, and money is required to maintain a long distance relationship. The costs are high. It would not be consistent for one to sustain these high costs for a mediocre relationship. Indeed, it would not even be consistent for a person to sustain these costs for a good relationship. The only type of relationship that would justify enduring the various difficulties of a long distance relationship would be a highly satisfying one, in which each partner had extremely positive feelings about his or her partner, the status of the relationship, and its prospects for the future. According to this logic, if members of long distance relationships did not consider their relationships to be satisfying, it would create cognitive dissonance for them to undergo the considerable costs required to maintain them. Therefore, they modify their perceptions of their relationships, so that their evaluations of their relationships are consistent with their behavior in maintaining them. In this theoretical framework, people in long distance relationships may acknowledge that there are many disadvantages in their relationships, but believe that enduring the disadvantages is worth it because the relationships are highly satisfying.

The Aronson & Mills experiment (1959) is a classic illustration of cognitive dissonance (Harmon-Jones and Mills, 1999). In this experiment, college-aged women were made to undergo an initiation process in order to join a discussion group. Half of the women underwent a mild initiation process, while rest of the women underwent an embarrassing and difficult initiation process (they were made to read sexually explicit words and phrases aloud to a room full of people). The discussion group the women later joined was intentionally uninteresting, but the women who had experienced the difficult initiation rated the group as being much more interesting than the women in the mild initiation condition. The women in the difficult initiation condition justified the humiliation they suffered to obtain access to the

group by evaluating the group as being more interesting, and therefore worth the unpleasantness they endured.

The phenomenon of cognitive dissonance has been found in many different contexts. Gerard and Mathewson (1966) replicated the results of Aronson & Mills. In their study, participants who endured electric shocks to gain entry into a group rated the group more highly than participants who did not endure the electric shocks. Axsom and Cooper (1985) found that subjects who often performed tedious, cognitive tasks in a weight loss program lost more weight, and kept the weight off longer, than both subjects who underwent fewer cognitive tasks and subjects in a no-effort control group. The tedious cognitive tasks were completely unrelated to conventional weight loss methods. Similarly, Cooper (1980) found that subjects who experienced either emotionally intense therapy or physical exertion in attempting to overcome their phobia of snakes could later approach a snake more closely than subjects in lower effort conditions. In all of these studies, engaging in effort to pursue a goal would have created dissonance had the goal not been reached. Not achieving the goal meant there was insufficient justification for putting forth the effort. Therefore, people who endured more work tried harder to be successful, and when they were successful, their dissonance was reduced, and they were more likely to see their effort as justified. Cognitive dissonance has even been suggested as a reason why the United States continued its involvement in the Vietnam War (Milburn & Christie, 1990).

It may seem absurd to compare the experience of being in a long distance relationship to the Vietnam War, but I propose that similar processes could link the two phenomena. In both instances, the effort, work, and suffering incurred may not have always seemed worth the outcome. To have invested effort and work into an outcome that ultimately was not

worth it could lead to the unpleasant mental arousal of cognitive dissonance. However, dissonance is easily avoided by simply revising one's notions of the outcome. Specifically, inflating an outcome, whether it be progress in the Vietnam War or the state of a romantic relationship, such that one determines it *has* been worth the effort and sacrifice prevents the uncomfortable experience of having one's behavior and cognitions at odds with each other.

Cost minimization hypothesis

Amplifying the perceived rewards received from partners is not the only way people in long distance relationships can minimize cognitive dissonance. Another way is to downplay the costs. Perhaps people in long distance relationships would feel an unpleasant sense of arousal if they fully recognized how much effort and sacrifice their relationships entail. However, to avoid the unpleasant arousal, they may never fully acknowledge the costs and disadvantages of their relationships. If they consider the disadvantages to be minor, they prevent dissonance from occurring. Participants' subjective assessments of the costs in their relationship may not be congruent with a more objective assessment of these costs, or with how people who are not in long distance relationships would evaluate them.

The classic Festinger & Carlsmith (1959) forced compliance study provides an example of minimizing the negative aspects of a situation. Participants in that study were forced to endure a very long and boring experiment. Afterwards, they were asked to tell a prospective participant in the same experiment that it had actually been enjoyable, and they were offered either one dollar or twenty dollars as payment for doing so. Participants who had been paid twenty dollars to lie did not experience cognitive dissonance because the high level of compensation justified their lie. Being asked to tell a lie for only one dollar, on the other hand, created cognitive dissonance in those participants. They reduced the negative

arousal created by the cognitive dissonance by rating the boring experiment as having been enjoyable. By downplaying the negative aspects of the study, these participants were able to feel better about the fact that they had lied to another student.

Another classic dissonance study by Zimbardo, Weisenberg, Firestone, & Levy (1965) provides an example of minimizing the negative aspects of a situation. Participants were members of an army reserve unit who were told the study was about survival foods. Participants were asked to eat fried grasshoppers by one of two officers: a kind, personable officer or a cold, unlikable officer. Both before and after eating the grasshoppers, participants indicated their attitude towards having to eat them. Participants who were asked to eat the grasshoppers by the mean officer had attitudes about eating grasshoppers that became more favorable than participants who were asked to eat the grasshoppers by the nice officer. It would create dissonance to do something distasteful at the request of a mean person, but to minimize the distastefulness of the act minimizes dissonance by reducing the discrepancy between attitude and behavior.

A fair amount of research has been conducted on cognitive dissonance in cigarette smokers. Engaging in such a dangerous behavior should create cognitive dissonance and motivate smokers to minimize the dangers of smoking. A study of smokers in a cessation program found that participants with high self-esteem who were not successful at quitting smoking decreased their perceptions of the risks of smoking, ostensibly to minimize their cognitive dissonance (Gibbons, Eggleston, & Benthin, 1997). Low self-esteem smokers, on the other hand, did not experience arousal from failing to quit a behavior that was dangerous. Other researchers have found that current smokers were more likely than former smokers (Halpern, 1994) and non-smokers (McMaster & Lee, 1991) to endorse statements that

minimize smoking risks. For example, smokers were more likely than both non-smokers and former smokers to endorse the statement “The link between smoking and chronic bronchitis has not been fully established” (McMaster & Lee, 1991). When faced with the dissonance created by engaging in a life-threatening behavior, smokers minimize their dissonance by distorting their cognitions regarding the behavior.

I propose that individuals in long distance relationships could experience a similar dissonance minimization process. Over time, being in a long distance relationship should involve certain disadvantages and drawbacks. To fully acknowledge the difficulties their relationships entail would lead to some cognitive discomfort, just as fully acknowledging the dangers of cigarettes would cause smokers cognitive discomfort. Minimizing one’s perceptions of the unpleasant aspects of being in a long distance relationships may prevent those involved in such relationships from experience of this discomfort.

The Current Studies

Study One

Study one tested the cost minimization hypothesis. The cost minimization hypothesis predicts that people in long distance relationships cognitively minimize the costs inherent in their relationships in order to keep their notions of the behaviors necessary to maintain their relationships consistent with their evaluations of the relationships themselves. To measure the cost minimization hypothesis, people whose relationship was beginning a long distance phase (and a group of people in geographically proximal relationships, for comparison purposes) participated at two time waves—shortly after their relationship had become a long distance relationship, and approximately four months later. If cost minimization plays a role in how people cope with long distance relationships, its influence probably starts early in the

separation process. Therefore, examining relationships of individuals who have just separated from their partners is preferable to examining relationships of individuals who are more accustomed to being separated.

Participants answered questions about both the subjective and objective costs in their relationships. In the case of objective costs, participants tried to estimate specifically how frequently they experienced a cost in a given time period. In the case of subjective costs, participants rated, in a more general sense, how frequently they experienced a cost on a Likert-type scale. The cost minimization hypothesis will be supported if participants in long distance relationships assessed the costs in their relationships differently than participants in geographically proximal relationships over time. From time 1 to time 2, it is hypothesized that participants in long distance relationships, but not geographically proximal relationships, will indicate that the objective costs in their relationships have increased (hypothesis one). For example, as they spend more time in a long distance relationship, they spend more dollars on their relationships per month, they think about how much they miss their partners more times per day, etc. However, from time 1 to time 2, it is hypothesized that neither participants in long distance relationships nor participants in geographically proximal relationships will indicate that the subjective costs in their relationship have increased (hypothesis two). For instance, as the number of dollars people in long distance relationships spend on their relationship increases (objective costs), their perceptions of how much they spend on their relationship will not change (subjective costs). As the number of times a day people in long distance relationships feel sad because they miss their partner increases (objective costs), their perceptions of how frequently they feel sad because they miss their partner does not change (subjective costs). If both hypothesis one and two were supported,

such a result would indicate that people in long distance relationships minimize their assessments of the costs in their relationships, separating their objective notions of costs from their subjective notions of costs.

The cost minimization hypothesis will also be supported if participants with higher subjective costs at time 2 had lower relationship satisfaction at time 2 (hypothesis three). People who keep their assessments of the subjective costs in their relationships low, despite rising objective costs in their relationships, should be able to remain satisfied in their relationships. People whose assessments of both the subjective and objective costs in their relationship rise have not cognitively minimized the efforts and hassles of being in a long distance relationship, and therefore should be less satisfied with their relationships.

Study Two

Study two tested the relationship amplification hypothesis in the laboratory. The relationship amplification hypothesis predicts that participants inflate their sense of satisfaction with their relationships in order to keep their evaluations of their relationships consistent with the behaviors that are necessary to maintain them. Participants read a highly credible news story that either said that long distance relationships are more satisfying and fulfilling than geographically proximal relationships, or that geographically proximal relationships are more satisfying and fulfilling than long distance relationships. Participants' arousal and relationship satisfaction were measured. Both those in long distance and geographically proximal relationships should experience arousal when reading a story suggesting that their relationship is not the optimal type of relationship (hypothesis four). However, long distance relationships differ from geographically proximal relationships in that long distance relationships require additional effort, and this effort must be accounted for

when predicting relationship satisfaction. If members of long distance relationships amplify their feelings of satisfaction with their relationships in order to cognitively balance the effort their relationships require, then they should react differently to reading a media story denouncing their type of relationship than members of geographically proximal relationships will. Specifically, people in long distance relationships who read a media story suggesting that their relationship is not the optimal type should show an increase in their relationship satisfaction, whereas people in geographically proximal relationships should not (hypothesis five).

STUDY ONE METHOD

Participants

Participants were Iowa State University students who were recruited using mass testing, a procedure in which students enrolled in any of three introductory-level psychology classes are offered the opportunity to answer questions in exchange for extra credit. Researchers in the Psychology Department then use the participants' answers to these questions to recruit participants with particular characteristics for subsequent studies. The current study asked participants some general questions about their romantic relationships, including how frequently they see their current partner and whether or not they consider themselves to be in a long distance relationship.

The current study included 256 students, 164 females and 92 males, who completed the survey at time 1 (mid-to late September, 2004). Of these participants, 125 were in a long distance relationship, and 131 were in a geographically proximal relationship. Participants were classified as being in a long distance relationship if they answered yes to either of the following questions: "I consider myself to be in a long distance relationship" or "I live far enough away from my partner that it would be impossible for us to see each other every day." The mean age for females was 18.95 years, whereas the mean age for males was 19.58 years. This sample was 90.7 % Caucasian, 2.0 % Asian American, 1.6 % African American, 2.0 % Hispanic, and 3.2% multiracial or other minority. The members of long distance relationships indicated that they had all been in their long distance relationship for a short period of time, approximately a month or less. It was necessary to ensure that the members of long distance couples were in a period of adjustment to the demands of their long distance relationship in order to test the cost minimization hypotheses. The relationships between

subjective costs, objective costs, and relationship satisfaction are probably more stable in established long distance couples, but are in flux at the start of a long distance relationship. Therefore, all of the participants in this stage of data collection were relatively new to long distance relationships.

At the time 2 data collection (early to mid-December, 2004), 58 students were lost to attrition (34 females and 24 males), leaving a total of 198 students, 130 females and 68 males. Of these participants, a total of 26 (17 long distance and 8 geographically proximal) indicated that their relationships had ended since their time 1 participation, leaving 172 members of intact relationships, 74 of whom were in a long distance relationship and 98 were in a geographically proximal relationship. Participants who were lost to attrition were not significantly different than participants who completed time 2 data collection on age or relationship satisfaction at time 1. However, people who responded at time 2 had been in their relationships longer than people who did not respond at time 2 (M for responders = 3.24 years, M for non-responders = 2.93 years, $t(250) = 2.22, p < .03$). In addition, time 1 participants who responded at time 2 had relationships that were lower in subjective costs ($M = 31.24, SD = 10.03$) than time 1 participants who were lost to attrition ($M = 35.47, SD = 21.50, t(236) = 2.03, p < .05$).

Materials

Participants completed an online questionnaire that included some demographic questions as well as questions about their relationship satisfaction and the objective and subjective costs in their relationships. Relationship satisfaction was measured with Hendrick's (1988) seven-item Relationship Assessment Scale, which has been shown to be

internally consistent ($\alpha = 0.86$, Hendrick, 1988). A sample item from the Relationship Assessment Scale is “In general, I am satisfied with my relationship.”

Objective costs were measured with a 13-item scale, asking participants to estimate specifically the frequency of costs they experienced in their relationship in a specified time period. An example of an item measuring objective costs is “Please estimate how many times a week you feel sad because you miss your romantic partner.” For the objective costs scale, the items were open-ended, and participants provided a specific numerical answer. Subjective costs were measured with a 13-item scale. An example of an item measuring subjective costs is “I feel sad because I miss my romantic partner.” For the subjective costs scale, participants used a five-item Likert-type response scale that ranged from “strongly disagree” to “strongly agree.” The entire online questionnaire has been attached as Appendix A.

Procedure

Participants who met the inclusion criteria received a letter inviting them to participate in the study. A copy of this recruitment letter has been attached as Appendix B. In the letter, participants were invited to log onto the website www.psychdata.com and complete the survey online. Participants were told that when they completed the survey, a member of the research team would submit an extra credit card on their behalf, and they would receive a confirmation email to inform them that their extra credit had been submitted. Participants were also told in the letter that, if they indicated they were interested, they would be invited to complete the survey again at the end of the semester and that, if they completed the survey at time 2, they would earn another extra credit point.

STUDY ONE RESULTS

Study one tracked participants' assessments of objective and subjective costs in long distance relationships over time. It was hypothesized that the objective costs would increase from time 1 to time 2 (hypothesis one) in long distance relationships but not in geographically proximal relationships. Subjective costs, on the other hand, were not expected to increase from time 1 to time 2 in either type of relationship (hypothesis two). To test these hypotheses, a series of repeated-measures ANOVAs was conducted. It was expected that a significant interaction between relationship type (long distance and geographically proximal) and time (time 1 = September and time 2 = December) would be found for objective costs, but not subjective costs.

Finally, it was hypothesized that an increase in subjective costs from time 1 to time 2 would be inversely related to relationship satisfaction for participants in both types of relationships (hypothesis three). To test this hypothesis, a multiple regression analysis was conducted. In step 1 one of the equation, time 2 relationship satisfaction was regressed on time 1 relationship satisfaction, relationship type, time 1 costs, and time 2 costs. In step 2, the interaction between time 2 costs and relationship type was added to the model. This interaction term was expected to be a statistically significant predictor of time 2 relationship satisfaction, controlling for the step 1 variables.

Costs Subscales

The thirteen items that measured costs in relationships were combined into five different costs subscales based on face validity: emotional costs, financial costs, attachment costs, social costs, and trust costs. Exploratory factor analyses largely confirmed the subscale structure, although some social and emotional cost items loaded on both the social

and emotional cost factors above .30. The items that were combined to form each subscale can be found in Table 2, and the coefficient alpha for each subscale formed can be found in Table 3. The subjective and objective attachment cost subscale items were phrased such that a higher score indicated a lower level of attachment costs. This pattern is the opposite of the rest of the items. In the case of the subjective attachment costs subscale, the items were simply reverse coded. In the case of the objective attachment costs subscale, the items were not reversed; a higher score indicates a lower level of objective attachment costs.

In addition to the five subscales, overall objective and subjective costs scores were computed, using the formula for computing the reliability of a linear composite. For the overall objective costs score, each variable was first standardized. Next, the attachment items were subtracted from, rather than added, to other objective cost items in the overall objective cost index. When creating the overall subjective costs score, the attachment costs items were reverse coded before being combined with the other items.

Table 2: Objective and Subjective Costs Subscales

	Subjective Costs	Objective Costs
Emotional Costs	Please estimate how many times a week you feel sad because you miss your romantic partner.	I feel sad because I miss my romantic partner.
	Please estimate how many times a week you feel lonely without your partner.	I feel lonely when my partner isn't with me.
	Please estimate how many times a month you are with your partner and begin to dread the next time you'll be apart.	When I'm with my partner, I begin to dread the next time we'll be apart.
Financial Costs	Please estimate how much money you spend on your relationship in a typical month (include money spent on phone bills, travel costs, gifts, meals you pay for, activities you do together that cost money, etc.).	I spend a lot of money on my relationship each month.

Attachment Costs	Please estimate how many times a month you are talk (or write or send an email) to your partner and feel better afterwards.	I talk (or write or email) my partner about my problems and feel better afterwards (rev).
	Please estimate how many times a week you and your partner exchange information about the minor or unimportant details in your lives.	My partner and I exchange information about the minor or unimportant details in our lives (rev).
	Please estimate how many times a month you and your partner engage in leisure activities.	My partner and I engage in leisure activities together (rev).
	Please estimate how many times a month you and your partner engage in sexual intimacies.	My partner and I engage in sexual intimacies (rev).
Social Costs	Please estimate how many times a month you miss a fun time with your friends because you are spending time with your romantic partner.	I miss fun times with my friends because I'm spending time with my romantic partner.
	Please estimate how many times a month you miss time with your family because you are spending time with your romantic partner.	I miss time with my family because I'm spending time with my romantic partner.
	Please estimate how many times a month you feel awkward attending a social event without your partner.	I feel awkward attending social events without my partner.
Trust Costs	Please estimate how many times a month you worry about your partner cheating on you.	I worry that my partner is cheating on me.
	Please estimate how many times a month your partner mentions being worried that you will cheat on him or her.	My partner worries that I will cheat on him or her.

Table 3: Coefficient alphas for the subscales

	Objective Costs						Subjective Costs					
	Long Distance*		Non-Long Distance*		All*		Long Distance		Non-Long Distance		All	
	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
Emotional	.71	.78	.69	.73	.74	.74	.72	.69	.51	.66	.71	.72
Attachment	.47	.60	.76	.56	.70	.62	.63	.71	.47	.59	.56	.62
Social	.65	.63	.53	.33	.64	.44	.64	.30	.31	.29	.39	.37
Trust	.33	.32	.78	.33	.33	.34	.48	.40	.64	.56	.70	.45
Overall	.75	.57	.72	.61	.76	.62	.60	.52	.60	.67	.64	.63

*Standardized alpha

Tests of Hypotheses

Change in objective costs. For each of the five objective costs, it was predicted that the interaction between relationship type and time would be statistically significant. In other words, I predicted that people in long distance relationships and geographically proximal relationships would experience different changes in objective costs over the course of the semester. Specifically, I predicted that objective costs should be higher at time 2 than at time 1, but only for members of long distance relationships. To test that hypothesis, repeated measures analysis of variance (ANOVA) tests were conducted. Relationship type (long distance relationship or geographically proximal relationship) was tested as a between-subjects variable, and time was tested as a within-subjects variable.

First looking at emotional costs, there was a significant main effect for relationship type ($F(1, 164) = 12.50, p < .01$) and a marginally significant main effect for time ($F(1, 164) = 2.80, p = .10$). Participants in long distance relationships had higher emotional costs ($M = 12.74$) than participants in geographically proximal relationships ($M = 7.24$), and participants had higher emotional costs at time 1 ($M = 10.54$) than at time 2 ($M = 9.44$). The interaction between relationship type and time was not statistically significant ($F(1, 164) = 1.23, p = .27$).

Turning next to financial costs, there were no significant main effects for relationship type ($F(1, 164) = 2.23, p = .14$) or time ($F(1, 164) = 0.51, p = .48$). There was, however, a significant relationship type by time interaction ($F(1, 164) = 3.98, p < .05$). Financial costs decreased from time 1 to time 2 for members of long distance relationships ($M(\text{time 1}) = 96.23, M(\text{time 2}) = 86.01$), and decreased even more from time 1 to time 2 for members of geographically proximal relationships ($M(\text{time 1}) = 128.66, M(\text{time 2}) = 89.79$).

In the case of attachment costs, there was a statistically significant main effect for relationship type ($F(1, 148) = 5.10, p < .05$). Participants in geographically proximal relationships had higher attachment benefits (and thus, lower attachment costs ($M = 57.73$)) than participants in LDR's ($M = 44.43$). (The way the objective attachment cost items were phrased, a higher number of benefits indicates a lower level of objective attachment costs). There was not a statistically significant main effect for time ($F(1, 148) = 0.56, p = .46$), and the interaction between relationship type and time was not significant ($F(1, 148) = 1.27, p = .26$).

Turning next to social costs, there was not a statistically significant main effect for relationship type ($F(1, 162) = 0.06, p = .81$) or for time ($F(1, 162) = 0.10, p = .75$). In addition, the interaction between relationship type and time was not statistically significant ($F(1, 162) = 1.64, p = .20$).

Finally, in the case of trust costs, there was a marginally statistically significant main effect for time ($F(1, 165) = 3.37, p = .07$). Participants had higher trust costs at time 1 ($M = 2.90$) than at time 2 ($M = 2.07$). There was no significant main effect for relationship type ($F(1, 165) = 1.43, p = .23$), and the interaction between relationship type and time was also not significant ($F(1, 165) = 0.02, p = .90$).

One more repeated measures ANOVA was conducted, comparing overall objective costs (emotional, financial, attachment, social, and trust costs summed together into one index) as a function of both relationship type and time. For overall costs, there was a marginally significant main effect for time ($F(1, 139) = 3.45, p = .07$). Participants had higher overall objective costs at time 1 than at time 2. There was a significant main effect for relationship type ($F(1, 139) = 12.35, p = .001$). Participants in long distance relationships

had higher overall objective costs than participants in geographically proximal relationships. The interaction between relationship type and time was not significant ($F(1, 139) = 0.01, p = .92$).

Overall, these results provide minimal support for hypothesis one, which predicted that objective costs would rise from time 1 to time 2 only for members of long distance relationships. This pattern was found only for financial costs; members of long distance relationships said the objective financial costs in their relationships increased from time 1 to time 2, whereas members of geographically proximal relationships said the objective financial costs in their relationships decreased from time 1 to time 2. For the other four types of costs and the overall objective costs index, however, hypothesis two was not supported. Contrary to prediction, those in long distance relationships did not experience a greater increase in objective emotional, attachment, social, or trust costs from time 1 to time 2. It should be noted, however, that across time points members of long distance relationships had higher emotional costs, attachment costs, and overall objective costs than members of geographically proximal relationships.

Change in subjective costs. For the five subjective costs, it was predicted that people in long distance relationships and geographically proximal relationships would experience different patterns of change in their assessments of the subjective costs in their relationships. To test that hypothesis, several repeated measures analysis of variance (ANOVA) tests were conducted. Relationship type (long distance or geographically proximal) was tested as a between-subjects variable, and time was tested as a within-subjects variable.

For subjective emotional costs, there was a significant main effect for relationship type ($F(1, 170) = 51.36, p < .01$). Participants in long distance relationships had higher

subjective emotional costs ($M = 7.37$) than participants in geographically proximal relationships ($M = 5.88$). However, neither the main effect for time ($F(1, 170) = 0.83, p = .36$) nor the interaction between relationship type and time ($F(1, 170) = 1.01, p = .32$) was significant.

In the case of subjective financial costs, the main effect for relationship type ($F(1, 170) = 4.35, p < .05$) was significant, and the main effect for time ($F(1, 170) = 3.72, p = .06$) was marginally significant. Participants in geographically proximal relationships had higher subjective financial costs ($M = 2.69$) than participants in long distance relationships ($M = 2.43$), and participants had higher financial costs at time 2 ($M = 2.63$) than at time 1 ($M = 2.49$). The interaction between relationship type and time was not significant ($F(1, 170) = 1.82, p = .18$).

Turning next to subjective attachment costs, there was no significant main effect for relationship type ($F(1, 162) = 0.79, p = .38$) or time ($F(1, 162) = 0.34, p = .56$). The interaction between relationship type and time was not significant ($F(1, 162) = 1.21, p = .27$).

For subjective social costs, there was a significant main effect for time ($F(1, 167) = 4.91, p < .05$). Participants had lower social costs at time 1 ($M = 4.77$) than at time 2 ($M = 4.97$). Neither the main effect for relationship type ($F(1, 167) = 0.04, p = .85$) nor the interaction between relationship type and time ($F(1, 167) = 2.55, p = .11$) was significant.

Finally, in the case of trust costs, there was a marginally significant main effect for relationship type ($F(1, 167) = 3.54, p = .06$). Participants in long distance relationships had higher trust costs ($M = 2.77$) than participants in geographically proximal relationships ($M = 2.53$). However, neither the main effect for time ($F(1, 167) = 0.11, p = .75$) nor the interaction between relationship type and time ($F(1, 167) = 1.90, p = .17$) was significant.

One more repeated measures ANOVA was conducted, this one comparing overall subjective costs (emotional, financial, attachment, social, and trust costs summed together into one index) as a function of both relationship type and time. There were significant main effects for both relationship type ($F(1, 154) = 17.32, p < .01$) and time ($F(1, 154) = 23.01, p < .01$). Participants in long distance relationships had higher subjective costs ($M = 31.56$) than participants in geographically proximal relationships ($M = 27.91$), and participants had higher subjective costs at time 1 ($M = 31.40$) than at time 2 ($M = 28.06$). Finally, the interaction between relationship type and time was also statistically significant ($F(1, 154) = 7.77, p < .01$). Subjective costs decreased more from time 1 to time 2 for members of long distance relationships than for members of geographically proximal relationships.

Overall, the results for subjective costs provided mixed support for the hypotheses. Members of long distance relationships had higher subjective emotional costs, trust costs, and overall subjective costs than members of geographically proximal relationships. Members of geographically proximal relationships, on the other hand, had higher financial costs than members of long distance relationships. From time 1 to time 2, none of the five types of subjective costs changed differently for people in long distance relationships and geographically proximal relationships. However, for the overall subjective index, subjective costs did change differently as a function of relationship type. Specifically, people in long distance relationships had greater subjective cost decline than people in geographically proximal relationships.

In summary, it appears that members of long distance relationships do not experience a rise in the objective costs of their relationships over time. Members of long distance relationships had higher subjective and objective costs, overall, than members of

geographically proximal relationships. Their subjective costs decreased significantly more over time than those of geographically proximal relationships. Their objective costs, however, decreased at the same rate as those in the geographically proximal group.

Knowing what we do about how objective and subjective costs changed over time for members of long distance and geographically proximal relationships, it seems desirable to examine how relationship satisfaction changed over time as a function of relationship type. I conducted a repeated measures analysis of variance (ANOVA). Relationship type was tested (long distance or geographically proximal) was tested as a between-subjects variable, and time was tested as a within subjects variable. For relationship satisfaction, there was a marginally significant main effect of time ($F(1, 170) = 3.22, p = .08$). Participants had lower levels of relationship satisfaction at time 1 ($M = 3.97$) than at time 2 ($M = 4.06$). However, neither the main effect for relationship type ($F(1, 170) = 0.02, p = .88$) nor the interaction between relationship type and time ($F(1, 170) = 0.20, p = .66$) was significant.

To examine more closely the relationship between objective and subjective costs, I next examined the correlations between subjective and objective costs at each time point, separately for each relationship type. Table 4 provides these correlations.

Table 4: Correlations between subjective and objective costs

	Long Distance Participants		Geographically Proximal Participants	
	T1	T2	T1	T2
Emotional	.41* (n = 122)	.52* (n = 71)	.49* (n = 126)	.45* (n = 98)
Financial	.50* (n = 123)	.37* (n = 73)	.14 (n = 127)	.04 (n = 95)
Attachment	.22* (n = 109)	.28* (n = 67)	.08 (n = 118)	.36* (n = 89)
Social	.32* (n = 117)	.64* (n = 70)	.41* (n = 131)	.58* (n = 96)
Trust	.44* (n = 120)	.71* (n = 71)	.74* (n = 127)	.73* (n = 96)
Overall	.58* (n = 102)	.48* (n = 65)	.45* (n = 92)	.47* (n = 85)

According to hypotheses one and two, people in long distance relationships have objective costs that increase over time, and they do not acknowledge this increase in objective costs by increasing their assessments of the subjective costs in their relationships correspondingly. If this phenomenon occurred, we would expect the correlation between subjective and objective costs to be lower at time 2 than at time 1 for members of long distance relationships. Only the correlations for financial costs and overall costs reflect this pattern, although tests performed to gauge whether the time 1 correlations were significantly higher than the time 2 correlations were not significant in either case (for financial costs, $z = 1.07, p = .28$; for overall costs, $z = 0.86, p = .39$). For emotional, attachment, social, and trust costs, the correlations for long distance relationships are higher, not lower, at time 2 when compared to time 1.

Predicting satisfaction. First, a general examination of the pattern of correlations among subjective costs, objective costs, and relationship satisfaction seems appropriate.

Table 5 contains the correlations between objective costs and satisfaction for the two types of

relationships; table 6 contains the correlations for subjective costs and satisfaction. For both tables, the correlations for long distance relationships are below the diagonal; correlations for geographically proximal relationships are above the diagonal.

Table 5: Correlations between objective costs and relationship satisfaction

	1	2	3	4	5	6	7
1. Emotional costs	--	.21*	.26*	.38*	.30*	.36*	.01
2. Financial costs	.09	--	.25*	.02	-.04	.21*	.08
3. Attachment costs	.21*	.23*	--	-.02	.28*	-.71*	.16
4. Social costs	.21*	.19*	.13	--	.26*	.43*	-.09
5. Trust costs	.13	.16	-.02	.88*	--	.05	-.18*
6. Total objective costs	.55*	.20*	-.07	.88*	.82*	--	-.16
7. Relationship satisfaction	.02	.02	-.13	-.26*	-.21*	-.18*	--

n = 115 long distance relationships, 125 geographically proximal relationships

The pattern in the relationship between objective costs and relationship satisfaction was similar for the two relationship types. Trust costs were inversely related to relationship satisfaction for members of both long distance relationships and geographically proximal relationships. The negative correlation between social costs and overall objective costs, however, was only statistically significant for members of long distance relationships.

Table 6: Correlations between subjective costs and relationship satisfaction

	1	2	3	4	5	6	7
1. Emotional costs	--	.09	-.09	.24*	.10	.49*	.17
2. Financial costs	.17	--	.09	.01	.02	.11	-.08
3. Attachment costs	-.43*	-.25*	--	-.08	.02	.13	-.35*
4. Social costs	.20*	.23*	-.21*	--	.13	.25*	-.04
5. Trust costs	.26*	.25*	-.13	.34*	--	.30*	-.17*
6. Total subjective costs	.39*	.09	-.17	.20*	.32*	--	-.12
7. Relationship satisfaction	.17	.19	-.30*	-.07	-.32*	-.15	--

n = 115 for long distance relationships, 125 for geographically proximal relationships

Overall, the patterns of correlations between subjective costs and relationship satisfaction look similar between the two types of relationships. Specifically, attachment and trust costs are negatively and significantly correlated with relationship satisfaction for both types of relationships. Interestingly, attachment costs are significantly negatively correlated with emotional, financial, and social costs for members of long distance relationships; none of these correlations are significant for members of geographically proximal relationships.

Finally, a series of multiple regression analyses was conducted. In these analyses, changes in subjective costs and objective costs were tested as predictors of changes in relationship satisfaction. In step 1, relationship satisfaction at time 1, a dummy coded variable for relationship type (0 = geographically proximal relationship, 1 = long distance relationship), time 1 cost, and time 2 cost were entered into the model. Because time 1 cost is entered before time 2 cost, the time 2 cost variable represents change in the cost. In step 2, the interaction term for the time 2 cost variable by relationship type was added, controlling for all of the step 1 variables. This interaction term represents the interaction between change in the cost and relationship type.

Table 7: Change in emotional costs predicting change in relationship satisfaction

		Obj. Emotional Costs				Subj. Emotional Costs			
		<i>B</i>	β	<i>t</i>	<i>p</i>	<i>B</i>	β	<i>t</i>	<i>p</i>
Step 1	Time 1 relationship satisfaction	.30	.30	3.97	.001	.33	.33	4.38	.001
	Relationship type	.04	.03	0.44	.66	.09	.09	1.08	.28
	Time 1 emotional costs	-.02	-.08	-0.73	.47	-.05	-.15	-1.47	.15
	Time 2 emotional costs	.01	.03	0.26	.80	.01	.03	0.30	.77
Step 2	Time 1 relationship satisfaction	.30	.30	3.95	.001	.31	.32	4.15	.001
	Relationship type	.04	.03	0.43	.67	.42	.41	1.23	.22
	Time 1 emotional costs	-.02	-.08	-0.74	.46	-.04	-.14	-1.35	.18
	Time 2 emotional costs	.01	.02	0.16	.87	.04	.13	0.90	.37
	Time 2 emotional costs x relationship type	.01	.01	0.10	.92	-.05	-.38	-0.99	.32

Note: For the objective model, $R^2 = 9.4\%$ for Step 1; $\Delta R^2 = 0.0\%$ for Step 2.
 For the subjective model, $R^2 = 10.9\%$ for Step 1, $\Delta R^2 = 0.6\%$ for Step 2.

The hypothesis was not supported for objective or subjective emotional costs.

Change in neither objective nor subjective emotional costs significantly predicted change in relationship satisfaction, nor did change in emotional costs predict change in relationship satisfaction differently as a function of relationship type.

Table 8: Change in financial costs predicting change in relationship satisfaction

	Obj. Financial Costs				Subj. Financial Costs			
	<i>B</i>	β	<i>t</i>	<i>p</i>	<i>B</i>	β	<i>t</i>	<i>p</i>
Step 1								
Time 1 relationship satisfaction	.30	.31	4.11	.001	.31	.31	4.17	.001
Relationship type	.03	.03	0.33	.74	.02	.02	0.24	.81
Time 1 financial costs	.05	.11	1.29	.20	-.05	-.09	-0.97	.33
Time 2 financial costs	-.04	-.07	-0.80	.43	.01	.02	0.23	.82
Step 2								
Time 1 relationship satisfaction	.30	.31	4.13	.001	.31	.31	4.15	.001
Relationship type	.02	.02	0.31	.76	.02	.02	0.08	.94
Time 1 financial costs	.05	.11	1.18	.24	-.05	-.09	-0.97	.33
Time 2 financial costs	-.02	-.05	-0.45	.65	.01	.02	0.18	.86
Time 2 financial costs x relationship type	-.05	-.05	-0.52	.60	.000	.001	0.01	.99

Note: For the objective model, $R^2 = 10.6\%$ for Step 1; $\Delta R^2 = 0.1\%$ for Step 2.

For the subjective model, $R^2 = 10.1\%$ for Step 1, $\Delta R^2 = 0.0\%$ for Step 2.

The hypothesis was not supported for objective or subjective financial costs. Change in neither type of financial costs significantly predicted change in relationship satisfaction, nor did change in financial costs predict change in relationship satisfaction differently as a function of relationship type.

Table 9: Change in attachment costs predicting change in relationship satisfaction

	Obj. Attachment Costs				Subj. Attachment Costs			
	B	β	t	p	B	β	t	p
Step 1								
Time 1 relationship satisfaction	.26	.27	3.55	.001	.21	.21	2.78	.01
Relationship type	.05	.05	0.57	.57	.06	.05	0.75	.45
Time 1 attachment costs	.02	.12	1.43	.15	-.03	-.10	-1.05	.29
Time 2 attachment costs	.04	.20	2.46	.05	-.06	-.27	-2.86	.01
Step 2								
Time 1 relationship satisfaction	.26	.27	3.52	.001	.19	.19	2.56	.05
Relationship type	.05	.04	0.56	.57	-.93	-.90	-2.46	.05
Time 1 attachment costs	.02	.12	1.44	.15	-.03	-.13	-1.40	.16
Time 2 attachment costs	.04	.21	1.96	.052	-.10	-.43	-3.89	.001
Time 2 attachment costs x relationship type	-.01	-.02	-0.15	.88	.09	.99	2.66	.01

Note: For the objective model, $R^2 = 16.2\%$ for Step 1; $\Delta R^2 = 0.0\%$ for Step 2.
For the subjective model, $R^2 = 20.1\%$ for Step 1, $\Delta R^2 = 3.4\%$ for Step 2.

The results for attachment costs were intriguing. In the case of objective costs, change in attachment costs predicted change in relationship satisfaction, such that participants whose objective attachment costs decreased from time 1 to time 2 (put another way, those whose objective attachment benefits increased) experienced an increase in relationship satisfaction from time 1 to time 2. However, change in objective attachment costs did not predict change in relationship satisfaction differently as a function of relationship type.

Turning next to subjective costs, change in attachment costs predicted change in relationship satisfaction, such that participants whose subjective attachment costs increased from time 1 to time 2 experienced a decrease in relationship satisfaction from time 1 to time 2. Interesting, this pattern *did* differ for long distance relationships and geographically

proximal relationships. Specifically, change in subjective costs had a larger effect on relationship satisfaction for people in long distance relationships than for people in geographically proximal relationships.

Table 10: Change in social costs predicting change in relationship satisfaction

		Obj. Social Costs				Subj. Social Costs			
		<i>B</i>	β	<i>t</i>	<i>p</i>	<i>B</i>	β	<i>t</i>	<i>p</i>
Step 1	Time 1 relationship satisfaction	.29	.29	3.81	.001	.34	.33	4.54	.001
	Relationship type	.02	.02	0.29	.78	.02	.02	0.30	.77
	Time 1 social costs	-.01	-.03	-0.33	.74	-.01	-.01	-0.04	.97
	Time 2 social costs	-.01	-.02	-0.18	.86	-.04	-.10	-1.17	.24
Step 2	Time 1 relationship satisfaction	.29	.30	3.88	.001	.34	.33	4.54	.001
	Relationship type	.02	.02	0.30	.76	-.47	-.45	-1.47	.15
	Time 1 social costs	-.02	-.05	-0.50	.62	-.01	-.02	-0.27	.79
	Time 2 social costs	-.02	-.08	-0.74	.46	-.08	-.20	-1.88	.06
	Time 2 social costs x relationship type	.04	.11	1.09	.28	.10	.50	1.58	.12

Note: For the objective model, $R^2 = 8.7\%$ for Step 1; $\Delta R^2 = 0.7\%$ for Step 2.
For the subjective model, $R^2 = 11.9\%$ for Step 1, $\Delta R^2 = 1.4\%$ for Step 2.

The hypothesis was not supported for objective social costs. Change in objective costs did not significantly predict change in relationship satisfaction, nor did it predict change in relationship satisfaction differently as a function of relationship type. However, the hypothesis was supported for subjective social costs. Specifically, participants whose subjective social costs increased from time 1 to time 2 experienced a decrease in relationship satisfaction. Change in social costs did not predict relationship satisfaction differently as a function of relationship type.

Table 11: Change in trust costs predicting change in relationship satisfaction

	Obj. Trust Costs				Subj. Trust Costs			
	<i>B</i>	β	<i>t</i>	<i>p</i>	<i>B</i>	β	<i>t</i>	<i>p</i>
Step 1								
Time 1 relationship satisfaction	.25	.26	3.42	.001	.26	.26	3.61	.001
Relationship type	.07	.07	0.90	.37	.06	.06	0.76	.45
Time 1 trust costs	-.09	-.08	-0.97	.33	.06	.11	1.00	.32
Time 2 trust costs	-.05	-.13	-1.54	.12	-.20	-.34	-3.07	.01
Step 2								
Time 1 relationship satisfaction	.25	.26	3.45	.001	.27	.27	3.68	.001
Relationship type	.07	.07	0.96	.34	-.24	-.23	-1.00	.32
Time 1 trust costs	-.09	-.08	-0.92	.36	.06	.11	1.00	.32
Time 2 trust costs	-.06	-.16	-1.77	.08	-.25	-.42	-3.32	.001
Time 2 trust costs x relationship type	.03	.08	1.08	.28	.11	.32	1.30	.20

Note: For the objective model, $R^2 = 11.1\%$ for Step 1; $\Delta R^2 = 0.7\%$ for Step 2.
 For the subjective model, $R^2 = 16.4\%$ for Step 1, $\Delta R^2 = 0.9\%$ for Step 2.

The hypothesis was supported for subjective trust costs. Change in subjective costs, but not objective costs, significantly predicted change in relationship satisfaction. More specifically, participants whose subjective trust costs increased from time 1 to time 2 experienced a decrease in relationship satisfaction from time 1 to time 2. Change in trust costs did not predict change in relationship satisfaction differently as a function of relationship type.

Table 12: Overall change in costs predicting change in relationship satisfaction

		Obj. Overall Costs				Subj. Overall Costs			
		<i>B</i>	β	<i>t</i>	<i>p</i>	<i>B</i>	β	<i>t</i>	<i>p</i>
Step 1	Time 1 relationship satisfaction	.31	.32	4.12	.001	.30	.29	3.97	.001
	Relationship type	.08	.08	0.92	.36	.11	.10	1.35	.18
	Time 1 overall costs	-.02	-.14	-1.63	.11	.01	.07	0.87	.38
	Time 2 overall costs	-.03	-.23	-2.68	.01	-.06	-.39	-4.89	.001
Step 2	Time 1 relationship satisfaction	.31	.33	4.13	.001	.30	.29	4.02	.001
	Relationship type	.08	.08	0.95	.35	-.56	-.53	-0.80	.43
	Time 1 overall costs	-.02	-.14	-1.55	.12	.01	.07	0.86	.39
	Time 2 overall costs	-.02	-.20	-1.96	.05	-.07	-.44	-4.60	.001
	Time 2 overall costs x relationship type	-.01	-.05	-0.50	.62	.02	.64	0.96	.34

Note: For the objective model, $R^2 = 17.9\%$ for Step 1; $\Delta R^2 = 0.2\%$ for Step 2.
 For the subjective model, $R^2 = 23.5\%$ for Step 1, $\Delta R^2 = 0.5\%$ for Step 2.

The hypothesis was supported for both objective and subjective overall costs.

Changes in either type of cost significantly predicted change in relationship satisfaction.

More specifically, participants whose objective or subjective trust costs increased from time 1 to time 2 experienced a decrease in relationship satisfaction from time 1 to time 2. Change in overall costs did not predict change in relationship satisfaction differently as a function of relationship type.

Overall, results of these multiple regression analyses provided mixed support for hypothesis three. In the case of objective and subjective attachment and trust costs, an increase in costs over time was related to a decrease in relationship satisfaction. This pattern

was also found for subjective social costs. In addition, change in overall objective and subjective costs was also related to a decrease in relationship satisfaction. In the case of subjective attachment costs, change over time had a larger impact on relationship satisfaction for members of long distance relationships than for members of geographically proximal relationships. Change in emotional and financial objective and subjective costs was not related to change in relationship satisfaction.

STUDY TWO METHOD

Participants

Participants were students at Iowa State University. A survey administered in mass testing identified participants who were involved in either geographically proximal or long-distance romantic relationships. Members of long distance relationships who were together for at least six months prior to separation, and members of geographically proximal relationships that have been together for at least six months, were recruited to come to the laboratory. Participants received an extra credit point as compensation for participating in the study. There were 148 participants in the study; 66 were members of long distance relationships and 88 were members of geographically proximal relationships. Fifteen participants had broken up with the partners between mass testing and the experiment, leaving 133 participants. Of these remaining 133 participants, 63 were members of long distance relationships and 70 were members of geographically proximal relationships. Participants were primarily Caucasian, with 1.3% of participants identifying as Asian, 3 % identifying as Latino-American, 0.8% identifying as African-American, 2.3% identifying as American Indian/Pacific Islander, and 0.8% identifying as multiracial.

Materials and Procedure

After coming to the lab and providing written informed consent, participants were asked to complete a Media Usage Questionnaire. This questionnaire asked participants to rate their average usage of various types of media, and to indicate the purpose of their media use (to get current news and information, for entertainment, etc.). The purpose of the Media Usage Questionnaire was to support the participant's impression that this experiment was

about media usage (as opposed to close relationships). The Media Usage Questionnaire has been attached in Appendix C.

After completing the Media Usage Questionnaire, participants were next told that they would be reading a story from a current media outlet. They then chose one of four marked envelopes that included a media story. Two of the envelopes contained a story called “Long distance relationships happy & satisfying”, and the other two envelopes contained a story called “Long distance relationships unhappy & unsatisfying.” Participants were led to believe that each envelope contained a unique news story, and the envelope they chose just happened to contain a story about long distance relationships. The media stories have been attached as Appendix D.

Next, participants completed a brief reaction time task that had been designed using MediaLab software. MediaLab measures reaction time in thousandths of a second. For fifteen trials, participants indicated if a group of letters that appeared on the screen formed a word, or did not form a word. Although typically reaction time tasks include many more trials than fifteen, it was important to make the reaction time task brief enough that participants would still feel any arousal, caused by dissonance (if they read a story that said their type of relationship was non-optimal). The reaction time task was designed to measure participants’ level of arousal. Aroused participants should respond more quickly on this easy task than participants who are not aroused. The words and non-words that participants responded to were presented in this order: wotuve, klebott, love, bowl, fulfill, junx, panko, running, sadness, cherry, acksif, end, melhn, ginap, and dinlu.

At this point, participants were led to believe that the experiment was over. However, before debriefing them, experimenters asked them to complete a brief survey. Participants

were first asked if they were in a relationship. Ostensibly, participants had no idea that this experiment was about romantic relationships, so participants were asked if they were in a relationship to not arouse suspicion. Also, if a participant indicated that they were not involved in a relationship, we knew that they had broken up with their partner since mass testing earlier in the semester, and we knew to disregard their data. Participants were told that they did not have to complete the survey, and that it had nothing to do with the study they had just completed, but that a research assistant who worked in the lab was collecting information for the Government of the Student Body (GSB) and needed some feedback. The survey was ostensibly gauging the participant's interest in some relationship enhancement seminars that the GSB was considering funding. The survey was kept in a file cabinet drawer away from all of the other experimental materials, which were stored and marked in plain sight on a large shelving unit. The survey was also printed on pink colored paper and in a different font than the rest of the materials, to further separate it from the experiment. Hendrick's (1988) Relationship Satisfaction Questionnaire was embedded into this survey. This survey has been attached as Appendix E.

STUDY TWO RESULTS

Table 12: Descriptive statistics for reaction time

	Dissonance condition	Non-dissonance condition
Long distance relationships	1022.17 (219.19) (n = 35)	1136.41 (358.46) (n = 28)
Geographically proximal relationships	1132.55 (389.26) (n = 41)	993.90 (160.96) (n = 29)

Reaction Time (Arousal)

It was hypothesized that reading a credible news story that says that one's relationship is not as satisfying, fulfilling, or likely to last as a different type of relationship would affect the arousal of participants in both long distance and geographically proximal relationships. To test this hypothesis, a 2 x 2 factorial ANOVA was conducted, with the expectation that there would be a statistically significant interaction between story type and relationship. More specifically, people in long distance relationships who read the story that long distance relationships are bad, and people in geographically proximal relationships who read the story that geographically proximal relationships are bad, should have elevated arousal when compared to participants who read the story that said that their own type of relationship is good. When the analysis was conducted, the results indicated that there was no statistically significant main effect for relationship type ($F(1, 129) = 0.02, p = .92$) or dissonance condition ($F(1, 129) = 0.01, p = .94$). The interaction between relationship type and dissonance condition was statistically significant ($F(1, 129) = 5.63, p = .02$). A test of simple effects found no significant difference in reaction time between the dissonance and non-dissonance conditions for participants in long distance relationships ($F(1, 129) = 2.20, p = .14$), although the pattern in the means suggests that, for people in long distance

relationships, responding was faster in the dissonance condition than in the non-dissonance condition. However, the simple effects test did reveal a marginally significant difference in reaction between the dissonance and non-dissonance conditions for participants in geographically proximal relationships ($F(1, 129) = 3.51, p = .06$). Members of geographically proximal relationships responded more quickly in the non-dissonance condition ($M = 993.90, SD = 160.96$) than in the dissonance condition ($M = 1132.55, SD = 389.26$).

A d coefficient, which indicates the magnitude of the effect size between two groups based on a pooled standard deviation estimate, was computed to gauge the size of the mean difference in reaction time between the dissonance and non-dissonance conditions for members of long distance relationships. The magnitude of that difference was -0.38 , which falls between Cohen's (1992) criteria for a small and a medium-sized difference. For the long distance relationships, the lower reaction time for people in the dissonance condition vs. the non-dissonance condition would seem to provide support for hypothesis four. However, it is more difficult to explain why, when looking at geographically proximal relationships, the d coefficient for the difference in reaction time between the dissonance and non-dissonance conditions is 0.47 , indicating that for people in geographically proximal relationships, the rate of responding was faster in the non-dissonance condition. A faster rate of responding was thought to indicate cognitive arousal, and the dissonance condition was supposed to be more arousing than the non-dissonance condition.

Relationship Satisfaction

Table 13: Descriptive statistics for relationship satisfaction

	Dissonance Condition	Non-dissonance condition
Long distance relationships	30.62 (3.52) (n = 35)	30.89 (2.47) (n = 28)
Geographically proximal relationships	30.25 (5.31) (n = 41)	29.86 (4.22) (n = 29)

It was hypothesized that reading a credible news story that says that one's relationship is not as satisfying, fulfilling, or likely to last as a different type of relationship would affect the arousal of participants only in long distance relationships, because cognitive dissonance (in the form of effort justification) is hypothesized to underlie satisfaction in long distance relationships only. To test this hypothesis, a 2 x 2 (story type x relationship type) factorial ANOVA was conducted, again with the expectation that there would be a statistically significant interaction between story type and relationship. More specifically, people in long distance relationships who read the story that long distance relationships are bad should show changes in relationship satisfaction when compared to people in long distance relationships who read the story that long distance relationships are good and people in geographically proximal relationships who read either type of story. When the analysis was conducted, the results indicated that there was no statistically significant main effect of relationship type ($F(1, 127) = 4.45, p = .28$), or experimental condition ($F(1, 127) = 0.29, p = .89$), and the interaction between relationship type and experimental condition was not significant ($F(1, 127) = 0.21, p = .65$). These results did not support the hypothesis that people in long distance relationships who were in the dissonance condition would have

higher relationship satisfaction than people in geographically proximal relationships and people in long distance relationships who were in the non-dissonance condition.

Although these results did not support hypothesis five, the effect of dissonance on relationship satisfaction can be examined in another way. Participants completed a relationship satisfaction measure at the mass testing data collection session that was used to recruit them to participate in this study. Therefore, a repeated measures ANOVA was conducted to see if the change in relationship satisfaction from the beginning of the semester to when participants completed the study was different for people in long distance relationships who were in the dissonance condition. The results indicated that there was no statistically significant main effect of relationship type ($F(1, 127) = 2.81, p = .38$) or dissonance condition ($F(1, 127) = 5.11, p = .27$). The interaction between relationship type and dissonance condition was not statistically significant ($F(1, 127) = 0.10, p = .75$). Table 14 contains the sample sizes, means, and standard deviations for change in relationship satisfaction from mass testing to the experiment.

Table 14: Descriptive statistics for relationship satisfaction change

	Dissonance Condition	non-Dissonance Condition
Long Distance Relationships	-0.24 (2.93) n = 35	-1.14 (5.66) n = 28
Geographically Proximal Relationships	-0.93 (5.46) n = 41	-1.28 (5.24) n = 29

A *d* coefficient, which indicates the magnitude of the difference between two groups in standard deviation units, was computed to gauge the size of the mean difference in relationship satisfaction change between people in long distance relationships in the

dissonance condition, and people in long distance relationships in the non-dissonance condition. People in long distance relationships in the non-dissonance condition had more relationship satisfaction change than members of long distance relationships in the dissonance condition; the magnitude of that difference was 0.20, which meets Cohen's (1992) criterion for a small effect. The same test was computed to gauge the size of the mean difference in relationship satisfaction change between people in long distance relationships in the dissonance condition, and people in geographically proximal relationships in the dissonance condition. People in geographically proximal relationships in the dissonance condition had more relationship satisfaction change than people in long distance relationships in the dissonance condition; the magnitude of that difference was 0.16, which is slightly smaller than Cohen's (1992) criterion of 0.20 to indicate a small difference. It appears that people in long distance relationships in the dissonance condition had less change in their relationship satisfaction scores than other groups, although the magnitude of this difference was small.

DISCUSSION

Study one examined how people in long distance relationships evaluate the costs in their relationships, and the way these evaluations affect their sense of satisfaction with their relationships. According to social exchange theory, people in long distance relationships should be less satisfied in their relationships to the extent that their relationships are lower in benefits and higher in costs than the relationships of people in geographically proximal relationships. Study one examined both participants' objective estimates of the costs in their relationships and their more subjective assessments of the number of costs in their relationships. It then compared how objective and subjective costs changed over time and how they affected relationship satisfaction in both long distance relationships and geographically proximal couples.

First of all, it must be noted that it was not predicted that levels of subjective or objective costs would differ by relationship type; predictions were only made for the rate of change in costs across time. In terms of objective costs, members of long distance relationships had higher objective emotional and attachment costs, as well as higher total objective costs, than members of geographically proximal relationships. In addition, members of long distance relationships had higher subjective emotional costs, trust costs, and total subjective costs than members of geographically proximal relationships. By contrast, members of geographically proximal relationships had higher subjective financial costs than members of long distance relationships.

These results suggest a few important points. First of all, it is important to measure costs in long distance and geographically proximal relationships. Although it is logical to assume that long distance relationships are more costly, these results suggest that this

assumption is not always accurate. For some types of costs, the assessments of members of long distance relationships and geographically proximal relationships did not differ. People in long distance relationships did not have higher subjective attachment costs, or higher objective trust costs than people in geographically proximal relationships. In addition, people in long distance relationships did not have higher subjective or objective social costs when compared to people in geographically proximal relationships. In the case of financial costs, the objective assessments of members of geographically proximal relationships were actually higher than those of members of long distance relationships.

In study one, there were three main hypotheses. The first two hypotheses were that, from time 1 to time 2, objective costs would have a higher rate of increase in long distance relationships than in geographically proximal relationships. On the other hand, subjective costs would not increase in either group from time 1 to time 2. In other words, members of long distance relationships would experience an increase in objective costs from time 1 to time 2, but this increase in costs would not be reflected in their more subjective assessments of their relationships.

The results provided minimal support for the hypotheses. Turning first to objective costs (hypothesis one), the predicted pattern was only identified for one subtype of costs: financial costs. Participants in long distance relationships indicated that their objective financial costs increased from time 1 to time 2, whereas participants in geographically proximal relationships indicated that their financial costs decreased from time 1 to time 2. When examining the corresponding pattern in terms of subjective costs, the change in subjective financial costs from time 1 to time 2 did not differ as a function of relationship type. In the case of subjective costs (hypothesis two) there was actually a decline from time

1 to time 2 in financial, social, and overall subjective costs. In addition, the decline in overall subjective costs was actually greater for members of long distance relationships than for members of geographically proximal relationships.

Hypothesis three predicted that people whose subjective assessments of the costs in their relationships increased between time 1 and time 2 would have lower relationship satisfaction at time 2. This hypothesis was supported for subjective attachment, social, trust, and overall subjective costs, as well as objective attachment, trust, and overall objective costs. Change in subjective attachment costs was more strongly related to relationship satisfaction for members of long distance relationships than for geographically proximal relationships. Other than subjective attachment costs, there was no difference in the relationship between change in costs and change in relationship satisfaction as a function of relationship type. Participants whose relationships became more costly over time experienced a decline in relationship satisfaction, just as social exchange theory would predict.

Before discussing the implications of these findings, it must be noted that time 1 participants who provided data at time 2 had lower subjective relationship costs than participants who opted not to provide data at time 2. Therefore, the results of study 1 are biased in favor of individuals who had less severe assessments of the level of costs in their relationships at the beginning of the study.

The results from study one are interesting for a variety of reasons. First of all, costs were separated into subjective and objective categories because it was speculated that, at a more subjective level, participants in long distance relationships would not rate their relationships as being more costly than participants in geographically proximal relationships.

Therefore, it would be necessary to measure costs objectively. By asking participants to estimate how many times specific incidences had occurred in a given period of time, it was assumed that the higher level of costs in long distance relationships would be more readily acknowledged by participants than if they were simply asked about their subjective notions about the costliness of their relationships.

However, most of the interesting results in study one were found with the subjective costs variables, as opposed to the objective costs variables. There are several potential reasons for the failure of objective costs to provide much information about long distance relationships. First of all, it is possible that people in long distance relationships are biased in their estimates of how frequently particular costs occur in their relationships. Specifically, it might be dissonance reducing to minimize objective costs as well as subjective costs. This study provided a first attempt at separating subjective and objective costs in long distance relationships, but future studies could have participants keep a daily diary of the objective costs in their relationships to increase the validity and accuracy of objective cost estimates.

Another possibility is that people in long distance relationships are fairly honest with themselves about the level of costs inherent to their relationships. This idea is supported by looking at overall objective costs and overall subjective costs. Specifically, members of long distance relationships had higher overall objective costs, and higher overall subjective costs, as compared to members of geographically proximal relationships. We might expect, if people in long distance relationships are minimizing how costly their relationships are, that they would have higher levels of objective costs, but similar levels of subjective costs, as members of geographically proximal relationships. This was not the case.

The fact that subjective costs decreased more for people in long distance relationships than for people in geographically proximal relationships is intriguing. A similar pattern was not detected for objective costs; although they decreased overall from time 1 to time 2, the rate of decrease did not differ as a function of relationship type. The current study posited the objective costs would rise over time, while subjective costs would remain steady, for people in long distance relationships. The pattern of objective costs declining over time in similar amounts for both groups, while subjective costs declined more for those in long distance relationships, does suggest that people in long distance relationships might be cognitively minimizing the costs their relationships require. When compared to people in geographically proximal relationships, people in long distance relationships have lower subjective costs than their objective costs seem to warrant. However, this result provides weaker support for the hypotheses than was expected.

Finally, it was especially detrimental for long distance relationships if subjective attachment costs increased from time 1 to time 2. The items that comprise the attachment costs involve talking about problems to a partner and feeling better, sharing the small details of one's day with one's partner, engaging in leisure activities with one's partner, and engaging in sexual intimacies with one's partner. These activities all build intimacy, and they could easily be more difficult to engage in if a couple is geographically separated. Long distance couples who subjectively assess these activities as becoming less frequent over time are vulnerable to a decrease in their relationship satisfaction.

It is also possible that the costs inherent in long distance relationships have *truly* been minimized by advances in technology. Instant messaging services that allow people to "chat" in real time, affordable cell phone rates, and the ubiquity of email all make "distance"

seem like an old-fashioned concept. Individuals separated by geography can communicate with each other more frequently and easily than ever before. Notions of the efforts required to maintain long distance relationships might need to be revised in light of the way technology continues to allow individuals separated by miles to feel connected to each other.

Minimizing costs is only one way for members of long distance relationships to minimize the dissonance they may experience. Another way people in long distance relationships could minimize any dissonance they experience is by inflating their sense of satisfaction with their relationships in order to justify the effort their relationships entail. If this route to dissonance reduction takes place, it would not be necessary for people in long distance relationships to cognitively minimize the costs in their relationships; simply increasing their sense of relationship satisfaction would reduce any unpleasant arousal they may experience as a result of expending high levels of effort for their relationships. The relationship amplification route to dissonance reduction was explored in study two.

Study two was designed to examine whether creating cognitive dissonance about long distance relationships, in an experimental setting, affects relationship satisfaction. In this study, the results for reaction time did not turn out as expected. There was a non-significant difference in the predicted direction between dissonance and non-dissonance conditions among long distance participants only. Results for those in geographically proximal relationships showed the opposite pattern; those in the dissonance condition had longer response latencies, which indicates that they were experiencing less arousal.

However, the results for relationship satisfaction were somewhat more in line with the hypotheses. Participants who were in long distance relationships and in the dissonance condition had a lower rate of change in their relationship satisfaction from the beginning of

the semester until they participated in the study, although this difference was small in magnitude and therefore not statistically significant.

Without having clear evidence that participants became emotionally aroused by reading what they believed was a *New York Times* story indicating that their relationship type was inferior to another type, it cannot be concluded that the differences in relationship satisfaction change can be attributed to cognitive dissonance, although the results are suggestive of such an effect; members of long distance relationships, who should be uniquely affected by experiencing cognitive dissonance about their relationships, showed a tendency to react more quickly in the reaction time task and showed the smallest decline in relationship satisfaction over the course of the semester. Future research examining this question should seek to more clearly establish the emotional arousal experienced, ostensibly by both members of long distance relationships and geographically proximal relationships.

There are a few potential reasons why the reaction time results were not consistent with predictions. First of all, it was necessary to restrict the reaction time data to only fifteen trials, a relatively small number. Most reaction time research uses a much larger number of trials to establish reliable patterns in participants' responding. However, in this study, the reaction time portion of the study needed to be short so that there was residual arousal left over to affect the way participants answered the relationship satisfaction questionnaire. Future studies could separate the reaction time task and the relationship satisfaction assessment; participants could be randomly assigned to complete one or the other. For participants who complete the reaction time task, more reaction time trials would be added, and it could be shown that participants in the dissonance condition have a faster rate of responding when compared to participants not in the dissonance condition, suggesting

arousal. For participants who complete the relationship satisfaction questionnaire, it could be shown that participants in long distance relationships in the dissonance condition have lower rates of relationship satisfaction change, when compared to members of geographically proximal relationships and members of long distance relationships in the non-dissonance condition.

Another reason the reaction time results were not consistent with predictions is that the dissonance manipulation was more effective for members of long distance relationships than geographically proximal relationships. Dissonance was manipulated by having participants read a fake news story. One story said that people in long distance relationships have happier, more satisfying, and longer lasting relationships, and the other story said that people in geographically proximal relationships have happier, more satisfying, and longer lasting relationships. The story that said geographically proximal relationships are inferior to long distance relationships may not have been effective in creating dissonance in geographically proximal relationships. It is possible that the latter story was less believable. Another possibility is that the story suggesting that geographically proximal relationships are inferior to long distance relationships was less personally threatening to members of geographically proximal relationships. Relationships in which the members can see each other everyday are the standard, most common type of relationship. A story suggesting that long distance relationships are better may not be assessed as threatening when geographically proximal relationships are normative.

Limitations and suggestions for future research

Although the current research addressed the question of effort justification in long distance relationships using two separate methodologies, it still had significant limitations.

Turning first to the longitudinal study of costs in long distance relationships, because this work was exploratory, the costs subscales were written and created largely on the basis of face validity. A large pool of items completed by a large sample of people in long distance relationships, and exploratory factor analyses, would be welcome methodological advances.

Future studies could more thoroughly examine the predictions of Rusbult's investment model (1980a; 1980b). The current study focused specifically on costs in long distance relationships, but the investment model posits that relationship benefits and comparison level, or our expectations of what we deserve based on our experience in prior relationships, also determines satisfaction. In order to fully test the investment model, two more constructs would need to be included. Comparison level of alternatives concerns the quality of partner and relationship one believes they could find if they ended their current relationship and sought someone new, and investments in the relationship involve time, money and effort that have been contributed to the current relationship and would be lost if it ended. The constructs of comparison level of alternatives and investments both predict relationship stability, rather than relationship satisfaction. The current study was a first step towards testing social exchange theory in long distance relationships; future researchers could assess investment theory constructs to more completely apply the theory.

Moving next to recommendations that pertain to study two, future studies attempting to delineate the role of cognitive dissonance in the relationship satisfaction of people in long distance relationships could use classic dissonance paradigms. For example, a study by Lord, Ross, and Lepper (1979) demonstrated that people process information in a biased way in order to minimize dissonance. In their work, participants' attitudes towards the death penalty were measured. Next, participants were exposed to two studies: one that claimed the death

penalty is an effective deterrent to crime, whereas the other claimed the death penalty is not an effective deterrent to crime. After reading both studies, participants' attitudes towards the death penalty were measured a second time. Despite being exposed to evidence that was clearly contrary to their position, participants held their original opinions more strongly after having been exposed to a study with contrasting findings.

Future research on long distance relationships could model Lord, Ross, and Lepper's (1979) paradigm. First, participants' initial attitudes about long distance relationships would be measured. Next, students would be exposed to two media articles: one that claims that long distance relationships are happier and more satisfying than geographically proximal relationships, and the other article claiming the exact opposite. Finally, participants' attitudes about long distance relationships would be re-assessed to determine whether or not being exposed to evidence that contradicts their attitudes changed their attitudes. However, it is important to establish, as the current study tried to, that not only was cognitive dissonance created, but that it affected assessments of relationship satisfaction (and only for members of long distance relationships). Certainly it is possible to create a sense of cognitive dissonance regarding relationships in people. The true question is whether or not that cognitive dissonance underlies satisfaction for those in long distance relationships. To measure attitudes allows participants a chance to eliminate their feelings of arousal by changing their attitudes, and once participants have minimized their dissonance through attitude change, there may not be enough dissonance left to show an effect on their relationship satisfaction.

One of the main limitations of study two was power. With fewer than 50 participants per experimental condition, the study lacked the statistical power to detect small differences between groups. Although members of long distance relationships are a somewhat select

group of participants, future studies should attempt to recruit more participants to maximize statistical power.

Conclusion

Study one tested the idea that people in long distance relationships subjectively minimize the costs in their relationships. There was little evidence that participants subjectively minimized the costs in their relationships. However, there was evidence that, for members of long distance relationships, those who had lower assessments of the costs in their relationships had higher levels of relationship satisfaction. Furthermore, although objective and subjective costs were higher in the long distance group, their relationship satisfaction did not differ from that of individuals in the geographically proximal group. Study two tested the idea that people in long distance relationships maximize their sense of satisfaction with their relationships. There was some tentative evidence to suggest that people in long distance relationships inflate their sense of relationship satisfaction to reduce cognitive dissonance, but this finding must be replicated before substantive conclusions are drawn.

Long distance relationships are a prevalent phenomenon in our society. Learning more about how they work will be beneficial for a variety of reasons. The more we know about long distance relationships, the more the information gained can help people in this unique and often challenging situation learn to cope. In addition, applying theories from the canon of relationship science to long distance relationships can help to test and refine these theories. Considering the prevalence of long distance relationships, it is somewhat surprising that relationships researchers have neglected to study them. The current two studies contribute towards expanding our knowledge about couples who must spend time geographically separated from each other.

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APPENDIX A

Study 1 Online Questionnaire

Romantic Relationships Survey

INFORMED CONSENT DOCUMENT

Title of Study: Romantic Relationships Survey
Investigators: Kelli A. Gardner, M.S.

This is a research study. Please take your time in deciding if you would like to participate. Please feel free to ask questions at any time.

INTRODUCTION

The purpose of this study is to learn how people think about and evaluate their romantic relationships. You are being invited to participate in this study because you are enrolled in Psychology 101, 230, or 280 at Iowa State University.

DESCRIPTION OF PROCEDURES

If you agree to participate in this study, completing the survey will take 50 minutes or less. You will have an opportunity to complete this survey again in a few months. During the study you may expect the following study procedures to be followed. You will be asked a series of questions about your current romantic relationship. You may skip any question that you do not wish to answer or that makes you feel uncomfortable.

RISKS

While participating in this study you may experience the following risks: You will be asked to reflect on both positive and negative aspects of your relationship. Thinking about disadvantages to your current relationship may make you feel temporarily unhappy.

BENEFITS

If you decide to participate in this study there will be no direct benefit to you. It is hoped that the information gained in this study will benefit society by helping us know how young people think about the negative and positive aspects of their romantic relationships.

COSTS AND COMPENSATION

You will not have any costs from participating in this study. You will be compensated for participating in this study with one extra credit point to be earned in Psychology 101, 230, or

280. If you elect to complete the survey again towards the end of the semester, you will receive a second extra credit point for your psychology class.

PARTICIPANT RIGHTS

Your participation in this study is completely voluntary and you may refuse to participate or leave the study at any time. If you decide to not participate in the study or leave the study early, it will not result in any penalty or loss of benefits to which you are otherwise entitled.

CONFIDENTIALITY

Records identifying participants will be kept confidential to the extent permitted by applicable laws and regulations and will not be made publicly available. However, federal government regulatory agencies and the Institutional Review Board (a committee that reviews and approves human subject research studies) may inspect and/or copy your records for quality assurance and data analysis. These records may contain private information.

To ensure confidentiality to the extent permitted by law, the following measures will be taken. Psychdata.com is an extremely secure, password protected website that allows no one but the primary investigator to access the data. Each participants' data will tagged with a code number rather than his or her name. The primary investigator is the only person who will have access to the data and study records, and they will be kept on password protected computer files. The data will be retained for approximately one year before being erased.

QUESTIONS OR PROBLEMS

You are encouraged to ask questions at any time during this study. For further information about the study contact Carolyn Cutrona via email (ccutrona@iastate.edu) or telephone (515-294-6784). If you have any questions about the rights of research subjects or research-related injury, please contact the Human Subjects Research Office, 2810 Beardshear Hall, (515) 294-4566; austingr@iastate.edu or the Research Compliance Officer, Office of Research Compliance, 2810 Beardshear Hall, (515) 294-3115; dament@iastate.edu

SUBJECT SIGNATURE

Entering your name and date below indicates that you voluntarily agree to participate in this study, that the study has been explained to you, that you have been given the time to read the document and that your questions have been satisfactorily answered.

* Participant's name

*

What is your student ID number (the middle 9 numbers on your ISU card)?

* Please indicate the psychology class for which you are earning extra credit.

- Psych 101
- Psych 230
- Psych 280

What is today's date?

* Are you still in a romantic relationship with the SAME PERSON you were with when you completed this survey earlier in the semester?

- Yes
- No

-----Page Break-----

* Please estimate, as closely as possible, the month and day that the relationship ended.

Which statement best characterizes how your relationship ended?

- I ended our relationship.
- My former partner ended our relationship.
- It was a mutual decision to end our relationship.

* Which statement, in your opinion, best characterizes the likelihood that you and your former partner could get back together?

- It is not at all likely that we will get back together.
- It is not very likely that we will get back together.
- It is somewhat likely that we will get back together.
- It is very likely that we will get back together.

-----Page Break-----

How long have you been in your current relationship?

- One month or less
- Two to six months
- Six months to a year
- A year or more

Where does your partner live?

- In the same town
- Within ten miles
- Within fifty miles
- Within 100 miles
- Within 200 miles
- More than 200 miles away

How frequently do you see your partner, on average?

- Every day
- Several times a week
- Once a week
- Once every two weeks
- Once a month
- Once every two months
- Once every six months
- Once a year
- Less than once a year

Do you consider yourself to be in a long distance relationship?

- Yes
- No
- Unsure

Do you live far enough from your partner, geographically, that is impossible for you to see her or him everyday?

- Yes
- No
- Unsure

My partner does a very good job of meeting my needs.

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Very strongly agree

In general, I am satisfied with my relationship.

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

I would say my relationship is better than most.

- strongly disagree
- disagree
- neither agree nor disagree
- agree
- strongly agree

I often wish I hadn't gotten into this relationship.

- strongly disagree
- disagree
- neither agree nor disagree
- agree

strongly agree

My relationship has met my original expectations.

strongly agree

agree

neither agree nor disagree

disagree

strongly disagree

I love my partner very much.

strongly disagree

disagree

neither agree nor disagree

agree

strongly agree

There are many problems in my relationship.

strongly disagree

disagree

neither agree nor disagree

agree

strongly agree

I spend a lot of money on my relationship each month.

strongly disagree

disagree

neither agree nor disagree

agree

strongly agree

I feel sad because I miss my romantic partner.

- never
- sometimes
- often
- usually

I feel lonely when my partner isn't with me.

- never
- sometimes
- often
- usually

While I'm with my partner, I begin to dread the next time we'll be apart.

- never
- sometimes
- often
- usually

I talk (or write or email) my partner about my problems and feel better afterwards.

- never
- sometimes
- often
- usually

I worry that my partner is cheating on me.

- never
- sometimes
- often
- usually

My partner worries that I will cheat on him or her.

- never
- sometimes

- often
- usually

I miss fun times with my friends because I'm spending time with my romantic partner.

- never
- sometimes
- often
- usually

I miss time with my family because I'm spending time with my romantic partner.

- never
- sometimes
- often
- usually

I feel awkward attending social events without my partner.

- never
- sometimes
- often
- usually

I wish I could spend more time with my partner.

- never
- sometimes
- often
- usually

My partner and I exchange information about the minor or unimportant details in our lives.

- never
- sometimes
- often
- usually

My partner and I engage in leisure activities together.

- never
- sometimes
- often
- usually

My partner and I engage in sexual intimacies.

- never
- sometimes
- often
- usually

-----Page Break-----

Please estimate how much money you spend on your relationship in a typical month. (include money spent on phone bills, travel costs, gifts, meals you pay for, activities you do together that cost money, etc.)

Please estimate how many times a WEEK you feel sad because you miss your romantic partner.

Please estimate how many times a WEEK you feel lonely without your partner.

Please estimate how many times a MONTH you are with your partner and you begin to dread the next time you'll be apart.

Please estimate how many times a MONTH you talk (or write or send an email) to your partner about your problems and feel better afterwards.

Please estimate how many times a MONTH you worry about your partner cheating on you.

Please estimate how many times a MONTH your partner mentions being worried that you will

cheat on him or her.

Please estimate how many times a MONTH you miss a fun activity with your friends because you are spending time with your romantic partner.

Please estimate how many times a MONTH you miss time with your family because you are spending time with your romantic partner.

Please estimate how many times a MONTH you feel awkward attending a social event without your partner.

Please estimate how many times a WEEK you wish you could spend more time with your partner.

Please estimate how many times a WEEK you and your partner exchange information about the minor or unimportant details in your lives.

Please estimate how many times a MONTH you and your partner engage in leisure activities together.

Please estimate how many times a MONTH you and your partner engage in sexual intimacies.

In future semesters, would you be willing to keep an online journal where you would track information about your relationship, in exchange for extra credit or some other form of compensation?

- Yes
- No

-----Page Break-----

DEBRIEFING

Thank you for participating in this survey. Your responses will be used to study romantic relationships in college students.

If you have any questions or comments regarding this survey, please contact Kelli Gardner at kbendick@iastate.edu.

The primary investigator will submit an extra credit card for you. You will receive a confirmation email in 24-48 hours informing you that an extra credit card has been submitted for you.

Thanks again.

Please click on "Submit"

powered by www.psychdata.com

APPENDIX B

Study 1 Recruitment Letter

Psychology student,

Do you want to participate in psychological research and earn extra credit while doing it? Participate in my online survey! Because you indicated in mass testing that you are currently involved in a romantic relationship, you are eligible to participate in my study.

Just follow these simple steps to participate:

- 1.) Go to www.psychdata.com.
- 2.) In the box that says, "Go to survey #", type in **7219**.
- 3.) The site will ask for a password before it will open the survey for you. The password is "**cyclones**."
- 4.) Read the informed consent portion carefully.
- 5.) Be sure to enter your name and the date...we won't know who to give the extra credit point to if you don't enter your real name. Your responses, however, will be completely anonymous.
- 6.) Complete the survey. Feel free to skip any questions you'd rather not answer. Participation will take less than 50 minutes and you'll receive **ONE** extra credit point.

That's it! The psychdata.com site is extremely secure and password protected to ensure the confidentiality of your data. My research team will complete an extra credit card, submit it for you, and send you a confirmation email so you know that you have received the extra credit you earned. **AND...you will have the opportunity to complete the survey again at the end of the semester to earn ANOTHER extra credit point.**

Participate today...after October 10, 2004, we won't be collecting data again until the end of the semester, so **DON'T** put it off! Log on to psychdata.com today.

Sincerely,

Kelli Gardner
kbendick@iatate.edu

PhD Candidate
Psychology Department
Iowa State University

APPENDIX C
Media Usage Questionnaire

In a typical day, which forms of media do you view, listen to, or use at least once? (check all that apply)

- Television
- Newspapers
- Magazines
- Movies
- Video games
- Internet
- Radio
- Music CD's or MP3's

Please rank how frequently you view, listen to, or use each form of media, with 1 being "most frequent" and 8 being "least frequent."

- Television
- Newspapers
- Magazines
- Movies
- Video games
- Internet
- Radio
- Music CD's or MP3's

Please estimate how much time, on a typical day, you spend viewing, listening to or using the following media?

- Television
 - a.) 15 minutes or less
 - b.) 15 minutes-1 hour
 - c.) 1-2 hours
 - d.) 2-3 hours
 - e.) 3-4 hours

f.) More than 4 hours

_____ Newspapers

- a.) 15 minutes or less
- b.) 15 minutes-1 hour
- c.) 1-2 hours
- d.) 2-3 hours
- e.) 3-4 hours
- f.) More than 4 hours

_____ Magazines

- a.) 15 minutes or less
- b.) 15 minutes-1 hour
- c.) 1-2 hours
- d.) 2-3 hours
- e.) 3-4 hours
- f.) More than 4 hours

_____ Movies

- a.) 15 minutes or less
- b.) 15 minutes-1 hour
- c.) 1-2 hours
- d.) 2-3 hours
- e.) 3-4 hours
- f.) More than 4 hours

_____ Video games

- a.) 15 minutes or less
- b.) 15 minutes-1 hour
- c.) 1-2 hours
- d.) 2-3 hours
- e.) 3-4 hours
- f.) More than 4 hours

Internet

- a.) 15 minutes or less
- b.) 15 minutes-1 hour
- c.) 1-2 hours
- d.) 2-3 hours
- e.) 3-4 hours
- f.) More than 4 hours

 Radio

- a.) 15 minutes or less
- b.) 15 minutes-1 hour
- c.) 1-2 hours
- d.) 2-3 hours
- e.) 3-4 hours
- f.) More than 4 hours

 Music CD's or MP3's

- a.) 15 minutes or less
- b.) 15 minutes-1 hour
- c.) 1-2 hours
- d.) 2-3 hours
- e.) 3-4 hours
- f.) More than 4 hours

In a typical day, which forms of media do you view, listen to, or use for entertainment purposes?
(check all that apply)

 Television Newspapers Magazines Movies

Video games

Internet

Radio

Music CD's or MP3's

In a typical day, which forms of media do you view, listen to, or use to keep up with the news and current events? (check all the apply)

Television

Newspapers

Magazines

Movies

Video games

Internet

Radio

Music CD's or MP3's

For lab use only:

MEDIA ARTICLE: _____

APPENDIX D

Media Stories

PRINTER FRIENDLY FORMAT GARDEN STATE THE New York Times
 SPONSORED BY NOW PLAYING IN THEATERS

August 27, 2004

Long distance relationships happy & satisfying

By THE ASSOCIATED PRESS

CAMBRIDGE, MASSACHUSETTS, Aug. 26 (AP)--According to a recent study by researchers at Harvard University, people in long distance relationships are happier than those in more traditional relationships who are not geographically separated from their romantic partners.

"It appears, overall, that people in long distance relationships adjust well to being apart and their relationships appear to be better for it," Dr. Stacy Walsh, the primary author of this study, said. "Their relationships are more intimate, more satisfying, and healthier." Walsh acknowledged that these findings were somewhat surprising. "Indeed, most people are under the impression that being in a long distance relationship is a negative experience. To the contrary, my research team found that the benefits of long distance relationships, including not taking the partner for granted and not fighting about small or insignificant details, increase happiness and relationship stability."

Walsh's study tracked 204 members of long distance relationships, and 196 members of geographically close relationships over an 18-month period. Not only were members of long distance relationships happier with their partners, but their relationships were less likely to end; only 17% of the long distance couples broke up during the course of the study, compared to 41% of the traditional couples, Walsh indicated.

Zachary Price, a freshman at Harvard and a member of a long distance relationship, said his personal experience echoes the themes of Walsh's research. "When I had to leave for college, my girlfriend and I thought being separated would be tough," Price explains. "It turns out that we both really like this arrangement. We both have time to pursue our own activities and interests, and when we get to spend time with each other, we really cherish it. I would say our relationship has improved since we started being in a long distance relationship last year."

Walsh's study, "Does distance make the heart grow fonder? The superiority of long distance relationships" will appear in November's issue of the *Journal of Personality and Social Psychology*, a prestigious and highly respected journal.

August 27, 2004

Long distance relationships unhappy & unsatisfying

By THE ASSOCIATED PRESS

CAMBRIDGE, MASSACHUSETTS, Aug. 26 (AP) - According to a recent study by researchers at Harvard University, people in long distance relationships are not as happy as those in more traditional relationships who are not geographically separated from their romantic partners.

"It appears, overall, that people in long distance relationships do not adjust well to being apart and their relationships appear to be worse for it," Dr. Stacy Walsh, the primary author of this study, said. "Their relationships are less intimate, less satisfying, and less healthy." Walsh acknowledged that these findings were not surprising. "Most people are under the impression that being in a long distance relationship is a negative experience. Indeed, my research team found that the disadvantages of long distance relationships, including spending a limited amount of time together and communicating primarily via telephone and email decrease happiness and relationship stability."

Walsh's study tracked 204 members of long distance relationships, and 196 member of geographically close relationships over the past 18 months. Not only were members of long distance relationships less happy with their partners, but their relationships were more likely to end; only 17% of the traditional couples broke up during the course of the study, compared to 41% of the long distance couples, Walsh indicated.

Zachary Price, a freshman at Harvard and a member of a long distance relationship, said his personal experience echoes the themes of Walsh's research. "When I had to leave for college, my girlfriend and I thought being separated would be tough," Price explains. "It turns out that we were right: we both really dislike this arrangement. It seems like we never get enough time together, and we miss seeing each other everyday and sharing the little moments in our lives. I would say our relationship has deteriorated since we started being in a long distance relationship last year."

Walsh's study, "Does distance make the heart grow fonder? The inferiority of long distance relationships" will appear in the November's issue of the *Journal of Personality and Social Psychology*, a prestigious and highly respected journal.

APPENDIX E**CCA RELATIONSHIPS SURVEY**

Because satisfying romantic relationships are good for both our mental and physical health, ISU's Center for Collegiate Affairs (CCA) is considering asking the Government of the Student Body (GSB) to fund a series of relationship enrichment seminars to be held during Spring semester, 2005. We are currently trying to gauge interest in the seminars.

How serious is your relationship?

- We are seeing each other.
 We are dating exclusively.
 We have discussed marriage.
 We are engaged.
 We are married.

How long have you and your partner been together?

Please answer the following questions using this scale:

- 1) Strongly agree
- 2) Agree
- 3) Neutral or undecided
- 4) Disagree
- 5) Strongly disagree

- In general, I am very satisfied with my relationship.
 My partner does a very good job of meeting my needs.
 I love my partner very much.
 I would say my relationship is better than most.
 I often wish I hadn't gotten into this relationship
 My relationship has met my original expectations.
 There are many problems in my relationship.
 I would be interested in attending a relationship enrichment workshop.
 My partner would be interested in attending a relationship enrichment workshop.

Please rank the following seminars, with 1 indicating "most interesting" and 5 indicating "least interesting."

- Improving your communication
 Jealousy: Combating the green eyed monster
 Pre-marital preparation retreat
 Effective conflict management
 Six secrets of happy couples

Suggestions for possible seminar topics: