RELATIONSHIP FUNCTIONING BEFORE AND DURING THE DIGITAL AGE

BY

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DISSERTATION

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ABSTRACT

Most research on relationship functioning has shown that people's satisfaction, quality of alternatives, and investment size predict relationship commitment. However, few studies have examined the antecedents to relationship commitment and its predictors, and whether the passage of time and societal changes in technology use may be associated with people's relationship functioning. The association between time, technology use, and relationship functioning were examined in two studies. The first was a meta-analysis that included 205 independent samples (NTotal = 48,253) collected from diverse populations, ranging from early stage long-term romantic relationships to well established couples who have been married for decades. The second was an online survey administered to 270 Amazon MTurk users and an undergrad sample of 245 psychology credit subject pool participants. This survey was designed to examine the association between technology use and relationship functioning. The data that were collected in the survey included the investment model data, technology use, attachment, Big Five personality traits, loneliness, perceived partner responsiveness and disclosure, and demographic information. Results showed that relationship functioning has not changed from the 1990s to present day (Study 1) and did not vary as a function of technology use (Study 2). In addition, most of the variation in relationship functioning was due to individual differences such as attachment insecurities, differences in participants' perception of how rewarding interactions were, perceived partner responsiveness, and disclosure. The limitations of this work and the implications for the future research of relationship functioning are discussed.

Keywords: Investment model, relationship functioning, commitment, social networks

To Carmel and Ellie Audrey - the loves of my life, and my greatest inspiration.

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CHAPTER 1: INTRODUCTION

In the past few decades, the ways in which people *find* relationship partners and *interact* with them have fundamentally changed. The early 2000's marked the meteoric rise of social media platforms, such as Facebook, that have offered users novel ways to access potential partners, and communicate. Yet the influence of these platforms on relationship functioning remains unclear. On the one hand, social technologies have afforded people opportunities to connect with what is happening in their romantic partners' lives, help them feel more emotionally attached, or provide a platform to help them express their emotions (Pew, 2015). Conversely, the same technologies have also been linked to negative outcomes; such as increased jealousy; partner surveillance or monitoring, and increased chances of infidelity, breakup, or divorce (Fox et al., 2014; Marshall, Bejanyan, Castro, & Lee, 2013; Elphinston & Noller, 2011).

The goal of this research was to answer two questions: (a) Have the average levels of relationship functioning changed over time, as a function of the cohort and the introduction of new technologies? (b) Which aspects of technology use may be associated with relationship functioning? For the purposes of this research, I defined relationship functioning using the core constructs entailed by the Investment Model (Rusbult, 1983)—one of the leading theoretical frameworks in the study of close relationships. According to this model, commitment is defined as the intention to stay in a relationship, and it is driven by people's satisfaction with their relationships, but also their relationship alternatives, and their investment level in their current relationship (Rusbult & Buunk, 1993). I begin by reviewing the theory and research from this perspective, followed by a review of research into the influences technology has had on romantic relationships. Finally, I describe two studies that were designed to test whether relationship functioning has changed over time, and whether technology use may be associated with that

process. In the first study, I conducted a meta-analysis designed to investigate *whether* relationship functioning has changed over the past decades. In the second study, I conducted two online surveys to determine how the contemporary use of social media may be associated with relationship functioning. The ultimate goal of this work was to reveal some of the ways in which technology may have shaped our lives—not just our personal identities, but the way in which we relate to and love others. I also wished to produce research that may be useful in helping people navigate an era in which technology, relationships, and our identities are becoming indistinguishable.

Interdependence Theory

Why is it that some couples live happily forever after, whereas others break-up? Motivated by the steep rises in divorce rates in the 1960's and 1970's, psychologists dedicated significant effort to studying the mechanisms that influence relationship functioning (Clark & Reis, 1988). In the 1950s, Thibaut and Kelley proposed Interdependence Theory (Thibaut & Kelley, 1959; Kelley & Thibaut, 1978) as a theoretical framework to explain relationship dynamics. The novelty of Interdependence Theory was its focus on the *dyadic* level, and the relevance of between-person interactions, that in turn foster interdependence. The theory posits that as relationship partners interact, they experience rewards and costs, from pleasure or gratification on the positive end of the spectrum, to pain and embarrassment on the negative end (Rusbult & Buunk, 1993). With time, the nature of the interactions, and the subjective perceptions of those interactions create interdependence, and motivation for relationship maintenance (Blau, 1967).

Specifically, interactions have a functional role, such that each interaction has some personal benefit or cost, operationalized by the affective experience created through the

interaction. Each interaction can be experienced as positive, negative or neutral, and in turn the subjective perception of interactions influence people's satisfaction and security in their relationships. In the language of interdependence research, interactions can be "gratifying," or "pleasurable," in cases in which a person has enjoyed the aftermath of his or her involvement with someone else. Conversely, interactions can be embarrassing, anxiety provoking, or consciously effortful in a negative sense, in which cases people will be less motivated to further interact with one another (Thibaut & Kelley, 1959).

In the nascent stages of interdependence research, relationship scholars focused on the influences of positive affect on dependence (Rusbult, 1998). Therefore, interdependence theory highlighted relationship *satisfaction* as the first predictor of dependence and persistence in relationships. The more partners experienced positive affect in their interactions with each other, the more their dependence would grow. If partners felt understood, cared for, and had their needs fulfilled – they were more likely to feel good about their relationship. More specifically, according to the interdependent perspective, individuals assess their relationship outcomes, and satisfaction, as a function of their *comparison level* (CL), a personal standard for relationship satisfaction (Thibaut & Kelley, 1959). The comparison level is influenced by several factors, including experiences in past relationships, the perceived situation of one's partner, and information about friends' relationships. The CL is thus the benchmark according to which people ascertain whether they are satisfied with their current romantic partner.

However, interdependence scholars recognized a crucial limitation in prior relationship research – it was not uncommon for people to remain in *unsatisfying* relationships, or to end satisfying ones. In some cases, partners remained together even though both sides were unhappy. In other cases, partners separated even though both partners were quite content. In addition,

satisfaction levels are not typically a constant in romantic relationships, and yet some relationships are never threatened by fluctuations in satisfaction, whereas other relationships abruptly end when satisfaction temporarily goes down. Given these phenomena, interdependence theory includes an additional factor predicting dependence – the quality of available alternatives to a relationship (Kelley & Thibaut, 1978).

In the context of interdependence theory, the quality of alternatives to a relationship is the desirability of other people who could potentially serve to fulfill an individual's needs outside of their current relationship (Thibaut & Kelley, 1959). According to the theory, people use a *comparison level for alternatives* (CL-alt) in order to decide whether to leave their current relationship or not. The comparison level for alternatives is operationalized as the lowest level of relational outcome a person would accept, given the available pool of opportunities. Depending on the nature of the needs, alternatives could include another potential romantic partners, a friend, a family member, or the alternative of ending the current relationship and fulfilling one's own needs. In other words, in addition to the connection between high satisfaction and stronger chances of persisting in a relationship, interdependence theory posits that individuals will also be more likely to persist in relationships when they have no superior choices.

The Investment Model

Though incorporating the quality of alternatives in addition to relationship satisfaction provided a better explanation for relationship persistence, researchers noted that those two factors cannot fully explain why people remain in their relationships (Rusbult, 1980; Rusbult, 1983). It is not rare for people to be unsatisfied in their relationship, have plenty of attractive, viable alternatives, and yet not break-up from their partners. This is where the Investment Model

extended Interdependence Theory, by suggesting that a person's investment size also influences relationship persistence, in addition to satisfaction and the quality of alternatives.

People's investment is defined as any resource, whether material or otherwise, that would decline in value or be lost if the relationship ended (Rusbult, 1998). The *size* of the investment could be its objective magnitude, its subjective importance, or a combination of both. As relationships progress from the initial acquaintance stage, people tend to invest considerable time and effort into their relationships, in addition to sharing material resources, or more indirect investments such as in children, or mutual friendships. As the investment level rises, so do the costs of ending the relationship, thus enhancing chances of persistence, because of the deeply ingrained fear of losing all the resources tied to the relationship.

The Investment Model also extended Interdependence Theory by including commitment as a mediator between the three factors producing dependence, and persistence in a relationship. According to the Investment Model, people's commitment levels are defined as their intent to persist in a relationship (Agnew, Van Lange, Rusbult, & Langston, 1998). Specifically, the more individuals are satisfied, invested, and lack alternatives – the more they depend on their relationships. In turn, as they become increasingly dependent, individuals also tend to develop strong commitment, "a sense of allegiance" as described by Rusbult (1998).

Empirical Review of the Investment Model

Rusbult began testing the Investment Model in the early 1980s (Rusbult, 1980; Rusbult, 1983). In early studies she asked participants to read vignettes describing hypothetical couples, varying the proposed predictors of commitment, to explore their effect on relationship functioning. Further studies included cross-sectional examinations of participants' own relationships, and a multi-wave longitudinal study examining how changes in satisfaction,

quality of alternatives, and investment size predicted commitment and relationship longevity (Rusbult, 1983). Together, these early studies provided evidence for the fact that studying relationship satisfaction alone would not suffice if researchers wished to understand relationship persistence. Satisfaction, alternatives, and investments all uniquely contributed to relationship commitment, which in turn was the strongest predictors of relationship persistence.

In the years since its inception, the Investment Model has been applied to study participants of diverse ethnicities (Lin & Rusbult, 1995), sexual orientations (Kurdek, 1991), abusive relationships (Rhatigan & Axsom, 2006), socially marginalized relationships (Lehmiller & Agnew, 2007), and friendships (Hirofumi, 2003). All of these studies revealed that satisfaction, quality of alternatives, and investment size are uniquely associated with commitment. In addition, beyond the context of close relationships, the Investment Model has also robustly predicted commitment in several other contexts, such as organizational and job settings (Oliver, 1990), college students' commitment to their schools (Geyer, Brannon, & Shearon, 1987), and commitment to medical treatment (Putnam, Finney, Barkley, & Bonner, 1994).

What are the antecedents to the Investment Model variables? Most research into the predictors of satisfaction, alternatives, investment and commitment has focused on the interpersonal behaviors, or individual characteristics that may predict these outcomes. For example, on the interpersonal level, studies have shown that commitment, pro-relationship behaviors, and trust are all related via a mutual cyclical growth process in which each behavior feeds into the relationship functioning cycle (Wieselquist et al., 1999). On an individual level, recent research has shown that perceived partner responsiveness may shape Investment Model variables which, in turn, shape commitment. In addition, individual differences in attachment

moderated some of those dynamics, such that people who were insecurely attached were less likely than others to perceive their partner as responsive (Segal & Fraley, 2015). However, though researchers have studied the impact of individual or dyadic characteristics on relationship functioning, they have given less attention to the implications of technology on the behaviors and interactions between romantic couples.

Technological Advancements and Relationship Functioning

Of the multitude of factors that may affect romantic relationships, one area that has been comparatively understudied in social psychology is the influence of social technologies on romantic relational processes. Given the exponential growth and advancements in technology platforms and use, researchers are struggling to keep up with the novel possibilities that digital technologies are providing their users. One of the most pervasive and influential current technologies has been social networking technologies (SNTs). The largest of these, Facebook, currently has more than 1.5 *billion* active users worldwide, most of whom are actively using the social network on a daily or weekly basis (Facebook, 2015). Thus, it is unsurprising that recent research indicates that SNTs play a crucial role in all stages of relationships (e.g., Trepte & Reinecke, 2013; Carpenter & Spottswood, 2013; Papp, Danielewicz, & Cayemberg, 2012). SNTs enable users to post relationship related content, and share it with their friends. In essence, social network technologies have given people the ability to broadcast their relationships to a much wider audience than ever before (Fox, 2014). In addition, SNTs users have gained access to their online friends' lives, and thus a much broader social network, and a substantially larger pool of potential romantic partners, including a substantial amount of *their* information. Finally, social networks offer users a multitude of new ways to communicate with their romantic partners, and share moments even when they are physically apart. Social technologies therefore have the

potential to significantly alter romantic relationship processes by fundamentally redefining,

access to potential relationships, communication with romantic relationship partners, and privacy

in current relationships.

The Potential Consequences of Technology for Interpersonal Functioning

In light of innovations in technology and communications, researchers have debated

whether these technologies have positive or negative consequences for psychological well-being

and interpersonal functioning. For the most part, research has focused on the negative effects of

social media use and romantic relationship outcomes. For example, Muise et al. (2009) have

studied the role of Facebook in creating jealousy between romantic partners. Their main

argument has been that individuals leave a digital footprint, which in turn can be constantly

observed by their romantic partners. In turn, people may become jealous if they witness their

partners connecting with, or receiving public messages from other potential mates. In the digital

age, people are privy to more interactions between their romantic partners and third parties than

they were in the past -- interactions that could be interpreted as potential infidelity markers, or

honest acts of friendship and networking. Those interpretations could then potentially negatively

influence people's satisfaction with their relationships, and ultimately their commitment. Indeed,

there is no shortage of evidence that behavior on social networks can translate into romantic

relationship distress and ultimately dissolution (Fox et al., 2014), or other negative consequences

such as jealousy (Utz & Beukeboom), or other forms of conflict (Rueda, Lindsay, & Williams,

2015).

There has been some research indicating that there are also *positive* effects related to

social media use and romantic relationship outcomes. Recent research has shown that a majority

of young adults report that social media makes them "feel more connected with what is going on

in their significant other's life" (PEW, 2015). Further results showed that participants also reported that social media "offers a place for them to show how much they care about their significant other." These young adults are what is known as "digital natives", a term coined by the education scholar Marc Prensky (2001) for young adults who were born into the age of modern technology, and who "speak" the language of technology as native speakers. These digital natives also consider small acts such as changing one's relationship status as a major step in modern relationships, with trickle down effects shifting the dynamics in the "offline relationship" (Mod, 2010). In addition, Mod (2010) also found that when people publicly display their affection on social networks, their partners value these public signs of affection.

Potential Broader Impacts

For the past few decades, the Investment Model has provided a practical theoretical framework for understanding and explaining the causes and consequences of commitment. It originated as a model to understand why people remain in romantic relationships, and has subsequently been used to examine commitment across relationship types and contexts. It has also been utilized to examine the specific ways in which commitment brings about persistence, the specific thoughts and actions that differentiate people based on their level of commitment.

However, in the decades that have passed since researchers began to examine romantic relationship functioning, the ecosystem in which relationships exist has fundamentally shifted. In the distant past, geographical proximity was the primary predictor of relationship formation, people committed to their partners at a much younger age, and marriage was mostly a means to achieve security and financial stability, rather than happiness and love (Coontz, 2006). In present times, geographical proximity is no longer a constraint when searching for a partner, as people are literally carrying a boundless pool of potential romantic partners in their pockets. People are

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committing to long-term relationships later on, and they are reporting different motivations to do so compared to just a few decades ago (Coontz, 2006).

Most importantly, technology is providing us all with romantic freedoms and choices that never existed before, however the impact of those freedoms remains unclear. One can imagine that social media could have negative implications for relationship commitment, because having a constant view into the multiple alternatives to your current relationship could be detrimental. Some research has supported this notion, showing that technology has led to an increase in negative phenomena such as cheating, snooping on one's partner or jealousy (Fox, Osborn, & Warber, 2014; Fox & Tokunaga, 2015). On the other hand, being this technology may also serve as a reminder that the alternatives, although numerous, are not necessarily appealing. In turn, this may increase people's satisfaction with the relationships they already have, and improve their communication with current romantic partners. Some research has supported this possibility, showing that technology allows couples to connect more intimately, share meaningful experiences and express their emotions more authentically (Bryant & Marmo, 2009; Hertlein, 2012).

Technology has therefore clearly shifted the ways in which people find relationships, but also how they interact once they are in a relationship. It has introduced both opportunities and obstacles to the romantic relationships domain. It is possible, even plausible, that technology has changed not just the access people have to potential partners, but also the way people perceive their future partners, and their current relationships. It is also just as plausible that the negative and positive forces exerted by technology on relationships balance out in the aggregate, and therefore do not make a difference. As the adoption of technology becomes ubiquitous, it

becomes ever more important to understand the association between technology and relationship functioning.

Overview of the Studies

The studies in this dissertation were designed to investigate *whether* average levels of relationship functioning have changed over time, and, if so, whether those changes vary as a function of the introduction of new technologies. In Study 1 I examined whether average levels of relationship functioning (i.e. commitment and its predictors) have changed over time. To answer this question, I conducted a meta-analysis, searching the literature for Investment Model and relationship functioning related keywords, and then computed meta-analytic estimates of relationship functioning variables across time. I also examined how relationship functioning varies as a function of changes in the use of specific technologies (e.g. mobile phone adoption, social network technologies). This information was collected from the PEW research center data on internet and tech usage (PEW, 2015)

The purpose of the first study was to examine how social network technologies shape relationship functioning from a historical perspective—examining the Investment Model relationship variables over time, before and after the advent of certain technologies. However, although we live in a highly connected digital age, there is substantial variability in the extent to which people use social media. Therefore, in Studies 2a and 2b, I aimed to examine whether social network technology use covaries with relationship functioning, within a specific slice of history (i.e., now). I used a correlational design to examine the associations between technology use and relationship functioning. I assessed people's technology usage habits, such as how they interact with their partner and others, and which roles technology plays in their relationships. Regarding relationship functioning, I measured Investment Model variables. I also included

individual difference measures to assess whether specific personality traits, attachment styles or other individual characteristics are related to the prevalence of specific behaviors when using technology in relationships. In short, I aimed to learn more about the ways technology adoption has (or has not) led to changes in romantic relationship functioning across time.

CHAPTER 2: STUDY 1 - META-ANALYSIS OF RELATIONSHIP FUNCTIONING ACROSS TIME

To examine whether relationship functioning variables have changed as a function of time, I conducted a meta-analytic review of past work that has examined relationship functioning (i.e., studies that used the Investment Model framework). Study 1 had two goals. First, I sought to estimate whether people's average levels of relationship satisfaction, quality of alternatives, investment size, and commitment have changed over time. Second, I sought to examine how relationship functioning has varied as a function of *changes* in the use of mobile phones, social networks, and messaging technologies. This work therefore expands on previous meta-analyses that have focused on the associations *between* Investment Model variables, or other stages of relationship development (i.e. relationship dissolution) (Le & Agnew, 2003; Le, Dove, Agnew, Korn, & Mutso, 2010).

Method

Review and Inclusion Criteria

To locate studies, I conducted a search on *PsychInfo, PsychArticles, Proquest Dissertations and Theses,* and *Google Scholar,* using the following keywords: ("Investment Model"), (investment AND alternatives AND satisfaction AND commitment), (relationship functioning), (investment OR alternatives OR satisfaction OR commitment). In addition, I searched for any paper that cited the original three articles published by Rusbult on the Investment Model applied to interpersonal relationships (Rusbult,1980a, 1980b, 1983) and any paper that cited the Investment Model Scale article (Rusbult, Martz, & Agnew, 1998) for all reports available from 1998 to 2016. To supplement this search, I also reviewed the reference list for two previous meta-analyses of the Investment Model (Le & Agnew, 2003; Le, Dove, Agnew, Korn, & Mutso,

2010). I also directly contacted leading researchers in the romantic relationships field to request unpublished data, and sent a request to the e-mail list of the Society for Personality and Social Psychology. My search extended through May 2016 and yielded 893 potentially eligible articles, which were subsequently screened for inclusion in the current meta-analysis based on several inclusion criteria. The articles were screened for inclusion in the meta-analysis based on the following inclusion criteria:

1. Studies that specifically utilized the Investment Model Scale measure (Rusbult, Martz, & Agnew, 1998). Investment Model research began in the 1980s, however the scale currently used to measure the Investment Model variables was only developed in 1998 (Rusbult, Martz, & Agnew, 1998). The fact that researchers were using different measures before and after the development of the Investment Model scale introduces scaling issues. Thus, I only included studies that used the Investment Model scale (Rusbult, Martz, & Agnew, 1998).

2. Studies that reported using a subset of the Investment Model variables, or a full set of Investment Model results.

3. Studies that included a sample or multiple samples of *romantic* couples.

4. Studies were excluded if they did not contain appropriate statistics (i.e. means and standard deviations) of the Investment Model variables. However, if a study was otherwise eligible but did not contain appropriate statistics, I attempted to contact the study's authors to retrieve usable data (in this case, means and standard deviations.)

Of the 893 papers considered for inclusion in this meta-analysis, 173 articles met all inclusion criteria (5% unpublished). This provided me with 205 statistically independent samples with a total N of 48,253 participants. Samples ranged in mean age from 18.5-57 years ($M = 24.44$

years, *SD* = 6.81 years) and were on average 61% female (*SD* = 26.04%). Further, samples were on average 70% White or European-American (*SD* = 6%), 12% Asian or Asian-American (*SD* = 29%), 7% Black or African-American (*SD* = 21%), and 5% Hispanic/Latino(a) (*SD* = 12%). Most papers did not include detailed education and income details, therefore descriptive information for these variables are not included.

Coding of Outcomes

For the purposes of the main meta-regression analyses, I coded the means and standard deviations of all available Investment Model variables (satisfaction, quality of alternatives, investment, and commitment) in each study, in addition to the reliability of the measurements (Cronbach's Alpha). For all variables, effect sizes were recorded such that higher positive values indicate higher levels of each named construct. In addition, I recorded the following general study characteristics: (a) article title, (b) authors, (c) publication, (d) year study was published, (e) year of data collection[1], and (f) location of the study. I then coded the following study characteristics: (a) sample size, (b) dyadic data (yes/no), (c) paid study (yes/no), (d) type of sample (university, community, mixed), (e) mean age, (f) percent of females, (g) percent of males, (h) average relationship duration, (i) participant ethnicities, (j) relationship type (dating/married/mixed), (k) rater (self/partner), (l) heterosexual or homosexual sample, (m) method, (n) experimental (yes/no), (o) clinical sample (yes/no), (p) negative circumstances (such as abusive relationships, yes/no). An example of the coding sheet is shown in Table 1.

Results

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[1] To perform the analyses examining change in Investment Model variables over time, I coded the year that the data were collected. If this information for year of data collection was not provided, then I coded the data collection as 2 years prior to the study's publication, based on prior knowledge of the typical time to publication in the field. If the sample was not published, such as conference articles and dissertations, I coded the year of data collection as the year it appeared in the conference, or one year before the dissertation or masters was completed.

All analyses were conducted in R using the meta-analytic software package *metafor*,

version 1.9.8 (Viechtbauer, 2010). All analyses were based on random-effects models.

Prior to meta-analyzing the samples, I conducted a test of publication bias[2] to address any

potential threats to the validity of the meta-analysis. Given that the key focus in this study is the

means of the various relationship variables across time, I examined whether there was a

symmetric distribution of means in the funnel plots. If publication bias is a potential problem,

then the observed means should be asymmetrically distributed around the overall mean. The

funnel plots (presented in Figures 3-10) reveal no apparent evidence of publication bias.

Although there is substantial heterogeneity across sample means, those means are centered on

the overall estimate and neither appear to be higher nor lower as a function of sample size or

precision.

For the main analysis I conducted a regression for each of the four relationship outcomes

(i.e. relationship satisfaction, alternatives, investment, and commitment) on year, using the

Restricted Maximum Likelihood Estimator method (Viechtbauer, 2005). Viechtbauer

recommends the restricted maximum likelihood estimator as it does not suffer from the bias

issues with the DerSimonian–Laird and Hunter–Schmidt, while also being substantially more

efficient than Hedges' estimator. That said, I ran all of my analyses using the Hedges (1981)

estimator in addition to the REML estimator, and there were no substantial differences in the

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[2] One should note that given the focus of this meta-analysis (sample means for the relationship variables), there is no
reason to expect any publication bias. Regardless, I planned to use one of two formal symmetry based methods: the
"trim and fill" method (Duval & Tweedie, 2000), or Egger's Test of the Intercept (Egger, Smith, Schneider, &
Minder, 1997) to establish whether there was any publication bias. However, symmetry methods are not robust to
violations of the assumption of sampling error being the sole source of variance (e.g., moderator variance; Terrin et
al., 2003), therefore they cannot be used when there are moderators in the model, such as in the case of the meta-
regressions I ran for this study.

results. Therefore, all the results reported in this chapter were calculated using the REML estimator.

First, I regressed the relationship commitment means from the meta-analytic database (k = 162) onto the year of each sample's data collection, weighted by inverse variance. The results were not statistically significant (B = −.016, p = .35). In other words, there has been no systematic change in relationship commitment over the last 18 years, from 1998 to the present day. This lack of change over time is demonstrated in Figure 11.

Second, I regressed the relationship satisfaction means from the meta-analytic database (k = 135) onto the year of each sample's data collection, weighted by inverse variance. The results were not statistically significant (B = −.037, p = .10). In other words, there has been no systematic change in relationship satisfaction over the last 18 years, from 1998 to the present day. This lack of change over time is demonstrated in Figure 12.

Third, I regressed the relationship investment means from the meta-analytic database (k = 78) onto the year of each sample's data collection, weighted by inverse variance. The results were not statistically significant (B = −.026, p = .35). In other words, there has been no systematic change in relationship investment over the last 18 years, from 1998 to the present day. This lack of change over time is demonstrated in Figure 13.

Finally, I regressed the relationship quality of alternatives means from the meta-analytic database (k = 74) onto the year of each sample's data collection, weighted by inverse variance. The results were statistically significant (B = .093, p = .003). There has been a systematic rise in the perception of the quality of relationship alternatives over the last 18 years. This change is illustrated in Figure 14. I ran an additional analysis in which I added a quadratic term to the regression equation (after centering Year) to evaluate whether there is a non-linear relationship

between year and quality of alternatives. The quadratic term was not statistically significant (B = -.005, p = .50).

As additional analyses, I had initially planned to use two datasets from PEW as a proxy of technology adoption and usage: (1) social media usage among American adults, from 2005-2015 (PEW, 2015) and (2) mobile phone ownership over time, from 2002 – 2015 (PEW, 2015). The data for measures of technology adoption and use are illustrated in Figures 1 and 2. My initial analytic strategy was to regress the same relationship outcomes on each of these technology measures. To examine whether investment model variables *have* been changing before technology, I coded technology use as 0 in the years prior to the advent of social network technologies or mobile phones. However, before running the regression analyses I correlated the year of data collection with social media usage, and mobile phone ownership. The correlations were r = .946 and r = .894 respectively (see Figures 17 and 18 for scatterplots). The strong degree of linear association among these variables suggests that there is little to be gained by studying them separately and that, controlling for one when examining the others, may be ill advised.

I included these analyses nonetheless for the sake of completeness, running two additional sets of regressions. In the first set of regressions, I replaced the year of data collection with the social network use data, and used those data as my predictor for the relationship functioning variables. The results were similar to those reported previously for Year. The results were not statistically significant for satisfaction, investment, and commitment (B = −.004, p =.17; B = -.002, p = .55; B = -.002, p = .37. For quality of alternatives, however, the results were again statistically significant (B = .013, p = .002). In the second set of regressions, I replaced the year of data collection with the mobile phone use data, and used those data as my predictor for

the relationship functioning variables. The results were again similar to those reported previously for Year. The results were not statistically significant for satisfaction, investment, and commitment (B = −.01, p = .13; B = -.01, p = .19; B = -.002, p = .60). For quality of alternatives, however, the results were again statistically significant (B = .023, p = .008). Thus, without controlling for other society level trends (see auxiliary analyses in this chapter), it appears that technology use does predict a systematic rise in the perception of the quality of relationship alternatives over the last 18 years, from 1998 to the present day, but not in any other relationship functioning measure.

Auxiliary analyses

I conducted two more sets of regressions. In the first set of regressions, I controlled for three sample characteristics: (1) Clinical samples in which the sample included people who were clinically diagnosed with some form of psychological disorder (such as Bipolar disorder); (2) Samples in which participants were in a negative situation, for example adverse circumstances in which they were being abused or in a home with a violent partner; (3) Experiments, where relationship functioning may have been manipulated. Participants in these types of samples typically had more extreme ratings of their relationship functioning, thus I believed those samples may have biased the results. The results of these regressions did not show different patterns of results compared to the main analysis, and therefore they are not presented here, however they are included in Tables 2-5.

In the second set of regressions, I included the average divorce rate for each year as a predictor, in addition to the average age of marriage amongst men and women. After controlling for those variables, the pattern of the results changed, such that the year of data collection no longer statistically significantly predicted any of the relationship functioning variables, including

quality of alternatives (B = .55, p = .06). However, in a follow-up analysis the average age of marriage for men was statistically significantly associated with quality of alternatives (B = 1.5, p = .03.) The full results are included in Tables 6-9b.

Summary

The results from Study 1 revealed that relationship functioning has not changed over time, from the late 1990's to present day. People are just as satisfied, invested and committed to their relationships today, as they were two decades ago. In addition, although the year of data collection and technology use both predicted changes in people's perception of the quality of their alternatives, these associations did not hold when I included important covariates – divorce rates, and age of marriage. Specifically, men's average age of marriage statistically significantly predicted changes in the quality of alternatives, whereas women's average age of marriage and average divorce rates did not. Therefore, the data suggest that the perceived quality of alternatives have increased over time and as a function of technology use, though it is important to note that those two variables cannot be unconfounded in a meta-analytic review. However, it is possible that those changes are due to other society level trends, such as changes in the average age of marriage, specifically for men.

CHAPTER 3: STUDY 2A

Whereas Study 1 was designed to examine whether there is an association between relationship functioning and time, or technology adoption, in Study 2a I examined whether social media use covaries with relationship functioning in a contemporary sample. Using a correlational design, I examined the associations between people's technology use, in addition to "offline" activities or habits, and relationship functioning as defined by the Investment Model variables. I also included several individual difference measures, and relational interaction measures, to assess whether personality traits or the nature of people's interactions or perceptions of their interactions are related to romantic relationship functioning.

Method

Participants

Data were collected from 350 participants recruited from Amazon's Mechanical Turk. Participants were eligible if they were North American, and if they reported being in a long-term, committed romantic relationship. In addition, participants were screened based on the quality of their prior participation in other studies, such that they had to have a 90% approval rate. People who indicated they did not meet the basic criteria were redirected to a "thank you" page. I used several post-participation quality checks to assess the quality of the results and exclude participants who did not meet the my pre-determined quality standards. Specifically, three quality check questions were included in three of the five surveys participants filled out, in which participants were asked to select a particular response, or to leave a response empty. If participants failed to answer more than one of the quality checks correctly, they were excluded. In addition, participation was timed, and any participant who completed all surveys in under 5 minutes was removed from the final sample. I selected the five-minute limit because in initial

testing completing all the surveys took 20 minutes on average, hence I chose a highly

conservative five-minute limit. The final sample consisted of 270 participants, who were all

North American, self-identified as in a committed relationship, and who had not taken the survey

before.

In the final sample, participant mean age was 37.5 ($SD = .71$), and included 98 males

(36.3%) and 171 females (63.3%). Eighty-two percent of the sample were Caucasian, 6.7% were

African-American, 4.1% were Asian, and the rest identified as multiracial or "other." Mean

income was $49,000, and most participants grew up in families where both parents had at least

some college experience. On average, participants were in their relationships for 8.54 years, and

had had two prior long-term, committed relationships. Forty-nine percent of the sample

considered themselves in a long-term relationship, and 47.8% were married. Seventy-nine

percent of the participants were cohabiting with their partners.

Measures

Demographics. I measured several individual participant characteristics, including

gender, age, ethnicity, education level, socioeconomic status, religious and political views. I also

asked participants to report several details about their romantic relationship, such as relationship

status, relationship length, partner gender, and cohabitation status. The full set of items is

included in Appendix B.

Investment Model. Participants' relationship functioning was assessed with the

Investment Model Scale (IMS; Rusbult, et al., 1998), to assess relationship satisfaction,

investment, quality of alternatives, and commitment. Participants rated their agreement or

disagreement with each item on a nine-point scale. Example items for the satisfaction scale

include: "Our relationship makes me very happy" and "I feel satisfied with our relationship."

Example items for the investment scale include: "I have invested a great deal of time in our relationship" and "My relationships with friends and family members would be complicated if my partner and I were to break up (e.g., partner is friends with people I care about)." Example items for the quality of alternatives scale include: "My needs for companionship (doing things together, enjoying each other's company, etc.) could be fulfilled in alternative relationships" and "The people other than my partner with whom I might become involved are very appealing." Finally, examples for the commitment scale include "I am committed to maintaining my relationship with my partner" and "I would feel very upset if our relationship were to end in the near future." In the current study, Cronbach's alphas for the scales were .89 for satisfaction, .84 for investment, .84 for quality of alternatives, and .90 for commitment. The full scale is included in Appendix B.

Technology use. Participants' technology use was assessed using an adapted version of "The Facebook intensity scale" (Ellison, Steinfield, & Lampe, 2007). The scale was originally created to obtain a better measure of Facebook usage than frequency or duration indices. It includes two self-reported assessments of Facebook behavior, measuring the extent to which the participant was actively engaged in Facebook activities, network size and properties, and the amount of time spent on Facebook on a typical day. This measure also includes a series of Likert-scale attitudinal questions designed to tap the extent to which the participant is emotionally connected to Facebook and the extent to which Facebook is integrated into a person's daily activities. Original scale reliability was Cronbach's alpha = .83.

The modified version of this scale broadened its scope to include measurement of both online and offline activities, including social networks other than Facebook. In addition, subscales measured: (a) familiarity and frequency of use of social network and messaging apps

(b) social network information (e.g. size, connections with partner and others) (c) "offline" activities (d) measures of how rewarding each type of activity was. The full modified scale is included in Appendix B.

In terms of technology use, on average participants were on 3 social network platforms, spending 105 minutes a day using social media. Of the time spent using social media each day, participants reported spending 38% of the time interacting with their partners, and 42 percent of the time interacting with people other than their partners. Participants' average social network size was 540, and they were connected with their partners on an average of 1.74 platforms, compared to 2.15 platforms with people other than their partners.

Attachment security. Participants' attachment security was assessed using the 9-item partner-specific and 9-item global subscales from the ECR Relationship-Structures questionnaire (ECR-RS; Fraley, Heffernan, Vicary, & Brumbaugh, 2011). These subscales measure participants' attachment security specifically with respect to their current romantic partners, as well as their global attachment security across all close relationships, respectively. Each of these scales contains subscales to measure attachment anxiety (e.g., "I often worry that my romantic partner doesn't really care for me") and attachment avoidance (e.g., "I prefer not to show my romantic partner how I feel deep down"). Item responses were averaged, after appropriate reverse-scoring, to form composites for global-romantic, partner-specific, and global-close-others attachment anxiety and avoidance. In the current study, Cronbach's alpha for the scale was .87. The scales are included in Appendix B.

Personality traits. Participants completed the Ten Item Personality Inventory (TIPI; Gosling, Rentfrow, & Swann, 2003), a well-validated brief measure of personality. The TIPI includes two items per Big Five trait, and has been shown to be a psychometrically acceptable

and practically useful short measure of the Big Five factors of personality. The instructions for the TIPI are as follows: "Here are a number of personality traits that may or may not apply to you. Please write a number next to each statement to indicate the extent to which you agree or disagree with that statement. You should rate the extent to which the pair of traits applies to you, even if one characteristic applies more strongly than the other." Participants rate their agreement or disagreement with the items on a 7 point Likert scale. The full scale is included in Appendix B.

Loneliness. Participants completed the revised (version 3) UCLA Loneliness scale (UCLALS; Russel, 1996), a 20-item measure of loneliness. The instructions for the UCLALS are as follows: "The following statements describe how people sometimes feel. For each statement, please indicate how often you feel the way described by writing a number in the space provided." Participants can respond on a 4 point Likert scale from "1 – never" to "4 – always". Items include questions such as: "How often do you feel alone?", and "How often do you feel left out?" In the current study, Cronbach's alpha for the scale was .86. The full scale is included in Appendix B.

Responsiveness. Participants completed a custom, 3-item survey of perceived partner responsiveness that was based on previous work (Reis, Clark, & Holmes, 2004), for online and offline interactions. The instructions for the scale are as follows: "Please answer the following questions regarding your perceptions of your romantic partner when you interact online. Please select the appropriate response." Participants rate their agreement with the items on a scale from 1 – "strongly disagree" to 7 – "strongly agree." The three items are meant to measure care, understanding and appreciation from one's partner, the foundations of perceived partner responsiveness. Participants then answer the same questions in regards to their offline

interactions with their partners. Cronbach's alpha for the scale was .81. The full scale is included in Appendix B.

   Disclosure. Participants completed a custom, 3-item survey of disclosure that was based on previous work (Sprecher & Hendrick, 2004), for online and offline interactions. The instructions for the scale are as follows: "When you interact with your romantic partner online, how often do you disclose (talk about) the following things?" Participants rate the frequency in which they share their thoughts, emotions, and casual day-to-day topics on a scale from 1 – "never" to 5 – "always." Participants then answer the same questions in regards to their offline interactions with their partners. Cronbach's alpha for the scale was .82. The full scale is included in Appendix B.

Results

Preliminary data preparation

   Prior to conducting the data analyses, I computed several variables. I assessed participants' level of activity on social networks by creating three count variables. First, I created "Platforms" – a count variable of the number of social networks participants were on (e.g. Facebook, Twitter, Snapchat, Instagram), and messaging apps they use (e.g. Texting, Messenger, WhatsApp). I also created "Frequency of use" and "Frequency apps opened" – two variables to represent the frequency of technology usage. The first represents the number of minutes a person spends on social media in a typical day. The second represents the number of times a person opens social media applications on a typical day. On average, people in this sample spent 105 minutes ($SD = 99.69$) on social media each day. Most commonly they opened social media applications 5-9 a day. These two variables were correlated with each other ($r = .48$).

To quantify which mediums participants were using to interact with their partners and other people outside of their romantic relationship, I created four variables. First, "Percent of interactions with partner" and "Partner connectedness" – variables recording the percent of time participants spent interacting with their partner per day on social applications, of the overall time they spent on social applications, and the number of social networks a participant is connected on with his or her partner. I also created "Percent of interactions with other" and "Other connectedness" in the same way, but for interactions with people other than the participants' partners.

Finally, to assess the scope of participants' online social networks, I created the variable "Network size" – the total number of friends, followers, or contacts participants have across their social networks. However, I only collected aggregate level self-reported data on participants' social network sizes, and therefore I could not parse out which connections existed on multiple platforms, so I did not use this variable in the final analyses. Instead, I created "Largest network" – the number of connections a participant has on his or her largest social network, a proxy for network size in my analyses. Because the computed count and sum variables were all highly skewed, I transformed each of those variables using the natural log function. The transformed variables were used in all analyses reported below. The correlation table and descriptive statistics for the study variables are presented in Table 10.

I initially ran a factor analysis on all of the computed technology use variables, to examine whether there were underlying latent factors related to participants' technology use patterns. Five variables were included in the analysis (all described above): platforms, frequency of use, partner connectedness, other connectedness and network size. I used the principal axis factoring method with Varimax rotation to extract the factors, and came up with a two-factor

solution based on the scree plot. However, results showed that the second factor included two items (network size and frequency of use) that loaded onto both factors, and in addition it had very poor reliability (Cronbach's Alpha of .32). Therefore, I decided to analyze each technology use variable separately.

I examined the bivariate correlations between the Investment Model Scale constructs, technology use, individual difference measures, perceptions of partners in interactions, and specific behaviors in interactions such as disclosure. I first examined whether relationship functioning and technology use are associated. The only relationship functioning facet associated with technology use was the perception of the quality of alternatives, which was correlated with the number of platforms participants used ($r = .16, p < .01$). In other words, the more social media platforms a person used, the more likely he or she was to construe his or her alternatives as being of higher quality.

The Investment Model states that people's relationship functioning is tied to their experiences in past relationships, and several more recent studies have shown that Investment Model variables may be moderated by a range of individual differences (for example see Foster, 2008.) Therefore, I examined the correlations between relationship functioning and attachment insecurity, trait-level loneliness. Relationship satisfaction was most highly correlated with relationship specific attachment avoidance and anxiety ($r = -.64, r = -.47$), and loneliness ($r = -.46$). So were quality of alternatives ($r = .37, r = .22, r = .28$), investment ($r = -.52, r = -.19, r = -.19$), and relationship commitment ($r = -.49, r = -.18, r = -.25$). In other words, people's personality characteristics, and in particular their attachment insecurities and feelings of loneliness, were strongly associated with their relationship functioning. Higher levels of attachment insecurity, and loneliness, were associated with lower satisfaction, investment, and

commitment, and higher perceived quality of alternatives. This suggests that individual differences in attachment styles, Big Five personality characteristics, and trait level loneliness are more strongly associated with relationship functioning that when, which or how people use social technologies to communicate.

I also wanted to examine whether relationship functioning was associated with the way in which participants *perceived* their interactions with their partners, and the way in which they *disclosed* information. In addition, I aimed to contrast the importance of online and offline interactions. Relationship satisfaction and people's perceived quality of alternatives were highly correlated with participants' perceived partner responsiveness *offline*, disclosure *offline*, and how rewarding they felt *offline* interactions were ($r = .73$, $r = .48$, $r = .53$; $r = -.18$, $r = -.20$, $r = .12$.) Hence, relationship satisfaction and quality of alternatives were associated with people's experiences in their offline interactions, not those mediated by technology. Investment was most highly correlated with disclosure offline and online ($r = .25$, $r = .24$), and responsiveness offline ($r = .29$). Finally, relationship commitment was most highly correlated with participants' perceived partner responsiveness offline and online, and how rewarding offline interactions were ($r = .42$, $r = .29$, $r = .31$.) The correlations are presented in table 10.

I then ran two sets of multiple regressions, first regressing each of the four relationship functioning outcomes (i.e. relationship satisfaction, alternatives, investment, and commitment) on all the technology use variables, in order to estimate the extent to which people's use of social technologies predicts their relationship satisfaction, the perception of their alternatives, how invested, and how committed they are to their relationship. I also included relationship length as a covariate, to control for how long participants had been with their partners at the time.

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The regression results are reported in in Tables 11-14. None of the technology use variables predicted how satisfied people were in their relationships. Quality of alternatives was associated with the number of platforms participants were on, which also predicted less investment in the relationship. Finally, none of the variables measured predicted variation in commitment.

Although the previous analyses revealed that some of the technology use variables are associated with relationship functioning, it could be the case that this is an artifact of how rewarding people find their interactions with partners, how responsive they perceive their partners to be, how much they disclose to their partners, or certain personality characteristics that are highly related to romantic relationships such as loneliness, or attachment insecurity. To evaluate these possibilities, I ran the analyses again, but controlling for individual difference measures, and the measures for how participants perceived their interactions with their partners, and the way in which they disclosed information this time. The full results are summarized in Tables 15-18.

Relationship satisfaction was positively associated with how rewarding people considered their interactions, their perceived partner responsiveness in offline interactions, and general anxiety. Conversely, loneliness and relationship specific attachment avoidance both predicted lower relationship satisfaction.

Quality of alternatives was positively associated with relationship specific attachment avoidance, and interestingly perceived partner responsiveness in offline interactions. Loneliness, extraversion, and emotional stability also predicted higher perceived quality of alternatives. Conversely, general attachment avoidance predicted lower perceived quality of alternatives.

Investment was positively associated with the size of people's online social network, how disclosure online, and general attachment anxiety. Conversely, relationship specific attachment avoidance predicted less investment.

Finally, relationship commitment was positively associated with perceived partner responsiveness in offline interactions, emotional stability, relationship specific attachment anxiety, and general attachment anxiety. Conversely, relationship specific attachment avoidance predicted lower levels of commitment.

As can be seen, satisfaction, quality of alternatives and commitment were not related to technology use after accounting for individual differences in attachment, Big Five personality, loneliness, perceived partner responsiveness, and disclosure. This suggests that relationship functioning is mostly influenced by people's relational histories, their personalities, and the way they experience interactions with their partners, rather than by the medium in which those interactions are held. However, the pattern of results for relationship investment did suggest that people who are more active online, are also less invested offline. In other words, people who are more active on social networks, are also less invested in their own romantic relationship.

Summary

The results from Study 2a are consistent with the results from Study 1, in that technology use appears to be mostly unassociated to relationship functioning. In Study 2a, I examined this potential association in a contemporary sample of technology using adults who are in committed romantic relationships. Although some of the analyses revealed statistically significant associations between technology use and relationship functioning, those results were not robust across alternative ways of analyzing the data, when I included attachment, personality, and other variables as predictors.

Interestingly, although they were small in magnitude, the correlations between the *number of social network platforms* participants used, and their relationship functioning were mostly in the opposite direction from the correlations between *participants' network size* and their relationship functioning. The "platforms" measure was negatively correlated with satisfaction, investment and commitment ($r = -.08, -.10, -.01$ respectively), whereas network size was positively correlated with those same variables ($r = .05, 07, .08$ respectively). Broadly speaking, the number of social networks a person uses and the size of those networks are both measures of online social activity, or social network size. Why then the contrasting correlations? One possibility is that it is the *number* of social networks a person uses that interferes with romantic relationship functioning, rather than the *size* of *each* network. In this sample, people found offline interactions with their partners more rewarding on average, and valued partner responsiveness and the opportunity to disclose information to partners at a higher level in offline interactions. Being on social networks can be time consuming, and it is reasonable to assume that the more social networks a person is a member of, the less time that person will have to dedicate to their romantic partner in the offline realm. Hence, the more platforms people are on, the less satisfied and invested they are in their relationship, and in turn less committed. Conversely, network size was positively correlated with relationship functioning variables, though only weakly so. Perhaps the size of people's online social networks simply does not influence their daily lives much, and specifically their relationships with their romantic partners. In addition, it may be the case that people in romantic relationships actually feel more comfortable in their own relationship, knowing that they have the support of a broad network of family and friends. Maybe having the opportunity to share one's relationship with a wider network and receive positive, encouraging feedback strengthens one's romantic relationship. Finally, perhaps being

exposed to other people's relationships often leads a person to think: "well, how lucky am I?" This matter will have to be researched further, however it is clear that there are important nuances in the way researchers measure and evaluate characteristics of people's online lives, and their association with "offline" outcomes.

The data suggest that people's relationship functioning is mostly associated with how they experience their daily interactions, the "offline" ones more so than the online ones. In addition, it appears that people's attachment insecurities and personality are also associated with variation in relationship functioning, rather than how many social apps they use, how often they interact with their partners online, or the size of their online social networks. These data certainly do not support the idea that technology has revolutionized people's relationships, not from an Investment Model perspective. These data are more consistent with the notion that there are fundamental personality level characteristics, and interaction level characteristics that influence people's relationship functioning, independently from where those interactions are held, or in other words through which medium.

CHAPTER 4: STUDY 2B

In Study 2a I examined whether technology use covaries with relationship functioning in a contemporary sample obtained through Amazon Mechanical Turk. However, I also wanted to examine this question in a younger sample, who are more frequent users of technology, and who are also probably at an earlier stage of their relationship. I also aimed to replicate my findings from Study 2a, using precisely the same measures, and a sample of individuals who are currently in romantic relationships.

Method

Participants

Data were collected from 300 participants recruited from the psychology department credit subject pool. Participants were eligible if they were over 18, and if they reported being in a romantic relationship. People who indicated they did not meet the basic criteria were redirected to a "thank you" page. I used several post-participation quality checks to assess the quality of the results and filter out low-quality data. Specifically, three quality check questions were included in three of the five surveys. In addition, participation was timed, and any participant who completed all surveys in under five minutes was removed from the final sample. The final sample consisted of 245 participants, who were all over 18, self-identified as in a committed relationship, and who had not taken the survey before.

In the final sample, the mean age was 19.71 (SD = .07), and included 84 males (34.3%) and 160 females (65.3%). Fifty-eight percent of the sample were Caucasian, 20% were Asian, and 13.9% identified as multiracial or "other." Mean income in this sample was $51,500, and most participants grew up in families where both parents had at least some college experience, most commonly a bachelor's or graduate degree. On average, participants were in their

relationships for 1.48 years, and had had one other prior long-term, committed relationship. Thirty-two percent of the sample considered themselves as dating, 66.9% considered their relationship to be a long-term relationship, and .8% were married. Approximately nine percent of the participants were cohabiting with their partners.

Measures

All measures in Study 2b were identical to the measures used in Study 2a. See Appendix B for the full verbatim study materials. The correlation table and descriptive statistics for the study variables are presented in Table 19.

Results

I compared the technology use characteristics of this sample with the mTurk one before I began my analyses. On average participants were on 5 social network platforms, spending 162 minutes a day using social media. Of the time spent using social media each day, participants reported spending 49% of the time interacting with their partners, and 40 percent of the time interacting with people other than their partners. Participants' average social network size was 1,451, and they were connected with their partners on an average of 3.2 platforms, compared to 3.4 platforms with people other than their partners. Thus, in this sample of undergraduates, people used more social networks on a regular basis, and they were substantially more active on social media compared to the older sample collected from mTurk. However, they spent about the same percentage of their time communicating with their partners online, as in the mTurk sample.

As in Study 2a, the key question I sought to answer was whether social media use patterns are associated with relationship functioning in a contemporary sample. More specifically, my goals were to examine the associations between people's technology use and relationship functioning, as defined by the Investment Model variables. I also wanted to account

for people's "offline" activities or habits, individual differences such as attachment insecurities, and the nature of people's interactions, such as the amount of information they disclose in a typical interaction. Together, I hoped to assess whether technology use may account for variation in relationship functioning, above and beyond well-established predictors of relationship satisfaction, investment, perceived quality of alternatives and commitment.

First, I examined the bivariate correlations between the Investment Model Scale constructs, technology use, individual difference measures, and the perceptions of, and behaviors in interactions. Unlike in the mTurk sample, none of the relationship functioning and technology use variables were statistically significantly correlated (see Table 19).

Once again, I began by examining whether relationship functioning and technology use were associated, and they were not. I then examined the correlations between relationship functioning and the individual difference measures included in this study, to establish whether individual characteristics may be more strongly associated with relationship functioning than people's technology use patterns. The correlations were mostly similar to the mTurk sample, such that relationship satisfaction, quality of alternatives, and investment were all most highly correlated with attachment avoidance and anxiety ($r = -.63$, $r = -.42$; $r = .35$, $r = .24$; $r = -.49$, $r = -.16$). However, the perception of quality of alternatives, and investment were not correlated with loneliness, unlike in the mTurk sample ($r = .07$; $r = -.01$). Finally, relationship commitment was most highly correlated with relationship specific attachment avoidance ($r = -.41$), and loneliness ($r = -.15$), but not with relationship specific attachment anxiety as was the case with the mTurk sample. In other words, people's attachment insecurities were strongly associated with their relationship functioning, such that higher levels of attachment insecurity (and loneliness in some cases), were associated with lower satisfaction, investment, and commitment, and higher

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perceived quality of alternatives. Similar to the results from Study 2a, this suggests that individual differences in attachment styles, and trait level loneliness are more strongly associated with relationship functioning that when, which or how people use social technologies to communicate.

I also returned to the question of how relationship functioning may be associated with the way in which participants perceived their interactions with their partners, and the way in which they disclosed information. This was also to contrast the relative importance of online and offline interactions, comparing their associations with relationship functioning. All correlations are presented in Table 19. Relationship satisfaction was most highly correlated with participants' perceived partner responsiveness offline and online, and how rewarding they felt their online interactions were ($r = .47$, $r = .51$, $r = .37$.) For reference, in the mTurk sample higher correlations were found between disclosure *offline*, and how rewarding *offline* interactions were perceived to be. Quality of alternatives was also most highly correlated with participants' perceived partner responsiveness offline and online, and disclosure offline and online, but not how rewarding they felt offline interactions were, unlike in the mTurk sample ($r = -.19$, $r = -.19$, $r = -.23$, $r = -.22$). Investment was most highly correlated with disclosure offline and online ($r = .34$, $r = .44$), and how rewarding interactions with the partner were rated ($r = .21$). Finally, relationship commitment was most highly correlated with participants' perceived partner responsiveness offline and online, and how rewarding online interactions were ($r = .27$, $r = .28$, $r = .30$.), as opposed to offline interactions in the mTurk sample.

I then ran two identical sets of multiple regressions to the first sample, first regressing each of the four relationship functioning outcomes on all the technology use variables, including

relationship length as a covariate, to control for how long participants had been with their partners at the time.

The regression results are reported in in Tables 20-23. None of the technology use variables predicted how satisfied people were in their relationships. Quality of alternatives was not associated with the number of platforms participants were on, unlike in the mTurk sample. Relationship investment was positively associated with social network size, a curious finding when compared to the mTurk sample where social network activity predicted less investment in participants' relationships. Finally, none of the technology use variables predicted changes in commitment.

Following the first set of regression analyses I added the individual difference measures, and the measures for how participants perceived their interactions with their partners, and the way in which they disclosed information. The motivation was the same as in Study 2a: although the previous analyses revealed that some of the technology use variables are associated with relationship functioning, it could be the case that this is an artifact of how people experience their interactions with their partners, or certain personality characteristics that are highly related to romantic relationships such as loneliness, or attachment insecurity. To evaluate these possibilities, I ran the analyses again, but this time controlling for individual difference measures, and the measures for how participants perceived their interactions with their partners, and the way in which they disclosed information this time. The full results are summarized in Tables 24-27.

Relationship satisfaction was positively associated with how rewarding online interactions with partners were rated, perceived partner responsiveness in online interactions, disclosure offline and general attachment avoidance. These were somewhat different findings to

the mTurk sample, where offline activities were more related to satisfaction. Conversely, rewarding interactions with others, disclosure online, loneliness, emotional stability and relationship specific attachment avoidance and anxiety all predicted lower relationship satisfaction. This again was quite different from the mTurk sample, where the interactions with others, disclosure and personality characteristics did not predict lower satisfaction.

Quality of alternatives was positively associated with relationship specific attachment avoidance, and network size. This was not the case in the mTurk sample, where network size did not predict variation in the perceived quality of alternatives. In addition, in this sample loneliness and other personality characteristics did not predict variation in perceived quality of alternatives.

Investment was positively associated with how rewarding interactions with partners were, and disclosure offline. In the mTurk sample, the size of people's online social network, how much participants disclose online, and general attachment anxiety all predicted higher investment, not so in this sample. Relationship specific attachment avoidance predicted less investment, similarly to the mTurk sample.

Finally, commitment was positively associated with how rewarding partner interactions were perceived to be, and relationship specific anxiety. This is quite different than in the mTurk sample, where perceived partner responsiveness in offline interactions, emotional stability, relationship specific attachment anxiety, and general attachment anxiety predicted higher levels of relationship commitment. How rewarding interactions with others were perceived to be, loneliness, extraversion, and relationship specific attachment avoidance all predicted lower levels of commitment. In the mTurk sample, only relationship specific attachment avoidance predicted lower levels of commitment. The full results for these analyses are presented in Tables 24-27.

Summary

The results from Study 2b differ from Study 2a, such that, technology use is comparatively more associated to relationship functioning. In Study 2a, I examined this potential association in a contemporary sample of technology using adults who are in committed romantic relationships. In this study I attempted to replicate the findings with a younger sample of undergrads, who are typically in earlier stage relationships, and who use technology more frequently on a daily basis. The results were not consistent with the findings from the mTurk sample. For example, my findings indicated that relationship satisfaction in particular was associated with people's online interactions, and how they perceive them. However, all other facets of relationship functioning were more strongly associated with individual differences such as attachment insecurities, rather than technology use. Complementing my previous findings, these data do not support the idea that technology has revolutionized people's relationships, at least not from an Investment Model perspective. These data are again more consistent with the notion that there are fundamental personality level characteristics, and interaction level characteristics that influence people's relationship functioning, independently from where those interactions are held.

CHAPTER 5: GENERAL DISCUSSION

Overview

According to some accounts (Masuda, 1985), there have been three major social revolutions in humankind's history. The first revolution occurred around 10,000 BC, when people transitioned from a diet based in vegetables, fruit, nuts and meats, to a diet of cultivated foods supported by agricultural technologies. The outcomes of the agricultural revolution were profound. Agriculture provided humans with new means of producing food and other materials, by exploiting the land and its natural resources. The result was a burgeoning of stable settlements and land improvement, an exponential increase in population densities, and the development of cities and modern civilization (Masuda, 1985). In the mid-1800's, the second revolution - the industrial revolution, lead to a transition from producing tools and goods by hand, to the use of modern machinery. In turn, humans were able to harness the practically unlimited potential of artificial mechanical systems, to grow industries such as the textile industry, mining, chemicals, building and more to a scale never imagined before. The results were profound, as standards of living rose, the population increased dramatically, labor conditions were transformed, and the global economies soared to unprecedented heights (Hudson, 2014).

The third revolution may be the most transformative revolution in humankind's history – the technological revolution. Beginning in the mid-20th century, digital technologies such as the personal computer, the mobile phone, and the internet have brought along sweeping changes in how people lead their day by day lives. Human society has begun to benefit from an unprecedented access to information, computing power, and the promise that technology holds for fields ranging from healthcare, to education, and transportation. In my realm of interest, close relationships, technology has created more interconnectedness and communication possibilities

than ever before in the history of humankind. Nonetheless, the effects of the technological revolution on close relationships and relationship functioning are still mostly unclear (Brock, 2009)

Therefore, I embarked on this research to test two sets of alternative predictions about relationship functioning across time. First, a growing body of research has indicated that changes are happening in relationship functioning processes (Papp, Danielewicz, & Cayemberg, 2012; Rhoades, Stanley, & Markman, 2012). However, it is unclear whether relationship commitment and its predictors have changed over time, and if so, in which direction. Second, some studies propose that technology has afforded individuals the opportunity to grow closer to their partners, communicate more, and express themselves in more authentic ways (Papp, Danielewicz, & Cayemberg, 2012). Conversely, other studies have highlighted the negative consequences of technology on relationships, primarily due to shifts in social network use and their effects on jealousy, spying, infidelity and other negative outcomes (Fox et al., 2014; Marshall, Bejanyan, Castro, & Lee, 2013; Elphinston & Noller, 2011). My goal was therefore to illuminate these long-standing questions pertaining to the role technology plays in relationship functioning.

The present research was structured around the investment model framework, one of the most influential relationship functioning models in the close relationships literature. The model details the key mechanisms underlying persistence in a relationship: commitment, and its predictors – relationship satisfaction, the perceived quality of the alternatives to the relationship, and investment in the relationship (Rusbult, 1983; Rusbult & Buunk, 1993). According to the investment model (Rusbult, 1980), people are most likely to feel committed to their relationships when they are satisfied, invested, and have few alternatives. I chose to focus on the investment model because it provides a powerful tool for understanding relationship functioning, as it

parsimoniously unpacks the distinct components predicting commitment, and explains how each one contributes to relationship processes. The investment model thus captures some of the most central components of relationship functioning.

The primary finding from the meta-analysis I conducted was that, over the span of two decades, only the perceived quality of alternatives has changed over time. People today see more high quality alternatives than they did twenty years ago. It is unclear whether this is due to advancements in technology, and the data suggest that other explanations such as men's age of marriage are more relevant. In addition, relationship satisfaction, investment in the relationship, and commitment have not changed from the late 1990's to the present. When one considers the variety of ways in which technology has impacted people's life, surely one of the major impacts has been the sheer amount of information people are able to search through, the scope of people's online social networks, and the visibility of other people's lives. Moreover, to some extent people tend to share what they consider to be the best, most positive aspects of their lives on social networks (Mehdizadeh, 2010). Therefore, it is possible that part of the reason people's perceived quality of alternatives is changing in a positive direction may be that people are exposed to more information about potential mates, and in turn that information may be skewed towards the more positive aspects of those mates' physical appearance, personality, and character.

Why, however, has relationship functioning not changed with the growing use of mobile and social technologies? I can suggest two possible reasons based on the findings from the online samples I collected. First, it appears that people's relatively stable individual characteristics, such as their relationship specific attachment styles, explain more of the variance in relationship functioning than the ways in which they use technology. If someone is avoidantly attached, they

will avoid intimacy and closeness whether it is in the offline or the online realms. If someone is lonely, the size of their online social network or how often they view it will not change how they feel about their partner. Second, it appears that the way in which people experience their interactions is much more important than the medium in which the interactions are held. In other words, people desire rewarding interactions with their partners, and a partner who will be responsive, caring and understanding to them. Based on my findings, people are more concerned with those aspects as they assess the functioning of their relationship, rather than how many online platforms they are connected with their partner on, or the medium through which they interact.

Limitations and future directions

First, my choice to limit the scope of the meta-analysis to studies that used the investment model scale (Rusbult, 1998) had several consequences. The IMS was published in 1998, therefore my meta-analysis does not include papers from prior to 1998. This may not be particularly consequential given that technologies such as social networks and smart mobile devices did not emerge until the early 2000's, however for a broader scope of the association between technologies and relationship functioning, researchers should examine earlier studies. In addition, limiting the scope of the study to the IMS meant I did not include the plethora of studies related to relationship satisfaction and other relationship functioning variables that used other measures. As an example, there are at least seven common measures of satisfaction, including the Quality of Marriage Index (Norton, 1983), the Relationship Assessment Scale (Hendrick, 1998), and the Couples Satisfaction Index (Funk & Rogge, 2007). Including studies using such scales would introduce certain measurement and scaling issues, however it would also have substantially increased the size of my meta-analytic database.

Second, in the online samples I collected, I relied on self-report to determine factors such as participants' social network size, their technology usage patterns and the nature of their online interaction with their partners and others. This is not the optimal method to collect such information, as it potentially introduces a certain degree of bias and unreliability. A more preferable method would be to directly access the basic information of people's social networks and mobile activity.

Third, the average age in the samples I used for this research was between twenty to thirty years old. Therefore, I cannot make any claims regarding the association between relationship and technology use amongst adults in their 40's or later. This may be an important association to examine, because older adults may find online social communication less rewarding than more traditional methods of communication, or conversely they may find novel ways of communication even more rewarding than digital natives who were born into these technologies. Given that my findings show that it is not necessarily the medium one uses to communicate that is important for relationship functioning, but instead how rewarding those interactions are, older samples may provide us with additional insights regarding the association between relationship functioning and technology. However, it is unclear whether older adults find online interactions to be necessarily less rewarding. Perhaps the novelty and "magical" qualities of emerging technologies actually create a more rewarding experience for older adults as well, and measuring that experience and its association with relationship functioning could be beneficial. Ideally, future research on relationship functioning and technology use would include diverse samples of people from several generations, from participants in their teens, to retirees. In such a study, accounting for age at the data analysis stage would further researchers'

understanding of the potentially differential effects of technology use on relationship functioning among various age groups.

Fourth, I did not consider some of the alternatives to the associations between broad societal trends and technology use. As an example, it is possible that rather than viewing divorce rates as a *predictor* of relationship functioning, one could consider that possibility that time and changes in technology use may be associated with divorce, such that divorce is the *outcome*. In other words, given that technology use patterns have changed over time, perhaps certain aspects of social media use are tied to divorce, such as the comfort in one's ability to communicate with his or her partner at any time, or conversely the jealousy that potentially arises when someone realizes their romantic partner is connected to several attractive potentially mates.

Finally, relationship research scholars have a tendency to focus on one type of relationship, mostly romantic ones. However, the associations between the use of novel technologies and relationship functioning are clearly not limited to just romantic relationships. Friendships may function better when friends can communicate from afar, share their experiences, and keep up with each other even when they cannot spend time together in person.

Conclusion

In 1964, the renowned communications scholar Marshall McLuhan coined the term "The medium is the message" (McLuhan, 1964). In McLuhan's view, the medium was of much greater importance than the message it carried, and should therefore always be the focal point of researchers. However, in the context of my dissertation research, it would be fair to say that the medium was "not the message" at all. Though I assumed that interactions via relatively new social technologies would have a substantial impact on people's relationship functioning, my findings suggest that people still care a lot more about the fundamentals of healthy

communication, independently of the medium. People are interested in rewarding interactions, and typically offline interactions are still rated as more rewarding. They are interested in partners who are responsive, in that they are understanding, and caring. People have a need to disclose information to their partners, regardless of how that happens. Finally, if people feel insecure or lonely, the association with relationship functioning will be much stronger than the association with an action such as joining another social app, or expanding one's online social network.

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APPENDIX A - TABLES AND FIGURES

Table 1.

Sample Coding Sheet

Study Name And Authors	Publication source	Country of study	Database name	Publication year	Data collection year	Location
N	Dyadic Y/N	Paid Y/N	Sample type	M age	Females	Males
Avg relationship duration	Ethnicity	Relationship type	Who's rating	Hetero/Homo	Method	Experimental Y/N

Clinical Y/N	Negative Y/N	Comments	IMS M,SD,Reliability	Social network	Mobile	Divorce rates	Marriage age men	Marriage age women

Table 2.

Meta-regression of Commitment on Year, controlling for clinical, negative, and experimental samples (Study 1)

	B	SE	Z	*p*	ci.l	ci.u
Intercept	31.91	34.84	.91	.36	-36.37	.100.206
Year	-.01	.01	-.72	.46	-.04	.02
Experimental	-.09	.23	-.41	.67	-.54	.35
Clinical	-.29	.36	-.82	.41	-1.00	.41
Negative	-.57	.20	-.284	.005*	-.97	-.17

Table 3.

Meta-regression of Satisfaction on Year, controlling for clinical, negative, and experimental samples (Study 1)

	B	SE	Z	*p*	ci.l	ci.u
Intercept	63.44	43.62	1.45	.14	-22.05	148.94
Year	-.02	.02	-1.30	.19	-.07	.01
Experimental	.48	.34	1.41	.15	-.18	1.15
Clinical	-.88	.40	-2.20	.02*	-1.67	-.10
Negative	-.54	.22	-2.47	.01*	-.97	.11

Table 4.

Meta-regression of Investment on Year, controlling for clinical, negative, and experimental samples (Study 1)

	B	SE	Z	*p*	ci.l	ci.u
Intercept	57.59	54.97	1.04	.29	-50.14	165.33
Year	-.02	.02	-.94	.34	-.07	.02
Experimental	.36	.40	.91	.36	-.42	1.16
Clinical	-.39	.96	-.41	.68	-2.28	1.48
Negative	-.79	.29	-2.67	.008*	-1.37	-.21

Table 5.

Meta-regression of Quality of Alternatives on Year, controlling for clinical, negative, and experimental samples (Study 1)

	B	SE	Z	*p*	ci.l	ci.u
Intercept	-176.99	65.08	-2.72	.007*	-304.55	-49.43
Year	.09	.03	2.77	.006*	.02	.15
Experimental	.39	.56	.69	.48	-.71	1.50
Clinical	.28	1.08	.26	.79	-1.84	2.40
Negative	.38	.36	1.04	.29	-.33	1.09

Table 6.

Meta-regression of Commitment on Year, controlling for divorce rates and age of marriage (Study 1)

	B	SE	Z	*p*	ci.l	ci.u
Intercept	-384.91	236.55	-1.62	.10	-848.54	78.71
Year	.19	.12	1.59	.11	-.04	.44
Divorce	.22	.13	1.71	.08	-.03	.48
Male marriage age	-.66	.56	-1.16	.24	-1.77	.44
Female marriage age	.17	.63	.27	.78	-1.06	1.41

Table 7.

Meta-regression of Satisfaction on Year, controlling for divorce rates and age of marriage (Study 1)

	B	SE	Z	*p*	ci.l	ci.u
Intercept	-652.03	331.61	-1.96	.04*	-1301.97	-2.08
Year	.33	.17	1.95	.05	-.001	.68
Divorce	.35	.16	2.15	.03*	.03	.67
Male marriage age	-1.34	.85	-1.57	.11	-3.02	.32
Female marriage age	.09	.73	.12	.89	-1.33	1.52

Table 8.

Meta-regression of Investment on Year, controlling for divorce rates and age of marriage (Study 1)

	B	SE	Z	*p*	ci.l	ci.u
Intercept	-498.92	447.66	-1.11	.26	-1376.32	378.48
Year	.24	.23	1.04	.29	-.21	.70
Divorce	.38	.24	1.60	.10	-.08	.85
Male marriage age	-1.46	1.25	-1.16	.24	-3.93	1.00
Female marriage age	1.64	.99	1.64	.09	-.30	3.59

Table 9a.

Meta-regression of Quality of Alternatives on Year, controlling for divorce rates and age of marriage (Study 1)

	B	SE	Z	*p*	ci.l	ci.u
Intercept	-1067.22	565.77	-1.88	.05	-2176.12	41.68
Year	.55	.29	1.88	.06	-.02	1.14
Divorce	.33	.28	1.20	.23	.21	.89
Male marriage age	-1.18	1.58	-.74	.45	-4.28	1.91
Female marriage age	-1.12	1.27	-.88	.37	-3.62	1.37

Table 9b.

Meta-regression of Quality of Alternatives on divorce rates and age of marriage (Study 1)

	B	SE	Z	*p*	ci.l	ci.u
Intercept	-4.57	28.71	-0.15	.87	-60.85	51.69
Divorce	-0.06	.18	-.36	.71	-.43	.29
Male marriage age	1.50	.69	2.17	.03*	.149	2.86
Female marriage age	-1.20	1.31	-.92	.35	-3.77	1.36

Table 10.

Correlations and Descriptive Statistics for Study Variables (Study 2a)

	Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
1	SAT	1	-.30*	.41*	.58*	-.08	.01	-.038	.052	.031	-.05	.16*	.44*	.73*	.31*	.48*	.29*	.020	.53*	.14*	-.64*	-.47*	-.086	-.20*	.079	.075	.23*	.16*	.11	-.46*
2	QOA	-.30*	1	-.30*	-.15*	.16*	.04	.116	.055	.089	.07	-.18*	-.099	-.18*	.000	-.20*	.010	.019	-.18*	.12*	.37*	.22*	-.050	.12*	.075	-.075	-.151*	.01	.10	.28*
3	INV	.41*	-.30*	1	.50*	-.10	.01	-.027	.072	.008	-.03	.033	.19*	.29*	.24*	.25*	.065	.105	.151*	-.041	-.52*	-.19*	-.18*	.000	.024	.090	.153*	-.00	.03	-.19*
4	COM	.58*	-.15*	.50*	1	-.01	.08	.001	.084	.041	-.00	.12*	.29*	.42*	.20*	.26*	.18*	.084	.31*	.032	-.49*	-.18*	-.102	.012	.030	.076	.111	.10	.03	-.25*
5	PLT	-.08	.16*	-.10	-.01	1	.24*	.37*	.32*	.50*	.61*	-.00	-.031	-.011	.013	-.00	.110	.065	.037	.050	.10	.081	.097	.091	.035	-.072	-.136*	-.06	.06	.06
6	FRQ	.01	.04	.01	.08	.24*	1	.46*	.28*	.15*	.20*	.17*	.115	.051	.128*	.08	.24*	-.004	.015	-.13*	-.059	.053	.019	.084	-.038	-.030	-.042	-.115	.02	.07
7	FRQ2	-.03	.11	-.02	.00	.37*	.46*	1	.21*	.32*	.24*	.11	.030	-.00	.11	.02	.18*	.048	-.00	-.11	.043	.128*	-.002	.156*	.028	-.14*	-.12*	-.14*	.00	.06
8	NWS	.05	.05	.07	.08	.32*	.28*	.21*	1	.21*	.23*	.10	-.020	.08	-.03	-.03	-.017	.17*	.10	.13*	.011	.033	.034	.047	.098	-.080	-.07	-.02	.031	-.00
9	PCO	.03	.08	.00	.04	.50*	.15*	.32*	.21*	1	.50*	.12*	.135*	.05	.10	.06	.25*	.115	.04	.06	-.013	.011	-.041	.079	.021	-.064	-.13*	-.03	.02	.06
10	OCO	-.05	.07	-.03	-.00	.61*	.20*	.24*	.23*	.50*	1	.01	-.055	-.01	-.01	.05	.059	.18*	-.04	.06	-.014	.052	-.001	.072	.067	-.012	-.07	-.01	.08	-.01
11	OFRQ	.16*	-.18*	.03	.12*	-.00	.17*	.112	.103	.12*	.01	1	.068	.09	.08	.09	.18*	-.015	.15*	.04	-.092	.005	-.045	.027	.062	-.059	-.04	.00	-.01	-.16*
12	RSO	.44*	-.09	.19*	.29*	-.03	.11	.030	-.020	.13*	-.05	.06	1	.49*	.47*	.30*	.46*	-.027	.28*	.06	-.40*	-.32*	-.088	-.050	.018	.097	.02	.07	.08	-.22*
13	RSOF	.73*	-.18*	.29*	.42*	-.01	.05	-.008	.080	.055	-.01	.09	.49*	1	.24*	.56*	.20*	-.037	.53*	.20*	-.60*	-.46*	-.063	-.22*	.061	.064	.23*	.107	.15*	-.41*
14	DSO	.31*	.00	.24*	.20*	.01	.12*	.110	-.031	.10	-.01	.08	.47*	.24*	1	.39*	.33*	.006	.15*	.01	-.34*	-.12*	-.154*	-.025	-.082	.065	.047	-.00	.087	-.08
15	DSOF	.48*	-.20*	.25*	.26*	-.00	.08	.022	-.036	.06	.05	.09	.30*	.56*	.39*	1	.18*	-.026	.34*	.03	-.52*	-.26*	-.115	-.18*	.097	.127*	.17*	.04	.23*	-.30*
16	RPO	.29*	.01	.06	.18*	.11	.24*	.18*	-.017	.25*	.05	.18*	.46*	.20*	.33*	.18*	1	.24*	.23*	.12*	-.14*	-.09	-.073	-.021	-.045	.112	-.027	.06	.026	-.06
17	ROO	.02	.01	.10	.08	.06	-.00	.048	.17*	.11	.18*	-.01	-.027	-.037	.006	-.026	.24*	1	.06	.29*	-.039	.00	-.20*	-.110	.064	.191*	-.030	.02	.102	-.14*
18	RPOF	.53*	-.18*	.15*	.31*	.03	.01	-.004	.10	.044	-.04	.15*	.28*	.53*	.15*	.34*	.23*	.06	1	.33*	-.38*	-.20*	.008	-.17*	.020	-.016	.120*	.06	.08	-.30*
19	ROOF	.14*	.12*	-.04	.03	.05	-.13*	-.110	.13*	.061	.06	.04	.067	.20*	.018	.034	.123*	.29*	.33*	1	-.05	-.11	-.135*	-.140*	.132*	.101	.088	.18*	.14*	-.20*
20	RAAV	-.64*	.37*	-.52*	-.49*	.10	-.05	.043	.01	-.013	-.01	-.092	-.40*	-.60*	-.34*	-.52*	-.14*	-.03	-.38*	-.052	1	.53*	.26*	.30*	-.10	-.19*	-.23*	-.06	-.10	.44*
21	RAAX	-.47*	.22*	-.19*	-.18*	.08	.053	.128*	.033	.011	.05	.005	-.32*	-.46*	-.12*	-.26*	-.096	.003	-.20*	-.116	.53*	1	.119	.52*	-.096	-.22*	-.28*	-.31*	-.03	.52*
22	GAAV	-.08	-.05	-.18*	-.10	.09	.019	-.002	.034	-.041	-.00	-.045	-.088	-.063	-.15*	-.115	-.073	-.20*	.008	-.135*	.26*	.119	1	.16*	-.198*	-.20*	.005	.01	-.09	.34*

Table 10 (cont.)

	Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
23	GAAX	-.20*	.12*	.000	.01	.09	.084	.156*	.047	.079	.072	.027	-.050	-.22*	-.025	-.18*	-.021	-.110	-.17*	-.140*	.30*	.52*	.16*	1	-.17*	-.33*	-.28*	-.42*	-.06	.54*
24	EXT	.07	.07	.02	.03	.03	-.038	.028	.098	.021	.067	.062	.018	.061	-.082	.097	-.045	.064	.020	.132*	-.102	-.096	-.19*	-.17*	1	.120*	.149*	.26*	.36*	-.40*
25	AGR	.075	-.07	.09	.076	-.07	-.030	-.14*	-.080	-.064	-.012	-.059	.097	.064	.065	.127*	.112	.19*	-.016	.101	-.19*	-.22*	-.20*	-.33*	.120*	1	.27*	.40*	.21*	-.29*
26	CON	.23*	-.15*	.15*	.111	-.13*	-.042	-.12*	-.077	-.133*	-.079	-.043	.029	.23*	.047	.17*	-.027	-.030	.120*	.088	-.23*	-.28*	.005	-.28*	.149*	.27*	1	.44*	.14*	-.31*
27	EST	.16*	.018	-.00	.106	-.06	-.115	-.14*	-.020	-.037	-.015	.000	.075	.107	-.004	.040	.065	.024	.065	.18*	-.061	-.31*	.019	-.42*	.26*	.40*	.44*	1	.15*	-.40*
28	OPN	.119	.102	.03	.032	.06	.027	.00	.031	.028	.087	-.019	.089	.15*	.087	.23*	.026	.102	.089	.141*	-.106	-.035	-.096	-.065	.36*	.21*	.142*	.15*	1	-.20*
29	LON	-.46*	.28*	-.19*	-.25*	.06	.075	.06	-.006	.063	-.016	-.16*	-.22*	-.41*	-.083	-.30*	-.069	-.141*	-.30*	-.20*	.44*	.52*	.34*	.54*	-.40*	-.29*	-.31*	-.40*	-.20*	1
	M	7.45	3.87	7.37	6.56	1.02	4.21	1.03	5.16	.41	.59	4.51	5.64	6.21	3.21	3.95	5.18	5.29	6.54	5.75	1.96	2.35	3.30	3.09	3.84	5.45	5.50	4.96	5.29	41.45
	SD	1.75	2.07	1.44	.99	.52	1.10	.62	1.41	.50	.58	1.10	1.15	.93	1.11	.95	1.38	1.09	.81	1.18	.96	1.56	1.29	1.70	1.64	1.17	1.20	1.45	1.14	11.18

Table 11.

Summary of multiple regression analysis for technology use variables and relationship satisfaction (Study 2a)

	B	SE	β	*t*	*p*	CIL	CIU
Intercept	7.320	.546		13.398	.000	6.244	8.396
Relationship length	-.006	.013	-.029	-.466	.642	-.032	.020
Platforms	-.474	.277	-.142	-1.714	.088	-1.019	.070
Frequency online	.027	.102	.017	.261	.794	-.174	.228
Network size	.097	.082	.078	1.181	.239	-.065	.259
Partner connectedness	.353	.257	.102	1.373	.171	-.153	.860
Other connectedness	-.138	.243	-.046	-.566	.572	-.616	.341

Table 12.

Summary of multiple regression analysis for technology use variables and quality of alternatives (Study 2a)

	B	SE	β	*t*	*p*	CIL	CIU
Intercept	3.732	.637		5.860	.000	2.478	4.986
Relationship length	-.041	.015	-.167	-2.727	.007	-.071	-.012
Platforms	.635	.323	.161	1.969	.050	.000	1.270
Frequency online	-4.797E-05	.119	.000	.000	1.000	-.234	.234
Network size	-.017	.096	-.011	-.176	.861	-.206	.172
Partner connectedness	-.003	.300	-.001	-.010	.992	-.594	.588
Other connectedness	-.118	.283	-.033	-.415	.678	-.675	.440

Table 13.

Summary of multiple regression analysis for technology use variables and relationship investment (Study 2a)

	B	SE	β	*t*	*p*	CIL	CIU
Intercept	6.606	.437		15.112	.000	5.745	7.467
Relationship length	.038	.010	.218	3.603	.000	.017	.058
Platforms	-.478	.221	-.175	-2.159	.032	-.914	-.042
Frequency online	.034	.082	.026	.416	.677	-.127	.195
Network size	.129	.066	.126	1.954	.052	-.001	.258
Partner connectedness	.273	.206	.096	1.326	.186	-.133	.679
Other connectedness	.025	.194	.010	.131	.896	-.357	.408

Table 14.

Summary of multiple regression analysis for technology use variables and relationship commitment (Study 2a)

	B	SE	β	*t*	*p*	CIL	CIU
Intercept	6.096	.312		19.556	.000	5.483	6.710
Relationship length	.002	.007	.013	.212	.832	-.013	.016
Platforms	-.148	.158	-.078	-.935	.351	-.459	.163
Frequency online	.067	.058	.075	1.153	.250	-.047	.182
Network size	.057	.047	.081	1.219	.224	-.035	.150
Partner connectedness	.132	.147	.067	.898	.370	-.157	.421
Other connectedness	-.043	.139	-.025	-.308	.758	-.316	.230

Table 15.

Summary of multiple regression analysis for all study variables and relationship satisfaction (Study 2a)

	B	SE	β	*t*	*p*	CIL	CIU
Intercept	3.695	1.122		3.293	.001	1.485	5.904
Relationship length	-.003	.008	-.016	-.407	.684	-.020	.013
Platforms	-.168	.171	-.050	-.984	.326	-.505	.169
Frequency online	-.085	.065	-.054	-1.311	.191	-.212	.043
Network size	.067	.052	.054	1.284	.200	-.036	.170
Partner connectedness	.044	.162	.013	.270	.787	-.275	.362
Other connectedness	-.173	.152	-.057	-1.137	.257	-.472	.127
Rewarding partner	.205	.059	.162	3.461	.001	.088	.322
Rewarding other	.003	.068	.002	.047	.963	-.130	.137
Responsiveness online	-.059	.078	-.039	-.754	.452	-.214	.095
Responsiveness offline	.813	.106	.434	7.670	.000	.604	1.021
Disclosure online	.085	.072	.054	1.169	.243	-.058	.227
Disclosure offline	.023	.092	.013	.254	.800	-.157	.204
Loneliness	-.033	.009	-.211	-3.686	.000	-.051	-.015
Extraversion	-.040	.047	-.038	-.863	.389	-.133	.052
Agreeableness	-.107	.066	-.072	-1.632	.104	-.237	.022
Conscientiousness	.002	.063	.001	.034	.973	-.123	.127
Emotional stability	.094	.060	.078	1.575	.116	-.024	.212
Openness	.004	.063	.003	.065	.948	-.121	.129
Relationship specific attachment avoidance	-.557	.102	-.306	-5.466	.000	-.757	-.356
Relationship specific attachment anxiety	-.051	.059	-.045	-.864	.389	-.167	.065
General attachment avoidance	.103	.058	.076	1.773	.077	-.011	.217
General attachment anxiety	.128	.051	.124	2.515	.013	.028	.228

Table 16.

Summary of multiple regression analysis for all study variables and quality of alternatives (Study 2a)

	B	SE	β	*t*	*p*	CIL	CIU
Intercept	-3.690	1.918		-1.924	.055	-7.467	.087
Relationship length	-.028	.014	-.112	-1.930	.055	-.056	.001
Platforms	.421	.292	.106	1.438	.152	-.155	.997
Frequency online	.062	.111	.033	.556	.579	-.156	.279
Network size	-.049	.089	-.033	-.546	.585	-.224	.127
Partner connectedness	-.159	.277	-.039	-.576	.565	-.704	.385
Other connectedness	.088	.260	.025	.338	.736	-.424	.599
Rewarding partner	-.005	.101	-.004	-.054	.957	-.205	.194
Rewarding other	.056	.116	.029	.482	.630	-.172	.284
Responsiveness online	-.078	.134	-.043	-.581	.562	-.342	.186
Responsiveness offline	.430	.181	.194	2.373	.018	.073	.786
Disclosure online	.232	.124	.125	1.877	.062	-.011	.475
Disclosure offline	-.226	.156	-.104	-1.448	.149	-.535	.082
Loneliness	.073	.015	.394	4.748	.000	.043	.103
Extraversion	.212	.080	.168	2.644	.009	.054	.370
Agreeableness	-.045	.112	-.025	-.401	.689	-.266	.176
Conscientiousness	-.119	.108	-.069	-1.097	.274	-.332	.095
Emotional stability	.202	.102	.141	1.981	.049	.001	.403
Openness	.192	.108	.106	1.770	.078	-.022	.405
Relationship specific attachment avoidance	.879	.174	.408	5.049	.000	.536	1.222
Relationship specific attachment anxiety	-.080	.101	-.060	-.795	.427	-.278	.118
General attachment avoidance	-.373	.099	-.231	-3.752	.000	-.568	-.177
General attachment anxiety	-.082	.087	-.067	-.939	.349	-.253	.090

Table 17.

Summary of multiple regression analysis for all study variables and relationship investment (Study 2a)

	B	SE	β	*t*	*p*	CIL	CIU
Intercept	6.790	1.259		5.393	.000	4.310	9.270
Relationship length	.041	.009	.240	4.398	.000	.023	.060
Platforms	-.132	.192	-.048	-.688	.492	-.510	.246
Frequency online	-.047	.073	-.036	-.649	.517	-.190	.096
Network size	.124	.058	.121	2.114	.036	.008	.239
Partner connectedness	.134	.182	.047	.736	.462	-.224	.491
Other connectedness	-.141	.171	-.057	-.825	.410	-.477	.195
Rewarding partner	-.022	.067	-.021	-.325	.745	-.153	.109
Rewarding other	.090	.076	.068	1.182	.238	-.060	.240
Responsiveness online	-.031	.088	-.025	-.355	.723	-.205	.142
Responsiveness offline	.039	.119	.025	.329	.742	-.195	.273
Disclosure online	.165	.081	.128	2.037	.043	.005	.325
Disclosure offline	-.027	.103	-.018	-.266	.791	-.230	.175
Loneliness	.000	.010	.002	.027	.978	-.020	.020
Extraversion	-.025	.053	-.029	-.481	.631	-.129	.078
Agreeableness	-.029	.074	-.024	-.399	.690	-.175	.116
Conscientiousness	.079	.071	.066	1.103	.271	-.062	.219
Emotional stability	.033	.067	.034	.499	.618	-.099	.165
Openness	-.024	.071	-.019	-.340	.734	-.164	.116
Relationship specific attachment avoidance	-.825	.114	-.552	-7.219	.000	-1.050	-.600
Relationship specific attachment anxiety	.060	.066	.065	.914	.362	-.070	.190
General attachment avoidance	-.053	.065	-.047	-.808	.420	-.181	.076
General attachment anxiety	.173	.057	.204	3.030	.003	.060	.285

Table 18.

Summary of multiple regression analysis for all study variables and relationship commitment (Study 2a)

	B	SE	β	*t*	*p*	CIL	CIU
Intercept	5.260	.884		5.947	.000	3.518	7.002
Relationship length	.001	.007	.012	.222	.824	-.012	.014
Platforms	.077	.135	.040	.568	.570	-.189	.342
Frequency online	.032	.051	.035	.618	.537	-.069	.132
Network size	.029	.041	.041	.700	.484	-.052	.110
Partner connectedness	.019	.128	.010	.150	.881	-.232	.270
Other connectedness	-.162	.120	-.094	-1.351	.178	-.398	.074
Rewarding partner	.027	.047	.038	.581	.562	-.065	.119
Rewarding other	.076	.053	.083	1.418	.157	-.029	.181
Responsiveness online	.006	.062	.008	.105	.917	-.115	.128
Responsiveness offline	.235	.084	.221	2.819	.005	.071	.400
Disclosure online	.001	.057	.001	.018	.986	-.111	.113
Disclosure offline	-.060	.072	-.057	-.835	.405	-.202	.082
Loneliness	-.014	.007	-.152	-1.916	.057	-.028	.000
Extraversion	-.035	.037	-.058	-.955	.340	-.108	.038
Agreeableness	-.010	.052	-.011	-.187	.852	-.112	.092
Conscientiousness	-.036	.050	-.043	-.714	.476	-.134	.063
Emotional stability	.143	.047	.208	3.044	.003	.051	.236
Openness	-.054	.050	-.062	-1.075	.283	-.152	.045
Relationship specific attachment avoidance	-.516	.080	-.498	-6.424	.000	-.674	-.358
Relationship specific attachment anxiety	.102	.046	.160	2.199	.029	.011	.193
General attachment avoidance	.011	.046	.015	.249	.803	-.079	.102
General attachment anxiety	.154	.040	.264	3.852	.000	.075	.233

Table 19.

Correlations and Descriptive Statistics for Study Variables (Study 2b)

	Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
1	SAT	1	-.38*	.44*	.61*	.008	-.022	.026	.050	-.019	.025	.088	.51*	.47*	.31*	.34*	.37*	-.080	.29*	.006	-.63*	-.42*	-.07	-.19*	.089	.18*	.133*	.04	.05	-.33*
2	QOA	-.38*	1	-.36*	-.36*	.096	.065	-.027	.116	.034	.026	-.046	-.19*	-.19*	-.22*	-.23*	-.159*	.079	-.08	.123	.35*	.24*	-.05	.05	.042	-.15*	-.067	-.02	.02	.07
3	INV	.44*	-.36*	1	.50*	-.016	.001	.046	.104	-.024	-.003	-.009	.20*	.19*	.34*	.34*	.21*	-.049	.02	-.082	-.49*	-.16*	-.08	.01	-.067	.09	.096	-.07	-.00	-.01
4	COM	.61*	-.36*	.50*	1	.048	.033	-.066	.055	.038	.010	.125	.28*	.27*	.26*	.25*	.30*	-.150*	.09	-.17*	-.41*	-.03	.02	.00	-.070	.13*	.062	-.03	.05	-.15*
5	PLT	.008	.09	-.01	.04	1	.27*	.27*	.55*	.64*	.52*	.16*	.14*	.12*	.06	.05	.15*	.119	.07	.18*	-.07	.06	-.19*	.03	.133*	.04	-.006	-.03	.01	-.17*
6	FRQ	-.022	.06	.00	.033	.27*	1	.35*	.19*	.15*	.105	.44*	.04	.01	.04	.102	.09	.132*	.00	-.02	-.07	.10	-.14*	.09	.119	.06	-.017	-.06	.07	-.04
7	FRQ2	.026	-.02	.04	-.06	.27*	.35*	1	.21*	.24*	.26*	.17*	.08	.07	.07	.098	.070	.081	-.00	.03	-.15*	.04	-.17*	.09	.15*	-.02	-.007	-.05	.02	-.13*
8	NWS	.050	.11	.10	.05	.55*	.19*	.21*	1	.48*	.36*	.12*	.09	.07	.05	.131*	.047	.17*	.16*	.26*	-.20*	.03	-.26*	-.04	.25*	.07	.041	-.00	.14*	-.18*
9	PCO	-.019	.03	-.02	.03	.64*	.15*	.24*	.48*	1	.61*	.1*	.15*	.09	.08	.006	.143*	.069	-.06	.05	-.03	.05	-.12*	.02	.11	-.00	.017	-.07	-.03	-.10
10	OCO	.025	.02	-.00	.01	.52*	.10	.26*	.36*	.61*	1	.13*	.18*	.13*	.13*	.062	.143*	.100	-.01	.11	-.03	-.00	-.096	.05	.09	.01	.061	-.04	.10	-.06
11	OFRQ	.088	-.04	-.00	.12	.16*	.44*	.17*	.12*	.17*	.13*	1	.09	.10	.07	.073	.123	.018	.08	.00	-.09	-.06	-.078	.01	.13*	.02	.039	.03	.13*	-.13*
12	RSO	.51*	-.19*	.20*	.28*	.14*	.04	.081	.091	.15*	.18*	.09	1	.51*	.48*	.16*	.51*	.057	.06	.02	-.40*	-.32*	-.17*	-.13*	.12*	.18*	.032	.03	-.03	-.22*
13	RSOF	.47*	-.19*	.19*	.27*	.12*	.01	.073	.075	.09	.13*	.10	.51*	1	.27*	.28*	.33*	-.036	.15*	.13*	-.45*	-.23*	-.100	-.13*	.13*	.24*	.20*	.13*	.02	-.24*
14	DSO	.31*	-.22*	.34*	.26*	.06	.04	.074	.054	.08	.13*	.07	.48*	.27*	1	.46*	.41*	.118	-.03	.06	-.41*	-.21*	-.24*	-.06	.02	.163*	.003	.00	.00	-.17*
15	DSOF	.34*	-.23*	.34*	.25*	.054	.10	.098	.131*	.006	.062	.073	.16*	.28*	.46*	1	.15*	-.023	.16*	.02	-.44*	-.17*	-.20*	.02	.01	.136*	.063	-.03	.03	-.15*
16	RPO	.37*	-.15*	.21*	.30*	.156*	.09	.070	.047	.143*	.143*	.123	.51*	.33*	.41*	.15*	1	.20*	.24*	.15*	-.22*	-.10	-.10	.01	.09	.089	-.063	.01	-.02	-.14*
17	ROO	-.080	.07	-.04	-.150*	.119	.13*	.081	.17*	.069	.100	.018	.057	-.036	.118	-.02	.20*	1	.086	.43*	.02	.04	-.19*	-.04	.07	-.031	-.123	-.04	.08	-.09
18	RPOF	.29*	-.08	.02	.092	.075	.00	-.007	.160*	-.064	-.012	.083	.063	.156*	-.039	.16*	.24*	.086	1	.45*	-.16*	-.07	-.07	.01	.07	.077	.070	-.00	.16*	-.10
19	ROOF	.006	.12	-.08	-.17*	.18*	-.022	.035	.26*	.052	.115	.009	.028	.131*	.061	.02	.159*	.43*	.45*	1	-.02	-.05	-.19*	-.083	.13*	.130*	.010	.090	.13*	-.18*
20	RAAV	-.63*	.35*	-.49*	-.41*	-.079	-.075	-.156*	-.20*	-.037	-.033	-.091	-.40*	-.45*	-.41*	-.44*	-.22*	.022	-.16*	-.029	1	.44*	.23*	.16*	-.06	-.29*	-.24*	-.06	-.00	.27*
21	RAAX	-.42*	.24*	-.16*	-.035	.063	.104	.043	.031	.050	-.009	-.062	-.32*	-.23*	-.21*	-.17*	-.10	.047	-.071	-.058	.44*	1	.113	.36*	-.09	-.10	-.24*	-.28*	.03	.25*
22	GAAV	-.07	-.05	-.08	.020	-.19*	-.140*	-.17*	-.26*	-.125*	-.096	-.078	-.17*	-.100	-.24*	-.20*	-.102	-.19*	-.076	-.19*	.23*	.113	1	.24*	-.31*	-.17*	-.00	-.09	-.06	.40*

Table 19 (cont.)

	Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
23	GAAX	-.19*	.05	.01	.00	.03	.09	.09	-.04	.02	.05	.01	-.13*	-.13*	-.06	.02	.01	-.04	.01	-.08	.16*	.36*	.24*	1	-.19*	-.12	-.28*	-.47*	.01	.50*
24	EXT	.089	.04	-.06	-.07	.13*	.11	.15*	.25*	.11	.09	.13*	.12*	.13*	.02	.01	.09	.07	.07	.13*	-.06	-.09	-.31*	-.19*	1	.09	.09	.22*	.20*	-.44*
25	AGR	.18*	-.15*	.09	.13*	.04	.06	-.02	.07	-.00	.01	.02	.18*	.24*	.16*	.13*	.08	-.03	.07	.13*	-.29*	-.10	-.17*	-.12	.09	1	.27*	.23*	.03	-.26*
26	CON	.13*	-.06	.09	.06	-.00	-.01	-.00	.04	.01	.06	.03	.03	.20*	.00	.06	-.06	-.12	.07	.01	-.24*	-.24*	-.00	-.28*	.09	.27*	1	.38*	-.04	-.23*
27	EST	.04	-.02	-.07	-.03	-.03	-.06	-.05	-.00	-.07	-.04	.03	.03	.13*	.00	-.03	.01	-.04	-.00	.09	-.06	-.28*	-.09	-.47*	.22*	.23*	.38*	1	.06	-.40*
28	OPN	.05	.02	-.00	.05	.01	.07	.02	.14*	-.03	.10	.13*	-.03	.02	.00	.03	-.02	.08	.16*	.13*	-.00	.03	-.06	.01	.20*	.03	-.04	.06	1	-.09
29	LON	-.33*	.07	-.01	-.15*	-.17*	-.04	-.13*	-.18*	-.10	-.06	-.13*	-.22*	-.24*	-.17*	-.15*	-.14*	-.09	-.10	-.18*	.27*	.25*	.40*	.50*	-.44*	-.26*	-.23*	-.40*	-.09	1
	M	7.45	4.73	6.27	6.11	1.49	4.73	1.54	6.37	1.06	1.10	5.20	5.53	6.34	3.74	4.20	5.44	5.28	6.52	6.26	2.08	2.86	3.08	3.82	4.58	5.01	5.18	4.41	5.44	41.4
	SD	1.46	1.87	1.73	1.20	.42	.91	.45	1.11	.48	.56	1.12	1.13	.92	.97	.88	1.11	.95	.96	.90	1.07	1.60	1.17	1.69	1.43	1.09	1.22	1.39	.96	11.29

Table 20.

Summary of multiple regression analysis for technology use variables and relationship satisfaction (Study 2b)

	B	SE	β	*t*	*p*	CIL	CIU
Intercept	7.038	.692		10.170	.000	5.675	8.402
Relationship length	.073	.081	.059	.899	.370	-.087	.233
Platforms	.035	.327	.010	.107	.915	-.610	.679
Frequency online	-.041	.108	-.026	-.382	.703	-.253	.171
Network size	.094	.104	.072	.904	.367	-.111	.299
Partner connectedness	-.256	.286	-.085	-.894	.372	-.820	.308
Other connectedness	.114	.217	.044	.524	.601	-.314	.541

Table 21.

Summary of multiple regression analysis for technology use variables and quality of alternatives (Study 2b)

	B	SE	β	*t*	*p*	CIL	CIU
Intercept	3.607	.869		4.152	.000	1.896	5.319
Relationship length	-.290	.102	-.182	-2.842	.005	-.491	-.089
Platforms	.216	.411	.049	.525	.600	-.593	1.025
Frequency online	.047	.135	.023	.347	.729	-.219	.313
Network size	.193	.131	.115	1.476	.141	-.065	.451
Partner connectedness	-.215	.359	-.055	-.597	.551	-.922	.493
Other connectedness	.016	.272	.005	.058	.954	-.521	.552

Table 22.

Summary of multiple regression analysis for technology use variables and relationship investment (Study 2b)

	B	SE	β	*t*	*p*	CIL	CIU
Intercept	4.352	.761		5.719	.000	2.853	5.852
Relationship length	.530	.089	.360	5.938	.000	.354	.706
Platforms	-.087	.360	-.021	-.242	.809	-.796	.622
Frequency online	.042	.118	.022	.353	.724	-.191	.275
Network size	.227	.115	.146	1.979	.049	.001	.452
Partner connectedness	-.252	.315	-.070	-.802	.423	-.872	.368
Other connectedness	-.097	.238	-.032	-.408	.684	-.567	.373

Table 23.

Summary of multiple regression analysis for technology use variables and relationship commitment (Study 2b)

	B	SE	β	*t*	*p*	CIL	CIU
Intercept	5.508	.571		9.640	.000	4.382	6.633
Relationship length	.080	.067	.078	1.199	.232	-.052	.212
Platforms	.104	.270	.037	.384	.701	-.428	.636
Frequency online	.032	.089	.024	.355	.723	-.144	.207
Network size	.036	.086	.033	.418	.676	-.133	.205
Partner connectedness	.046	.236	.019	.196	.844	-.419	.512
Other connectedness	-.087	.179	-.041	-.488	.626	-.440	.265

Table 24.

Summary of multiple regression analysis for all study variables and relationship satisfaction (Study 2b)

	B	SE	β	*t*	*p*	CIL	CIU
Intercept	7.892	1.180		6.687	.000	5.566	10.218
Relationship length	-.009	.058	-.007	-.150	.881	-.122	.105
Platforms	-.119	.219	-.035	-.544	.587	-.551	.312
Frequency online	-.061	.073	-.038	-.837	.403	-.205	.083
Network size	-.021	.075	-.016	-.280	.779	-.168	.126
Partner connectedness	-.171	.192	-.057	-.891	.374	-.549	.207
Other connectedness	.028	.148	.011	.187	.852	-.264	.319
Rewarding partner	.243	.070	.186	3.489	.001	.106	.380
Rewarding other	-.138	.070	-.091	-1.969	.050	-.277	.000
Responsiveness online	.288	.079	.224	3.651	.000	.133	.444
Responsiveness offline	.117	.087	.074	1.350	.178	-.054	.289
Disclosure online	-.190	.087	-.127	-2.183	.030	-.362	-.019
Disclosure offline	.186	.089	.113	2.100	.037	.011	.361
Loneliness	-.028	.008	-.214	-3.574	.000	-.043	-.012
Extraversion	-.027	.052	-.027	-.532	.596	-.129	.074
Agreeableness	-.035	.063	-.026	-.550	.583	-.159	.090
Conscientiousness	-.036	.060	-.030	-.601	.549	-.155	.083
Emotional stability	-.119	.057	-.114	-2.098	.037	-.231	-.007
Openness	.113	.069	.075	1.647	.101	-.022	.249
Relationship specific attachment avoidance	-.575	.085	-.423	-6.765	.000	-.742	-.407
Relationship specific attachment anxiety	-.102	.049	-.112	-2.097	.037	-.198	-.006
General attachment avoidance	.171	.063	.138	2.723	.007	.047	.295
General attachment anxiety	-.044	.048	-.051	-.917	.360	-.139	.051

Table 25.

Summary of multiple regression analysis for all study variables and quality of alternatives (Study 2b)

	B	SE	β	*t*	*p*	CIL	CIU
Intercept	3.761	2.106		1.786	.076	-.390	7.912
Relationship length	-.216	.103	-.136	-2.099	.037	-.419	-.013
Platforms	.211	.391	.048	.540	.590	-.559	.981
Frequency online	.081	.130	.040	.626	.532	-.175	.338
Network size	.283	.134	.168	2.119	.035	.020	.546
Partner connectedness	-.352	.343	-.091	-1.028	.305	-1.028	.323
Other connectedness	.058	.264	.018	.220	.826	-.462	.578
Rewarding partner	-.120	.124	-.071	-.963	.337	-.364	.125
Rewarding other	.090	.125	.046	.719	.473	-.157	.337
Responsiveness online	-.012	.141	-.007	-.088	.930	-.290	.265
Responsiveness offline	.025	.155	.012	.159	.874	-.281	.331
Disclosure online	-.043	.155	-.022	-.274	.784	-.349	.264
Disclosure offline	-.265	.158	-.125	-1.671	.096	-.577	.047
Loneliness	.005	.014	.032	.390	.697	-.022	.033
Extraversion	.003	.092	.003	.038	.970	-.178	.185
Agreeableness	-.165	.113	-.097	-1.462	.145	-.387	.057
Conscientiousness	.106	.108	.069	.982	.327	-.106	.318
Emotional stability	.039	.102	.029	.388	.699	-.161	.239
Openness	-.068	.123	-.035	-.550	.583	-.310	.175
Relationship specific attachment avoidance	.458	.152	.262	3.017	.003	.159	.757
Relationship specific attachment anxiety	.097	.087	.083	1.120	.264	-.074	.268
General attachment avoidance	-.204	.112	-.128	-1.819	.070	-.426	.017
General attachment anxiety	.026	.086	.023	.298	.766	-.144	.195

Table 26.

Summary of multiple regression analysis for all study variables and relationship investment (Study 2b)

	B	SE	β	*t*	*p*	CIL	CIU
Intercept	5.348	1.714		3.120	.002	1.970	8.726
Relationship length	.443	.084	.301	5.296	.000	.278	.608
Platforms	-.076	.318	-.019	-.239	.811	-.703	.551
Frequency online	-.045	.106	-.024	-.429	.668	-.254	.163
Network size	.121	.109	.078	1.115	.266	-.093	.335
Partner connectedness	-.153	.279	-.043	-.549	.584	-.703	.397
Other connectedness	-.171	.215	-.056	-.797	.426	-.594	.252
Rewarding partner	.215	.101	.139	2.131	.034	.016	.415
Rewarding other	-.182	.102	-.101	-1.786	.076	-.383	.019
Responsiveness online	-.075	.115	-.049	-.655	.513	-.301	.151
Responsiveness offline	-.032	.126	-.017	-.253	.800	-.281	.217
Disclosure online	.191	.126	.107	1.510	.133	-.058	.440
Disclosure offline	.260	.129	.133	2.021	.044	.006	.514
Loneliness	.007	.011	.044	.606	.545	-.015	.029
Extraversion	-.074	.075	-.061	-.984	.326	-.221	.074
Agreeableness	-.026	.092	-.016	-.278	.781	-.206	.155
Conscientiousness	.029	.088	.021	.333	.740	-.143	.202
Emotional stability	-.114	.083	-.092	-1.380	.169	-.277	.049
Openness	.103	.100	.057	1.029	.305	-.094	.300
Relationship specific attachment avoidance	-.550	.123	-.341	-4.453	.000	-.793	-.306
Relationship specific attachment anxiety	.016	.071	.015	.232	.817	-.123	.156
General attachment avoidance	-.067	.091	-.045	-.731	.465	-.247	.113
General attachment anxiety	.015	.070	.015	.219	.827	-.122	.153

Table 27.

Summary of multiple regression analysis for all study variables and relationship commitment (Study 2b)

	B	SE	β	*t*	*p*	CIL	CIU
Intercept	5.928	1.255		4.723	.000	3.454	8.401
Relationship length	.033	.061	.032	.532	.595	-.088	.153
Platforms	-.028	.233	-.010	-.119	.905	-.487	.431
Frequency online	-.005	.078	-.004	-.065	.948	-.158	.148
Network size	.015	.080	.014	.194	.847	-.141	.172
Partner connectedness	.058	.204	.023	.285	.776	-.344	.461
Other connectedness	-.111	.157	-.052	-.706	.481	-.421	.199
Rewarding partner	.252	.074	.234	3.409	.001	.106	.398
Rewarding other	-.248	.075	-.197	-3.316	.001	-.395	-.100
Responsiveness online	.094	.084	.089	1.121	.263	-.071	.260
Responsiveness offline	.015	.093	.012	.166	.868	-.167	.198
Disclosure online	.005	.093	.004	.059	.953	-.177	.188
Disclosure offline	.098	.094	.072	1.043	.298	-.087	.284
Loneliness	-.021	.008	-.193	-2.508	.013	-.037	-.004
Extraversion	-.124	.055	-.148	-2.268	.024	-.233	-.016
Agreeableness	-.015	.067	-.013	-.220	.826	-.147	.118
Conscientiousness	.004	.064	.004	.066	.947	-.122	.131
Emotional stability	-.046	.061	-.053	-.756	.451	-.165	.074
Openness	.130	.073	.103	1.768	.078	-.015	.274
Relationship specific attachment avoidance	-.401	.090	-.358	-4.441	.000	-.580	-.223
Relationship specific attachment anxiety	.155	.052	.206	2.993	.003	.053	.257
General attachment avoidance	.128	.067	.125	1.915	.057	-.004	.260
General attachment anxiety	.005	.051	.007	.103	.918	-.096	.106

Figure 1. PEW social media usage data

% of all American adults and internet-using adults who use at least one social
networking site
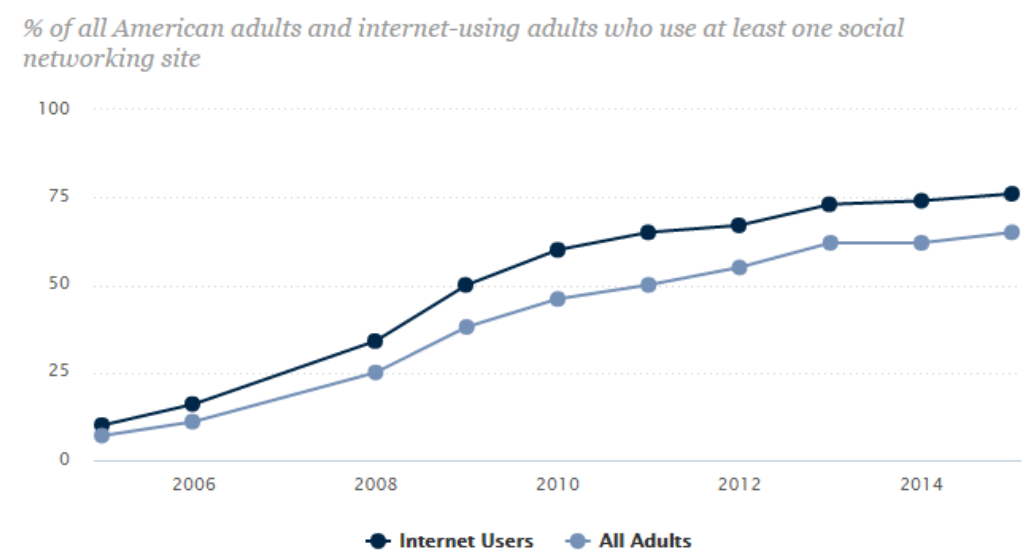
Source: Pew Research Center surveys, 2005-2006, 2008-2015. No data are available for 2007.

PEW RESEARCH CENTER

Figure 2. PEW device ownership data

Figure 3. Commitment funnel plot – inverse sampling variance
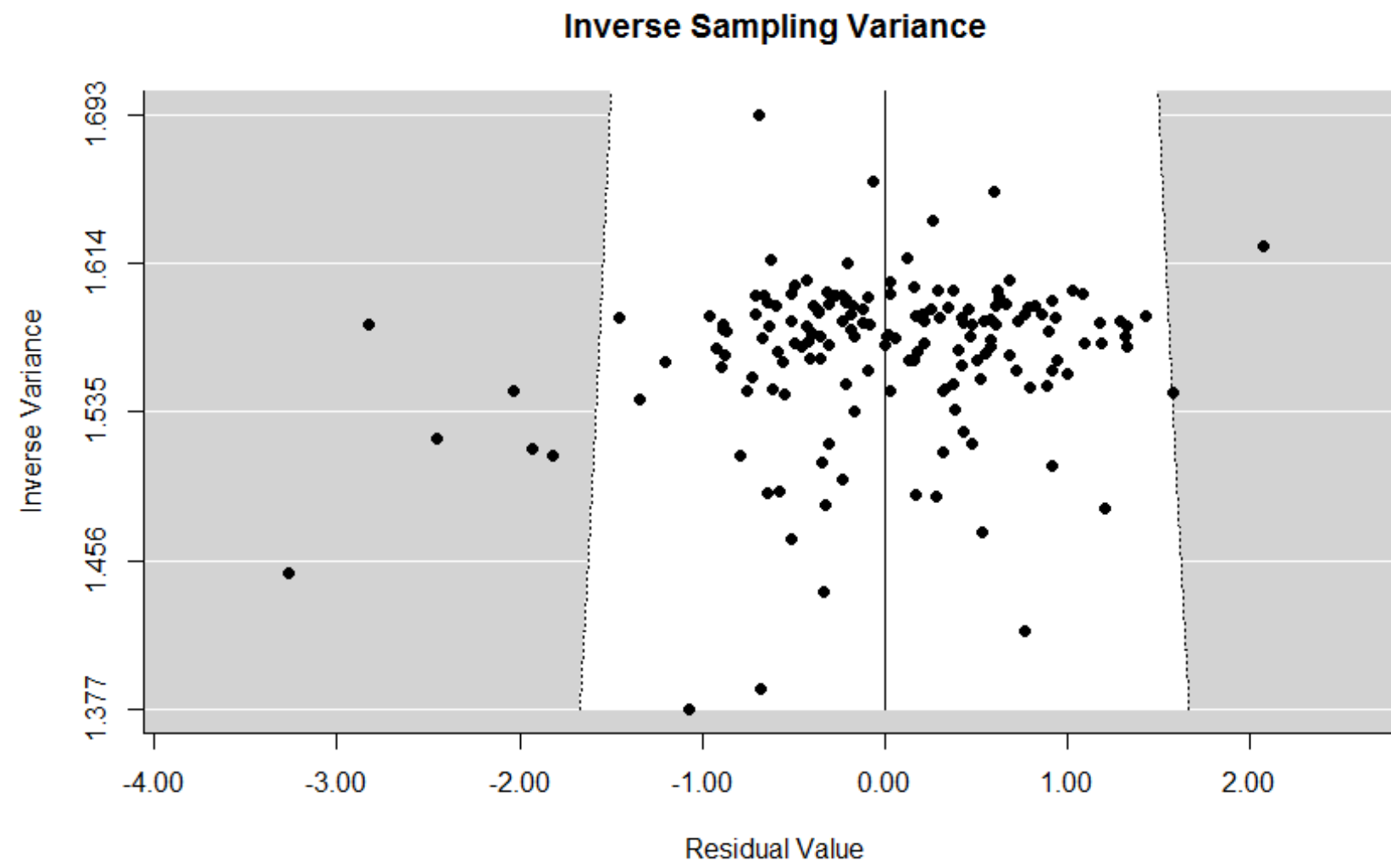
Figure 4. Commitment funnel plot – inverse standard error
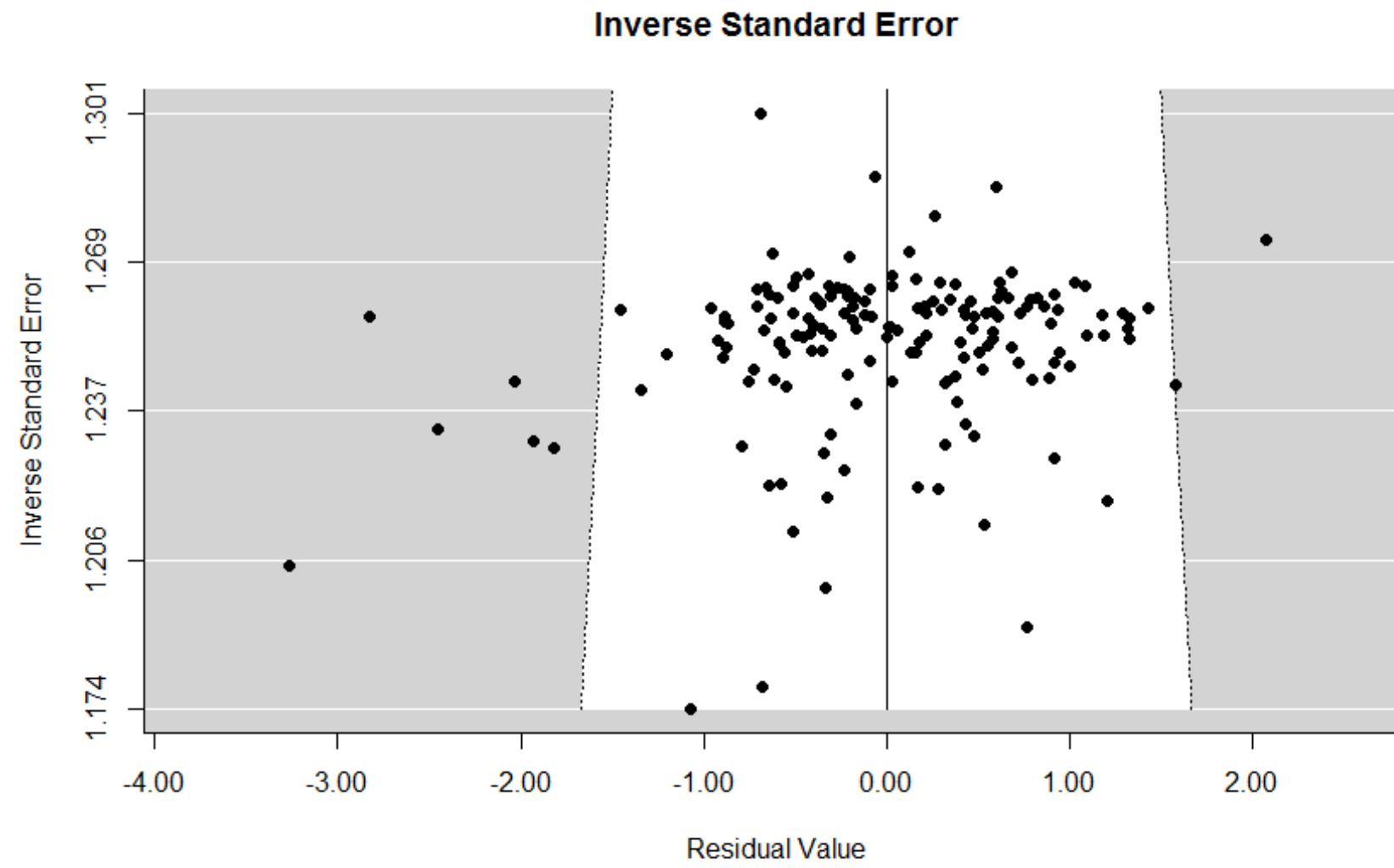
Figure 5. Satisfaction funnel plot – inverse sampling variance
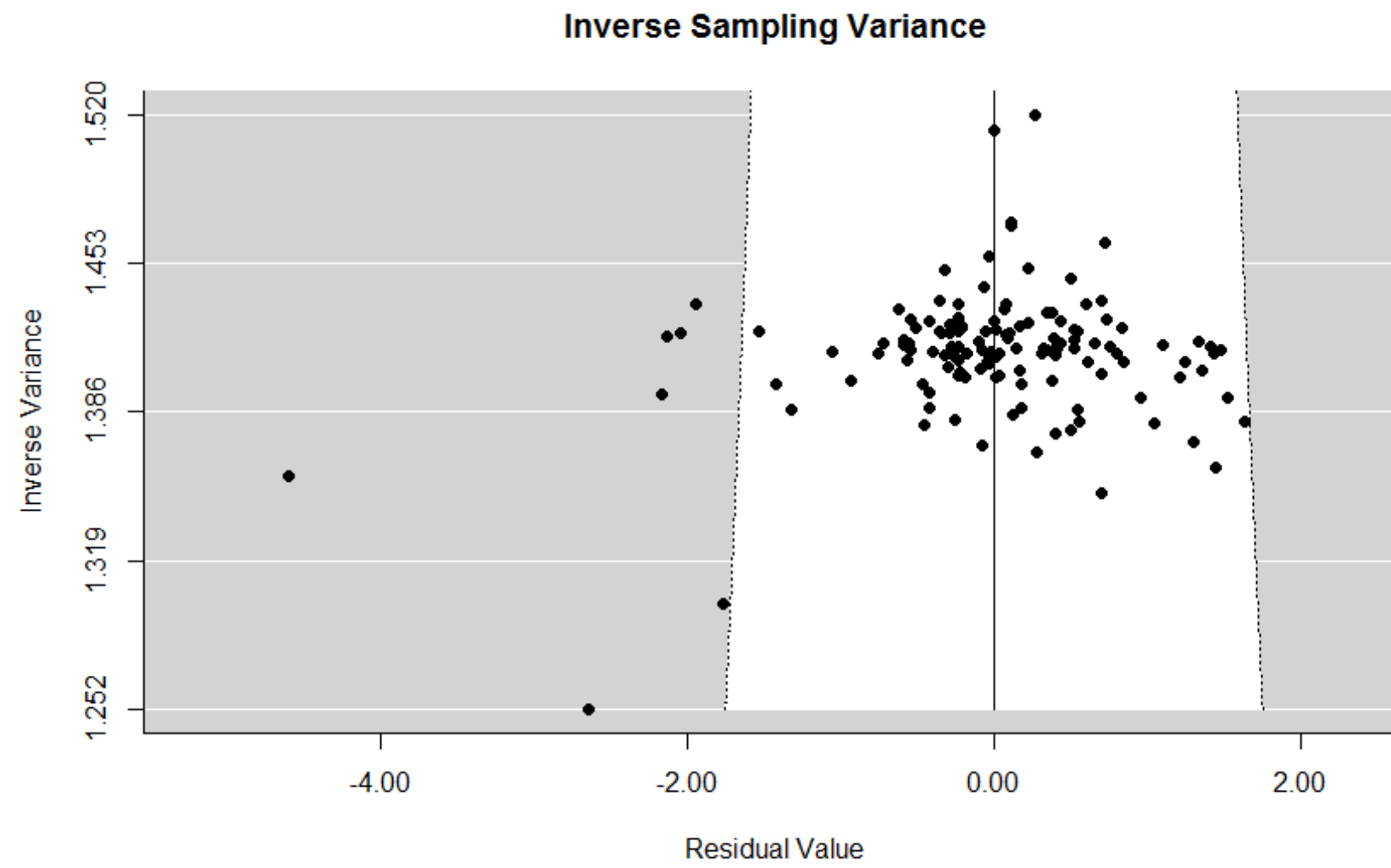
Figure 6. Satisfaction funnel plot – inverse standard error
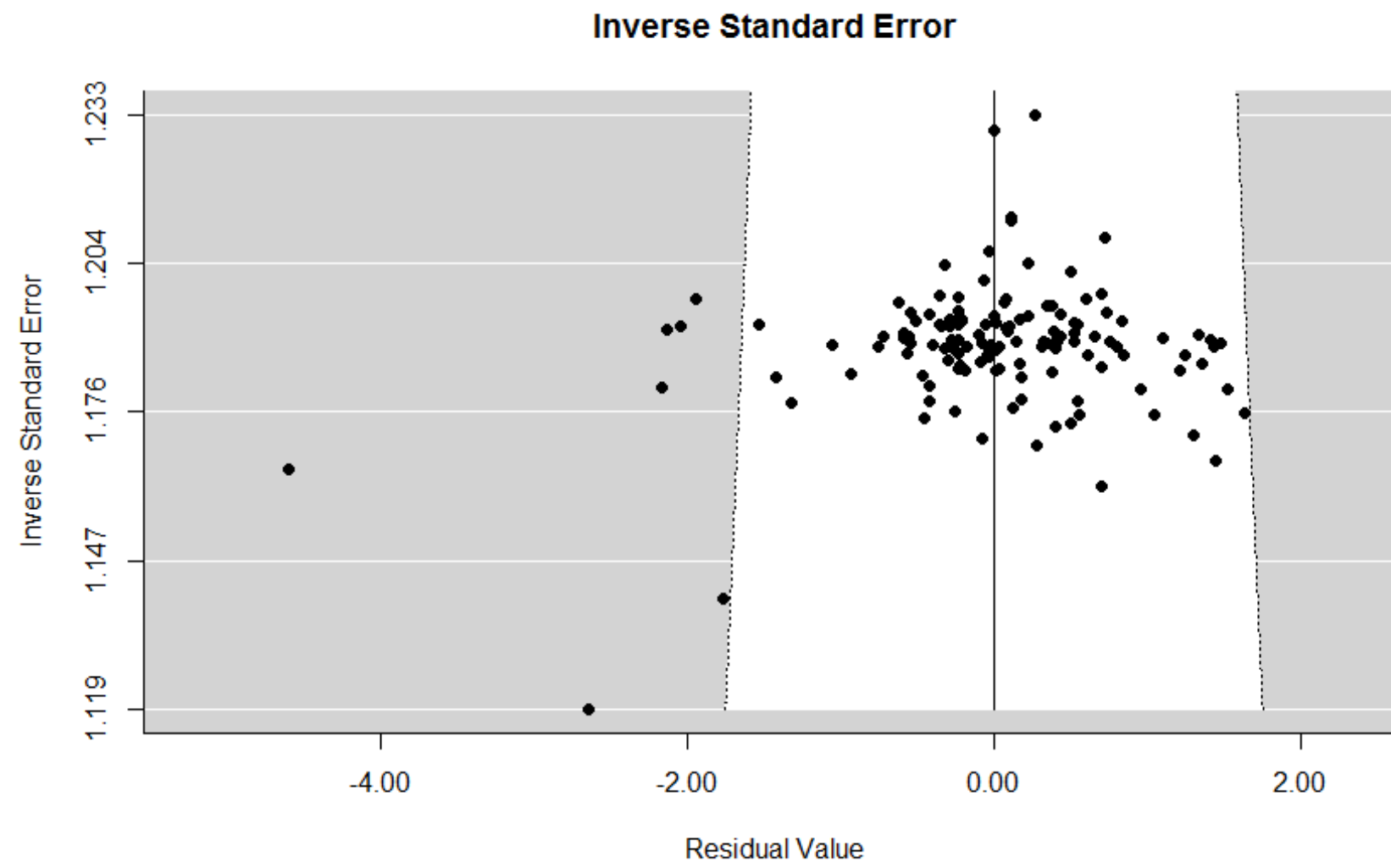
Figure 7. Investment funnel plot – inverse sampling variance
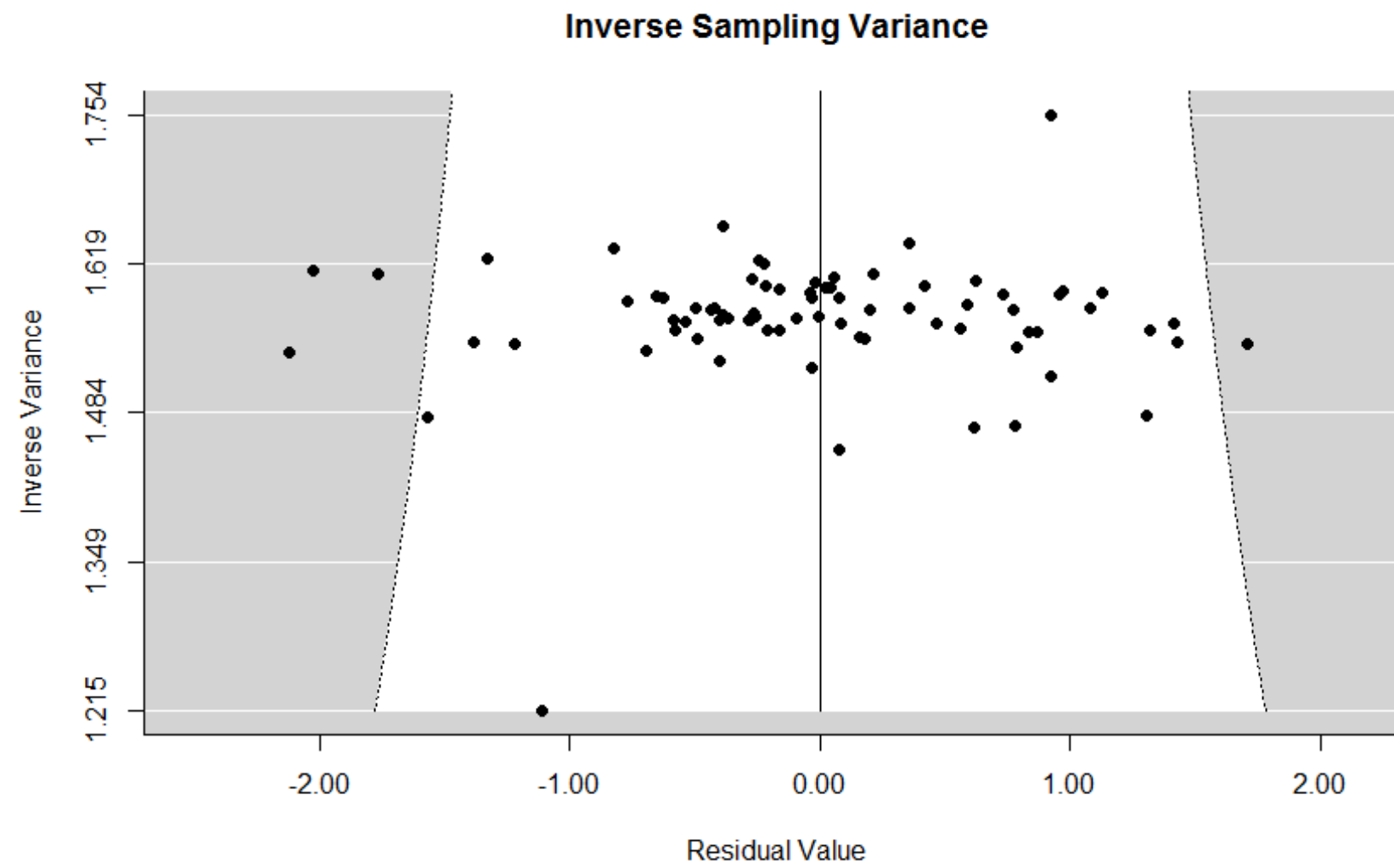
Figure 8. Investment funnel plot – inverse standard error

Inverse Standard Error
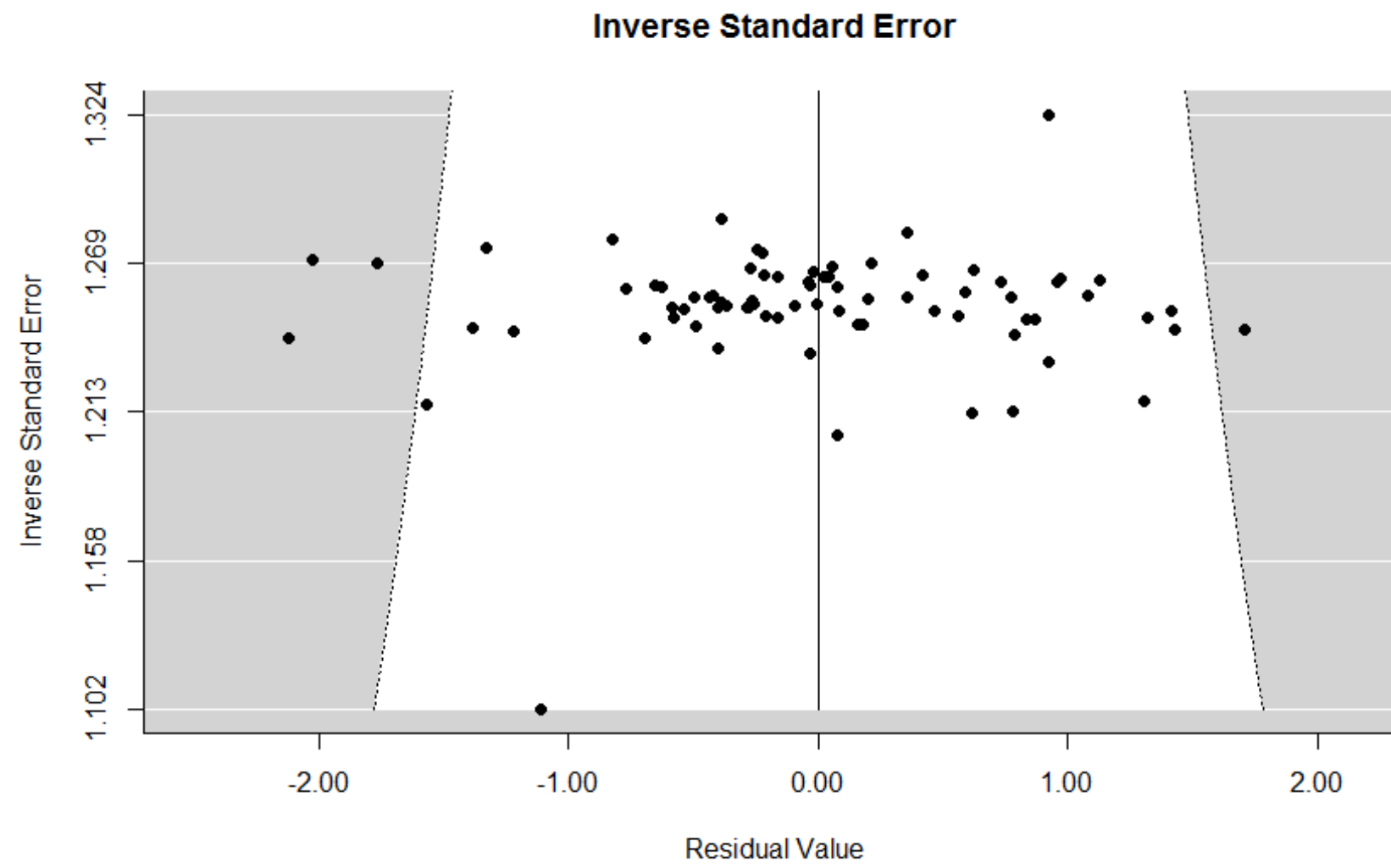
Figure 10. Quality of alternatives funnel plot – inverse standard error
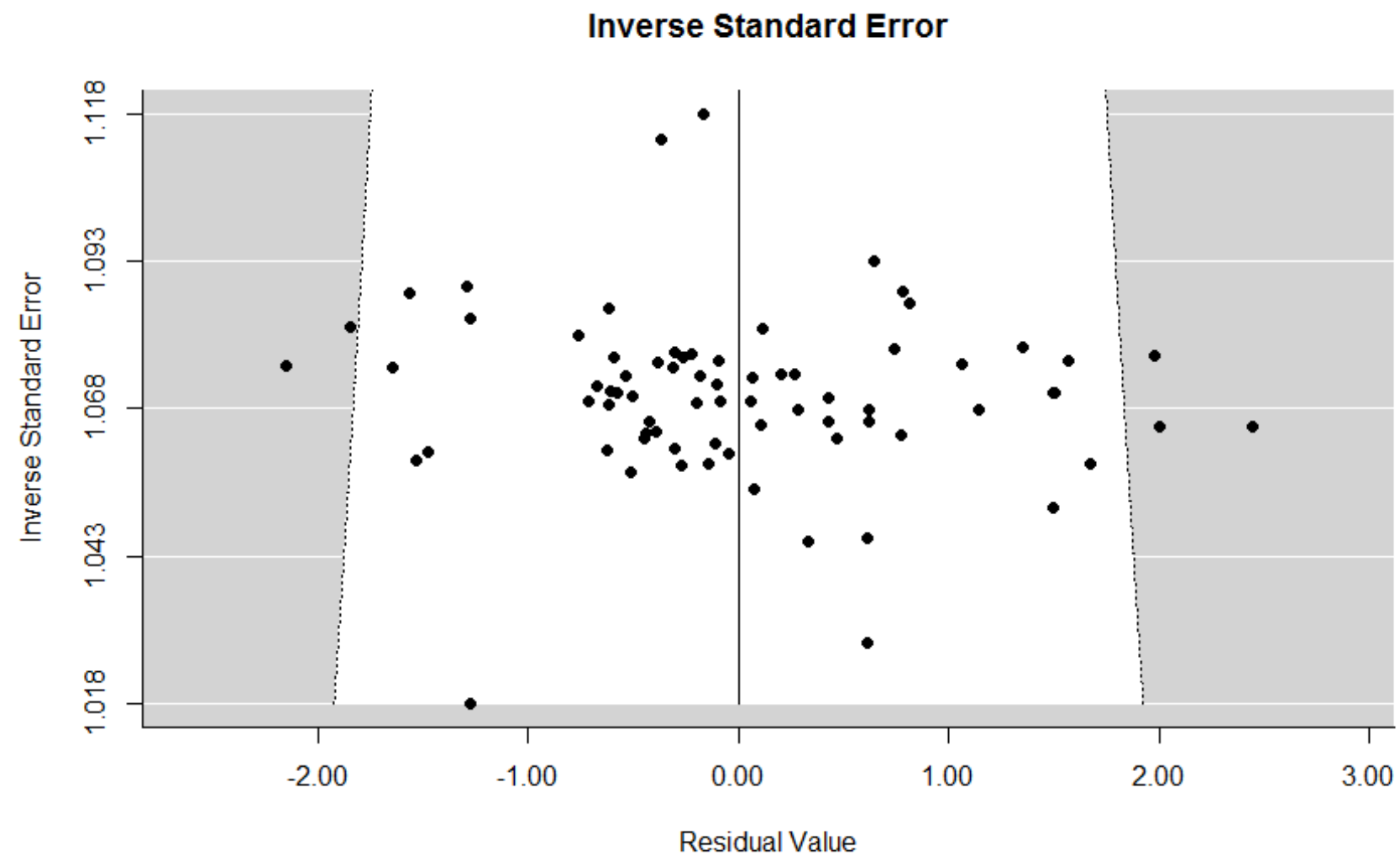
Figure 11. Commitment regression on year
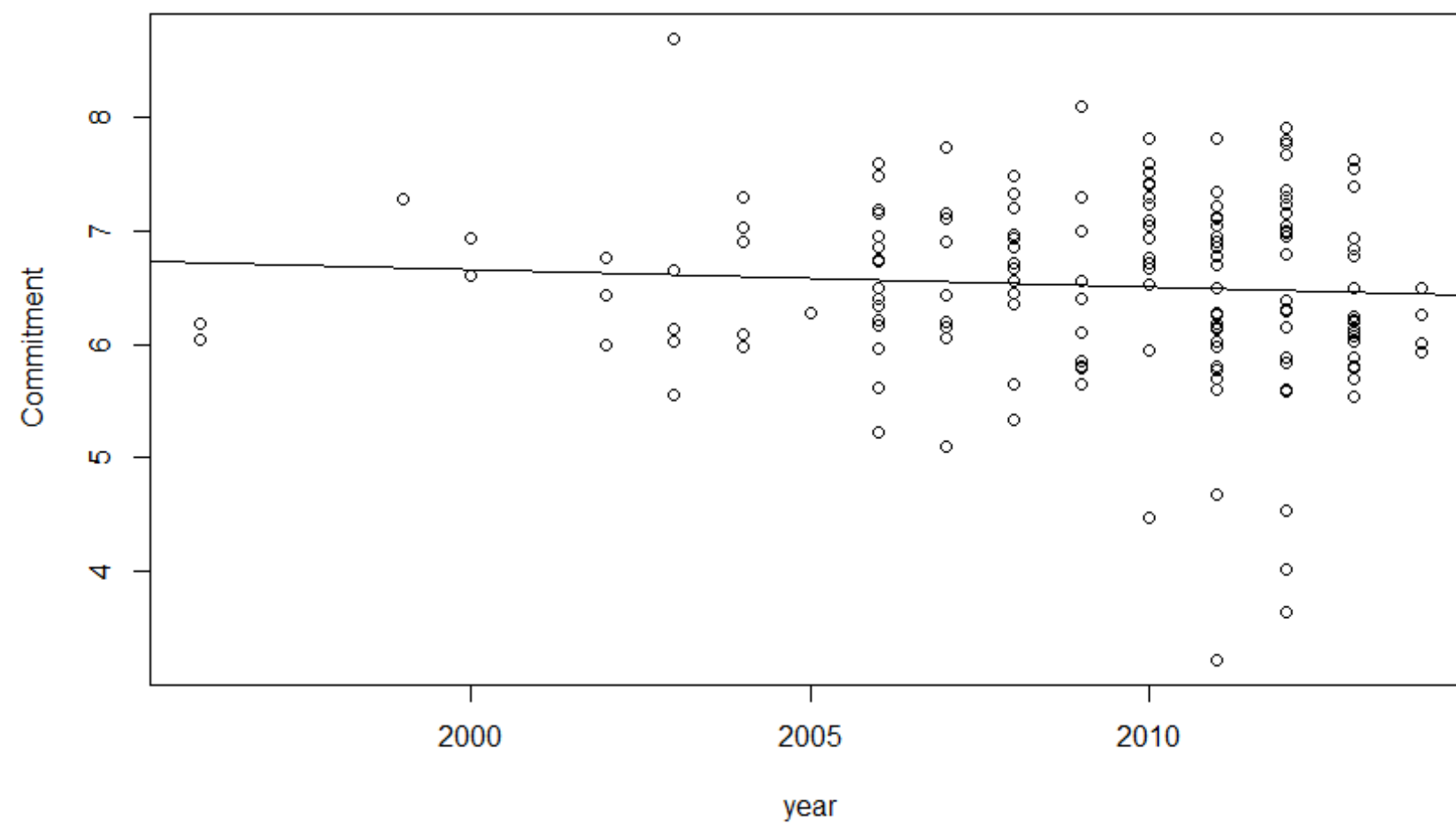
Figure 12. Satisfaction regression on year
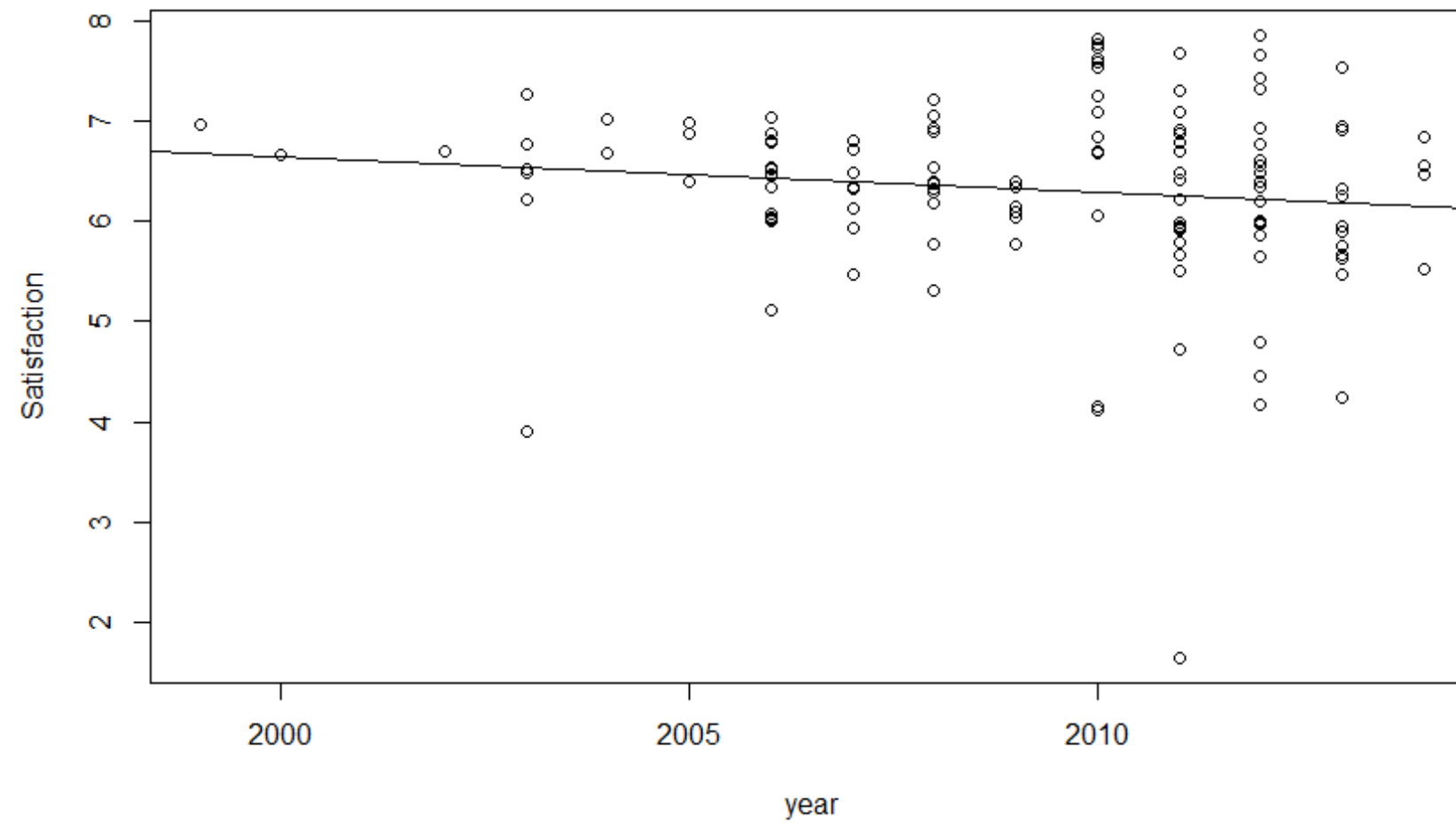
Figure 13. Investment regression on year
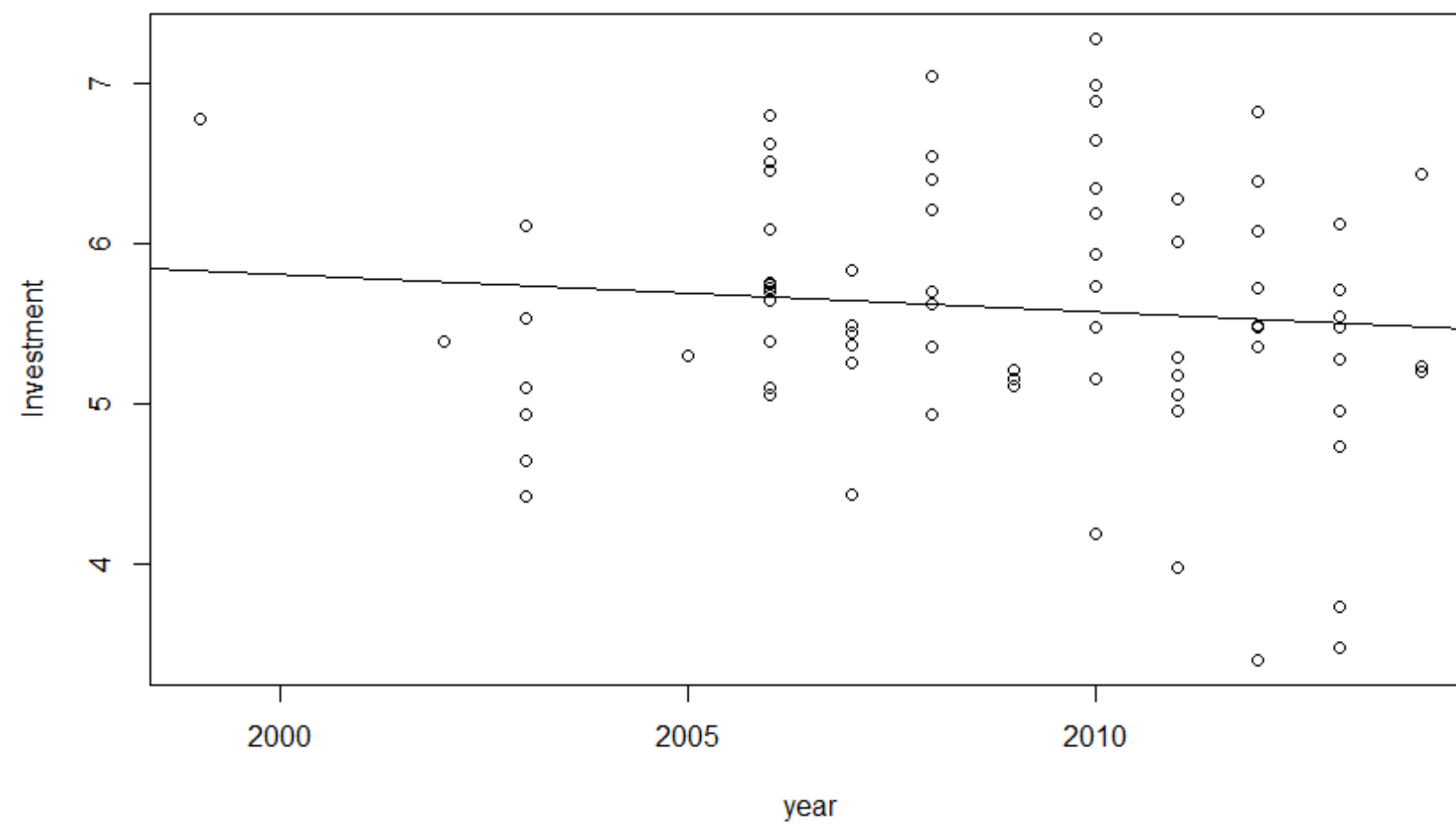
Figure 14. Quality of alternatives funnel regression on year
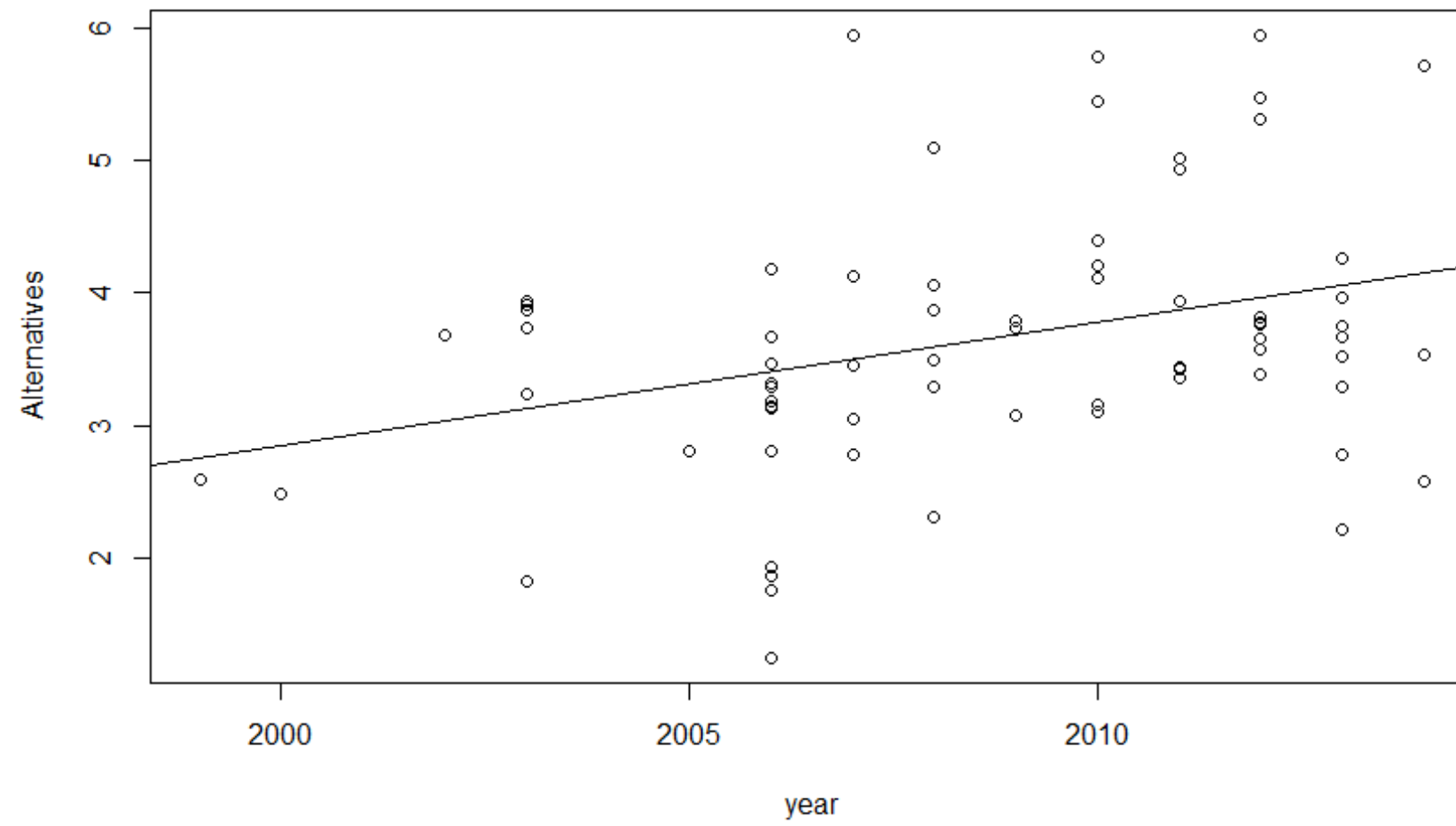
Figure 15. Quality of alternatives regression on year centered with quadratic
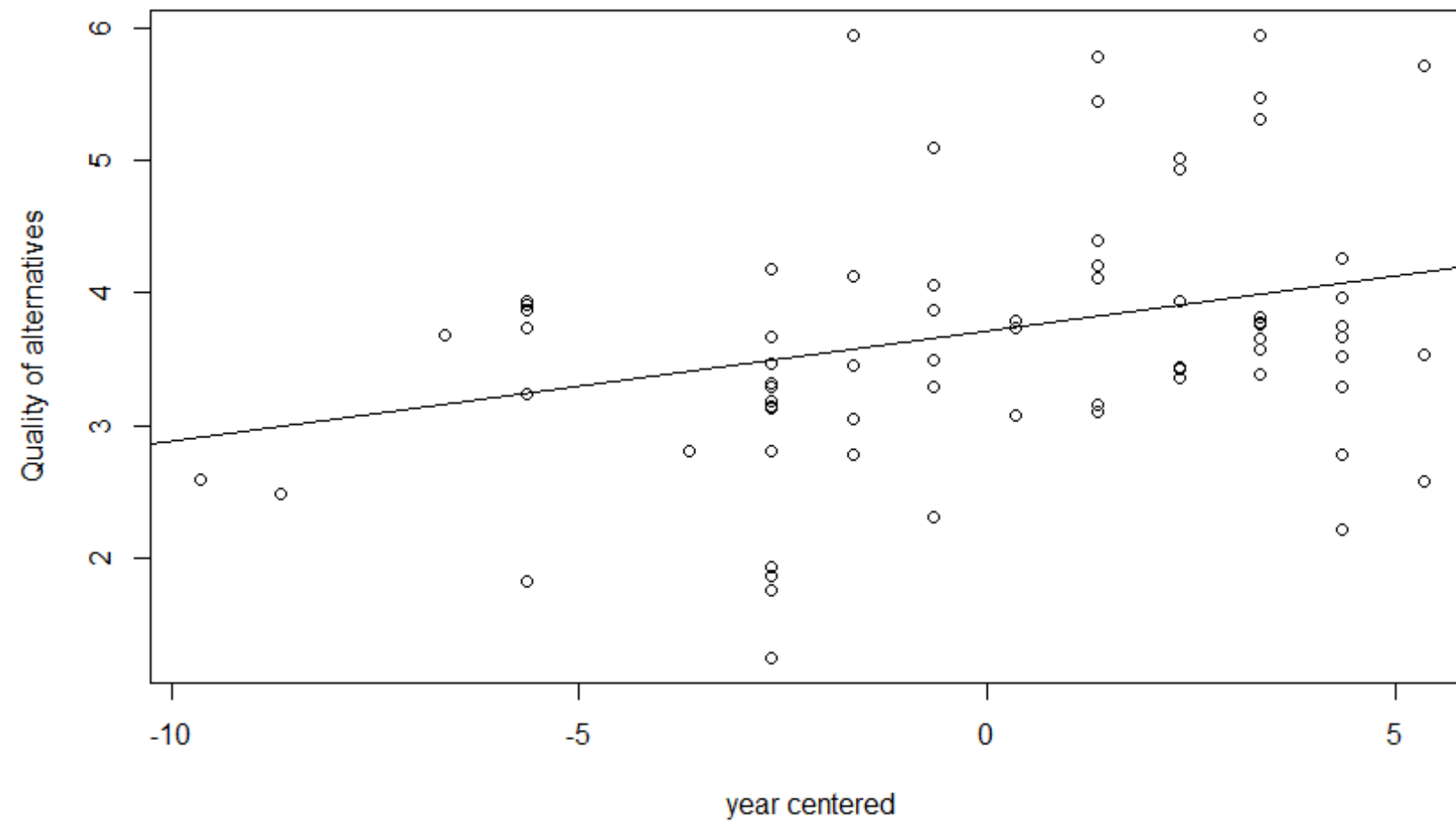
Figure 16. Quality of alternatives regression on social network use
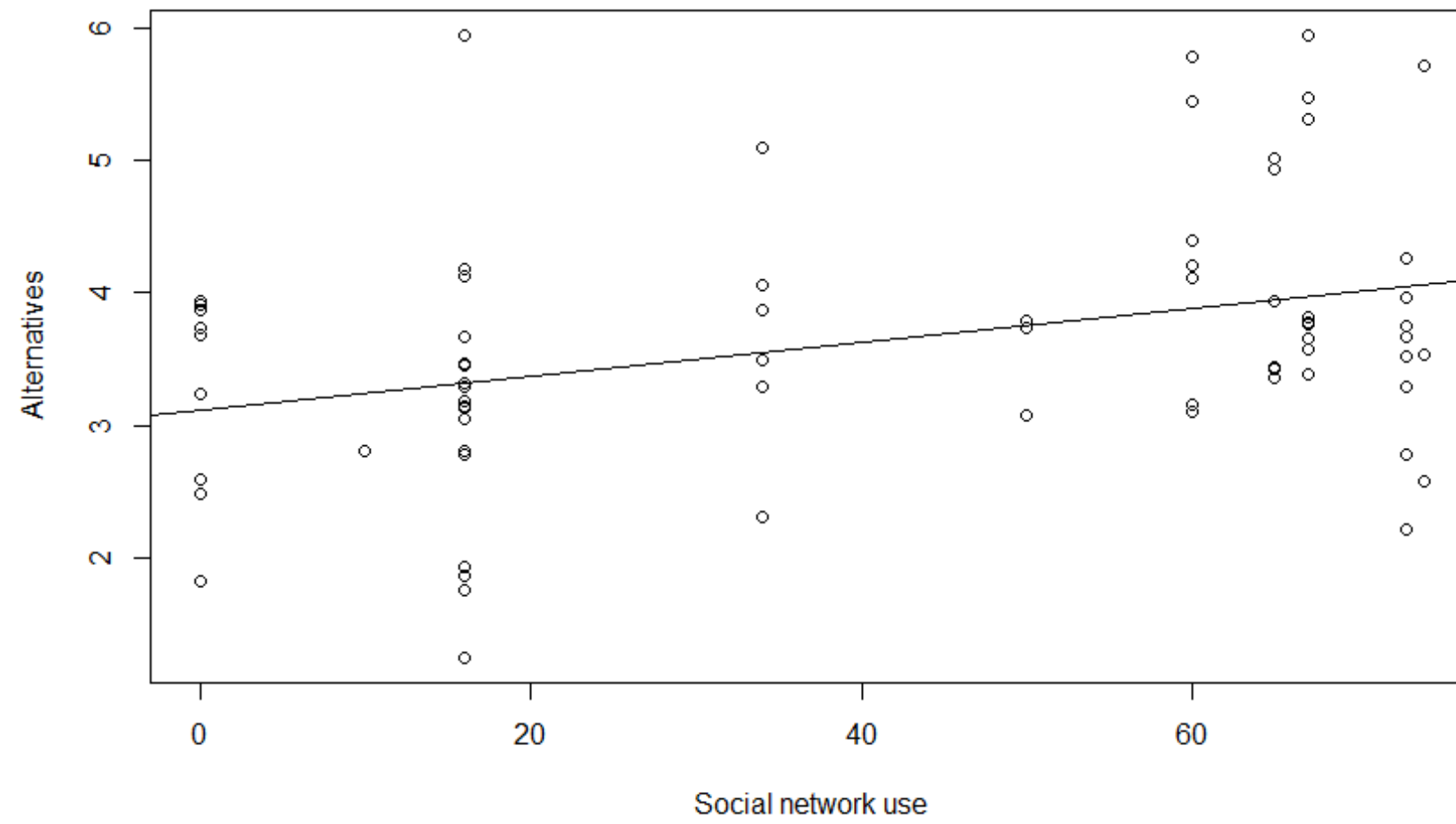
Figure 17. Scatterplot of correlation between Social Network Use and Year of Data Collection
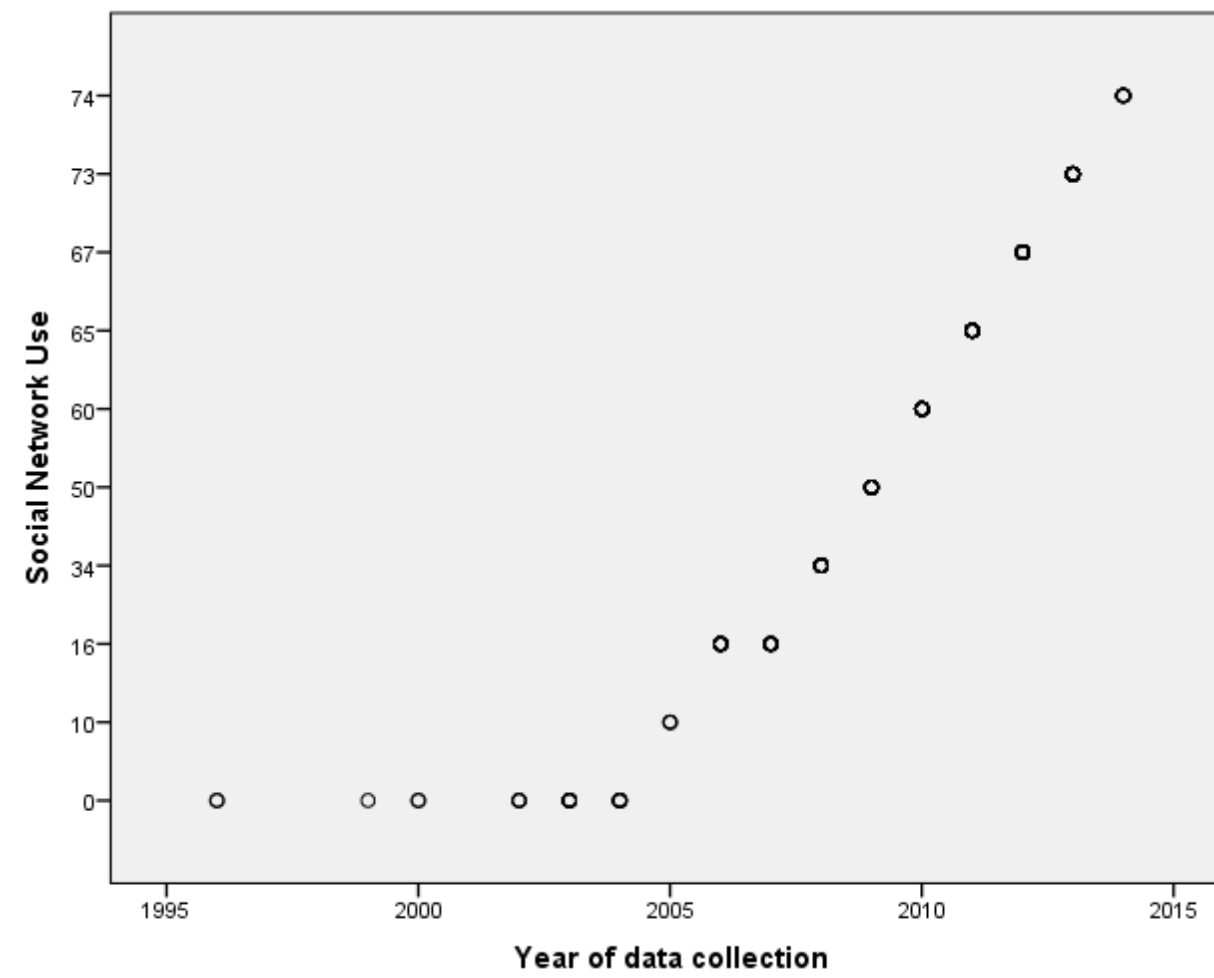
Figure 18. Scatterplot of correlation between Mobile Phone Use and Year of Data Collection

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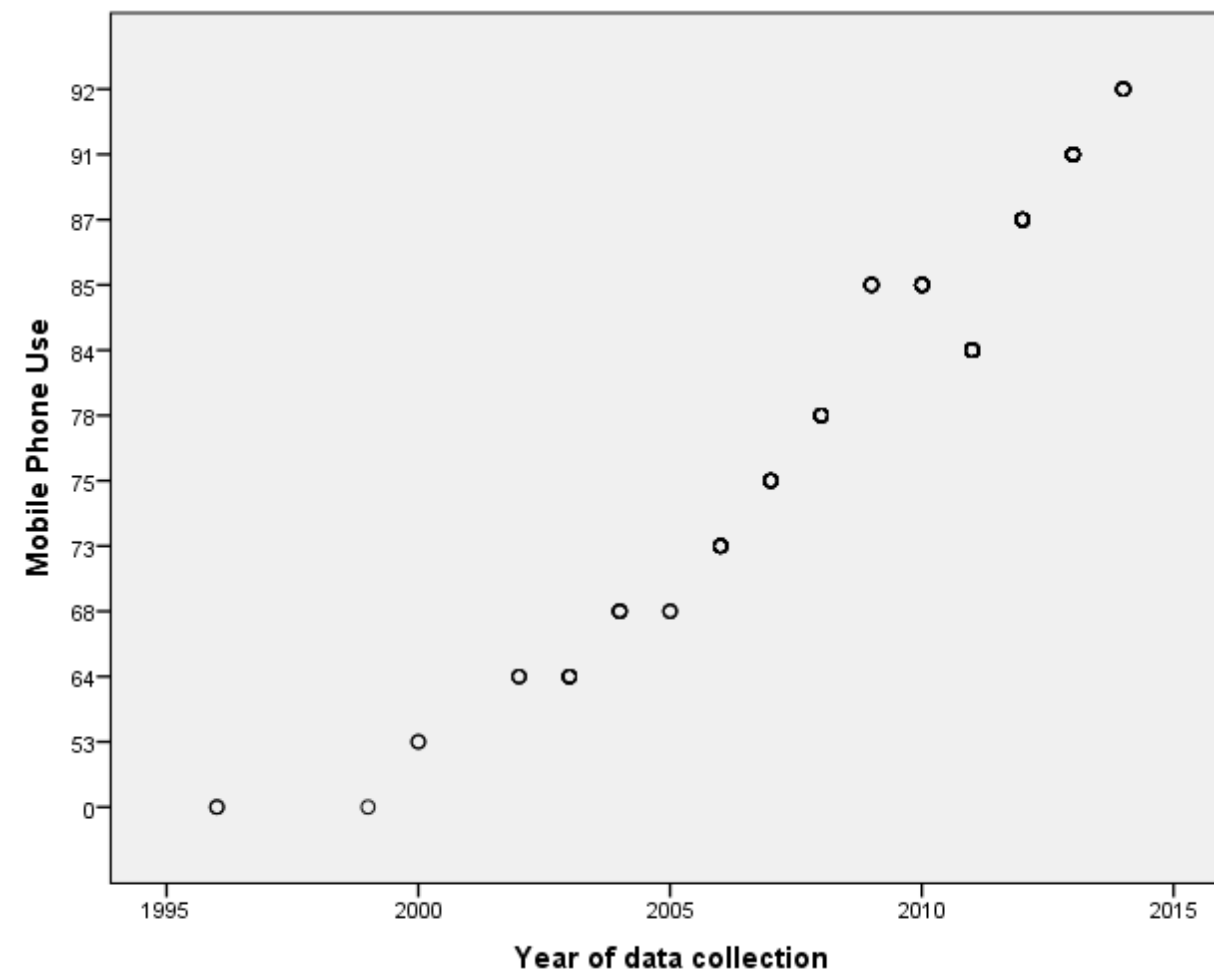
Demographics

How old are you?

What is your sex?

❍ Male
❍ Female
❍ Prefer not to answer

What is your racial background?

❍ American Indian / Alaska Native
❍ Asian
❍ Black or African-American
❍ Native Hawaiian or other Pacific Islander
❍ White / Caucasian
❍ Middle-Eastern
❍ Other or multiracial
❍ Unknown
❍ Prefer not to report

What is your current religion?

○ Catholic
○ Baptist
○ Episcopalian
○ Lutheran
○ Methodist
○ Pentecostal / Charismatic
○ Presbyterian
○ Dutch Reform / Reformed Church/Christian Reform
○ Nondenominational Protestant
○ Latter Day Saint (Mormon)
○ Jehovah's Witness
○ Other Protestant
○ Orthodox Christianity (e.g., Greek Orthodox, Russian Orthodox, etc.)
○ Jewish
○ Muslim
○ Hindu
○ Buddhist
○ Atheist
○ Agnostic
○ Other

What are your political views?

○ Ultra-conservative
○ Conservative
○ Middle of the road
○ Liberal
○ Ultra-liberal
○ Non-conformist
○ Other
○ Prefer not to answer

To the best of your knowledge, what is your family's yearly household income in dollars before taxes?

What is the highest grade or year of school your mother has completed?

- ❍ High School
- ❍ Some college
- ❍ Associates degree
- ❍ Bachelor's degree
- ❍ Graduate school
- ❍ PhD / JD / Other doctoral level degree
- ❍ Post-doc
- ❍ None of the above

What is the highest grade or year of school your father has completed?

- ❍ High School
- ❍ Some college
- ❍ Associates degree
- ❍ Bachelor's degree
- ❍ Graduate school
- ❍ PhD / JD / Other doctoral level degree
- ❍ Post-doc
- ❍ None of the above

From 1-worst off, to 10-best off, where do you stand compared to other persons in the United States in terms of income, education, and occupation?

- ❍ 1 - worst off
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5
- ❍ 6
- ❍ 7
- ❍ 8
- ❍ 9
- ❍ 10 - best off

What is your current relationship status?

❍ Single
❍ Casually dating
❍ In a long-term relationship
❍ Married
❍ Separated
❍ Widowed
❍ It's complicated

If you are in a relationship, do you consider it a committed romantic relationship?

❍ I am in a COMMITTED relationship
❍ I am not in a COMMITTED relationship

How long have you been married / in your current relationship?

_____ Years

Are you currently living with your partner?

❍ Yes
❍ No

Prior to your current romantic relationship, how many long-term, committed relationships have you been in?

Would you say you are currently looking for a romantic partner, or that you are not currently looking for a partner?

❍ Currently looking
❍ Not currently looking
❍ Don't know

TIPI

I see MYSELF as:

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
Extroverted, enthusiastic.	❍	❍	❍	❍	❍	❍	❍
Critical, quarrelsome.	❍	❍	❍	❍	❍	❍	❍
Dependable, self-disciplined.	❍	❍	❍	❍	❍	❍	❍
Anxious, easily upset.	❍	❍	❍	❍	❍	❍	❍
Open to new experiences, complex.	❍	❍	❍	❍	❍	❍	❍
Reserved, quiet.	❍	❍	❍	❍	❍	❍	❍
Sympathetic, warm.	❍	❍	❍	❍	❍	❍	❍
Disorganized, careless.	❍	❍	❍	❍	❍	❍	❍
Please select "disagree".	❍	❍	❍	❍	❍	❍	❍
Calm, emotionally stable.	❍	❍	❍	❍	❍	❍	❍
Conventional, uncreative.	❍	❍	❍	❍	❍	❍	❍

Technology use

Please write the names of the social applications you use on a regular basis (i.e. on a daily, or weekly basis.) Social applications could include social networks (e.g. Facebook, Twitter, Snapchat, Instagram), and texting or messaging apps (e.g. Messenger, regular texting.)

Approximately how much time do you spend using the social applications you mentioned in the previous question daily? (Please answer in minutes)

How often do you open the applications you mentioned in the previous question daily, across your various devices? For example, if you open Facebook 10 times, and Twitter 5 times, please select 15-19 times.

❍ 0-4 times
❍ 5-9 times
❍ 10-14 times
❍ 15-19 times
❍ 20-29 times
❍ 30-39 times
❍ 40-49 times
❍ 50 times or more a day

Of the time you spend using the applications you mentioned, what PERCENT of the time do you spend INTERACTING WITH YOUR ROMANTIC PARTNER daily? (Please answer in percentages, such as "50")

Of the time you spend using the applications you mentioned, what PERCENT of the time do you spend INTERACTING WITH PEOPLE OTHER THAN YOUR ROMANTIC PARTNER daily? (Please answer in percentages, such as "40")

For each social application you included in your first answer, please indicate how many connections/friends/followers you have. For example: Facebook - 250, Twitter - 100.

Please indicate on which platforms you are connected/following/friends with your ROMANTIC PARTNER on, for example: Facebook, Snapchat.

Please indicate on which platforms you are connected/following/friends with people OTHER THAN your ROMANTIC PARTNER on, for example: Facebook, Snapchat.

How REWARDING are your WEB/APP based interactions with your ROMANTIC PARTNER?

- ○ Extremely rewarding
- ○ Moderately rewarding
- ○ Slightly rewarding
- ○ Neither rewarding nor unrewarding
- ○ Slightly unrewarding
- ○ Moderately unrewarding
- ○ Extremely unrewarding

How REWARDING are your WEB/APP based interactions with people OTHER THAN YOUR ROMANTIC PARTNER?

- ○ Extremely rewarding
- ○ Moderately rewarding
- ○ Slightly rewarding
- ○ Neither rewarding nor unrewarding
- ○ Slightly unrewarding
- ○ Moderately unrewarding
- ○ Extremely unrewarding

Offline activity

Please write the names of the top 5-10 "offline" social activities you engage in on a regular basis (i.e. on a daily or weekly basis.) Social activities could include things such as "going for lunch", or "having a drink", or

"going to a game together".

How much time do you spend engaging in "offline" social activities daily? Again, social activities could include things such as going for lunch, or having a drink, or going to a game together. (Please answer in

minutes)

How often do you engage in all of the aforementioned social activities daily? For example, if you typically have lunch with someone, and have a drink after work - select "twice".

- ○ Once
- ○ Twice
- ○ Three times
- ○ Four times
- ○ Five times
- ○ Six times
- ○ Seven times
- ○ 8 times or more

Of the time you spend doing "offline" social activities, what PERCENT of the time do you spend WITH YOUR ROMANTIC PARTNER daily? (Please answer in percentages, such as "50")

Of the time you spend doing "offline" social activities, what PERCENT of the time do you spend WITH PEOPLE OTHER THAN YOUR ROMANTIC PARTNER daily? (Please answer in percentages, such as "40")

Please indicate which of the social activities you mentioned do you do with your ROMANTIC PARTNER, for example: "having lunch together, getting coffee, going out to the movies."

Please indicate which of the social activities you mentioned do you do with people OTHER THAN YOUR ROMANTIC PARTNER, for example: "getting a drink, getting lunch, going on a trip"

How REWARDING are your "offline", social interactions with YOUR ROMANTIC PARTNER?

❍ Extremely rewarding
❍ Moderately rewarding
❍ Slightly rewarding
❍ Neither rewarding nor unrewarding
❍ Slightly unrewarding
❍ Moderately unrewarding
❍ Extremely unrewarding

How REWARDING are your "offline", social interactions with people OTHER THAN YOUR ROMANTIC PARTNER?

❍ Extremely rewarding
❍ Moderately rewarding
❍ Slightly rewarding
❍ Neither rewarding nor unrewarding
❍ Slightly unrewarding
❍ Moderately unrewarding
❍ Extremely unrewarding

Please answer the following questions regarding your perceptions of your ROMANTIC PARTNER when you interact ONLINE (e.g. texting, social media.) Please select the appropriate response.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
When we interact online, I typically feel that my romantic partner cares about me.	❍	❍	❍	❍	❍	❍	❍
When we interact online, I typically feel that my romantic partner understands me.	❍	❍	❍	❍	❍	❍	❍
When we interact online, I typically feel that my romantic partner appreciates me.	❍	❍	❍	❍	❍	❍	❍

When you interact with your romantic partner ONLINE, how often do YOU disclose (talk about) the following things:

	Always	Most of the time	About half the time	Sometimes	Never
Your thoughts	❍	❍	❍	❍	❍
Your emotions	❍	❍	❍	❍	❍
Casual day-to-day topics	❍	❍	❍	❍	❍

Please answer the following questions regarding your perceptions of your ROMANTIC PARTNER when you interact OFFLINE (e.g. face-to-face conversation.) Please select the appropriate response.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
When we interact offline, I typically feel that my romantic partner cares about me.	❍	❍	❍	❍	❍	❍	❍
When we interact offline, I typically feel that my romantic partner understands me.	❍	❍	❍	❍	❍	❍	❍
When we interact offline, I typically feel that my romantic partner appreciates me.	❍	❍	❍	❍	❍	❍	❍

When you interact with your romantic partner OFFLINE, how often do YOU disclose (talk about) the following things:

	Always	Most of the time	About half the time	Sometimes	Never
Your thoughts	❍	❍	❍	❍	❍
Your emotions	❍	❍	❍	❍	❍
Casual day-to-day topics	❍	❍	❍	❍	❍

Investment model scale

Please indicate the degree to which you agree with each of the following statements regarding your current relationship.

	Don't agree at all	Agree slightly	Agree moderately	Agree completely
My partner fulfills my needs for intimacy (sharing personal thoughts, secrets, etc.)	❍	❍	❍	❍
My partner fulfills my needs for companionship (doing things together, enjoying each other's company, etc.)	❍	❍	❍	❍
My partner fulfills my sexual needs (holding hands, kissing, etc.)	❍	❍	❍	❍
My partner fulfills my needs for security (feeling trusting, comfortable in a stable relationship, etc.)	❍	❍	❍	❍
My partner fulfills my needs for emotional involvement (feeling emotionally attached, feeling good when another feels good, etc.)	❍	❍	❍	❍

Please indicate the degree to which you agree with each of the following statements regarding your current relationship.

	Do not agree at all	1	2	3	Agree somewhat	5	6	7	Agree completely
I feel satisfied with our relationship.	❍	❍	❍	❍	❍	❍	❍	❍	❍
My relationship is much better than others' relationships.	❍	❍	❍	❍	❍	❍	❍	❍	❍
My relationship is close to ideal.	❍	❍	❍	❍	❍	❍	❍	❍	❍
Our relationship makes me very happy.	❍	❍	❍	❍	❍	❍	❍	❍	❍
Our relationship does a good job of fulfilling my needs for intimacy, companionship, etc.	❍	❍	❍	❍	❍	❍	❍	❍	❍

Please indicate the degree to which you agree with each statement regarding the fulfillment of each need in alternative relationships (e.g., by another dating partner, friends, family).

	Don't agree at all	Agree slightly	Agree moderately	Agree completely
My needs for intimacy (sharing personal thoughts, secrets, etc.) could be fulfilled in alternative relationships.	❍	❍	❍	❍
My needs for companionship (doing things together, enjoying each other's company, etc.) could be fulfilled in alternative relationships.	❍	❍	❍	❍
My sexual needs (holding hands, kissing, etc.) could be fulfilled in alternative relationships.	❍	❍	❍	❍
My needs for security (feeling trusting, comfortable in a stable relationship, etc.) could be fulfilled in alternative relationships.	❍	❍	❍	❍
My needs for emotional involvement (feeling emotionally attached, feeling good when another feels good, etc.) could be fulfilled in alternative relationships.	❍	❍	❍	❍

Please indicate the degree to which you agree with each of the following statements regarding your current relationship.

	Do not agree at all	1	2	3	Agree somewhat	5	6	7	Agree completely
The people other than my partner with whom I might become involved are very appealing.	○	○	○	○	○	○	○	○	○
My alternatives to our relationship are close to ideal (dating another, spending time with friends or on my own, etc.).	○	○	○	○	○	○	○	○	○
If I weren't dating my partner, I would do fine-I would find another appealing person to date.	○	○	○	○	○	○	○	○	○
My alternatives are attractive to me (dating another, spending time with friends or on my own, etc.).	○	○	○	○	○	○	○	○	○
My needs for intimacy, companionship, etc., could easily be fulfilled in an alternative relationship.	○	○	○	○	○	○	○	○	○

Please indicate the degree to which you agree with each of the following statements regarding your current relationship.

	Don't agree at all	Agree slightly	Agree moderately	Agree completely
I have invested a great deal of time in our relationship.	○	○	○	○
I have told my partner many private things about myself (I disclose secrets to him/her).	○	○	○	○
My partner and I have an intellectual life together that would be difficult to replace.	○	○	○	○
My sense of personal identity (who I am) is linked to my partner and our relationship.	○	○	○	○
My partner and I share many memories.	○	○	○	○

Please indicate the degree to which you agree with each of the following statements regarding your current relationship.

	Do not agree at all	1	2	3	Agree somewhat	5	6	7	Agree completely
I have put a great deal into our relationship that I would lose if the relationship were to end.	○	○	○	○	○	○	○	○	○
Many aspects of my life have become linked to my partner (recreational activities, etc.), and I would lose all of this if we were to break up.	○	○	○	○	○	○	○	○	○
I feel very involved in our relationship - like I have put a great deal into it.	○	○	○	○	○	○	○	○	○
My relationships with friends and family members would be complicated if my partner and I were to break up (e.g. partner is friends with people I care about).	○	○	○	○	○	○	○	○	○
Compared to other people I know, I have invested a great deal in my relationship with my partner.	○	○	○	○	○	○	○	○	○

Please indicate the degree to which you agree with each of the following statements regarding your current relationship.

	Do not agree at all	1	2	3	Agree somewhat	5	6	7	Agree completely
I want our relationship to last for a very long time.	❍	❍	❍	❍	❍	❍	❍	❍	❍
I am committed to maintaining my relationship with my partner.	❍	❍	❍	❍	❍	❍	❍	❍	❍
I would not feel very upset if our relationship were to end in the near future.	❍	❍	❍	❍	❍	❍	❍	❍	❍
It is likely that I will date someone other than my partner within the next year.	❍	❍	❍	❍	❍	❍	❍	❍	❍
I feel very attached to our relationship-very strongly linked to my partner.	❍	❍	❍	❍	❍	❍	❍	❍	❍
I want our relationship to last forever.	❍	❍	❍	❍	❍	❍	❍	❍	❍
I am oriented toward the long-term future of my relationship (for example, I imagine being with my partner several years from now).	❍	❍	❍	❍	❍	❍	❍	❍	❍

Relationship specific attachment

Please answer the following questions about your dating or marital partner:

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I usually discuss my problems and concerns with this person.	○	○	○	○	○	○	○
I talk things over with this person.	○	○	○	○	○	○	○
It helps to turn to this person in times of need.	○	○	○	○	○	○	○
I find it easy to depend on this person.	○	○	○	○	○	○	○
I prefer not to show this person how I feel deep down.	○	○	○	○	○	○	○
I don't feel comfortable opening up to this person.	○	○	○	○	○	○	○
I'm afraid this person may abandon me.	○	○	○	○	○	○	○
I worry that this person won't care about me as much as I care about him or her.	○	○	○	○	○	○	○
I often worry that this person doesn't really care for me.	○	○	○	○	○	○	○

General attachment

Please read each of the following statements and rate the extent to which you believe each statement best describes your feelings about close relationships in general.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
It helps to turn to people in times of need.	○	○	○	○	○	○	○
I usually discuss my problems and concerns with others.	○	○	○	○	○	○	○
I talk things over with people.	○	○	○	○	○	○	○
I find it easy to depend on others.	○	○	○	○	○	○	○
I don't feel comfortable opening up to others.	○	○	○	○	○	○	○
I prefer not to show others how I feel deep down.	○	○	○	○	○	○	○
Please select "Agree".	○	○	○	○	○	○	○
I often worry that other people do not really care for me.	○	○	○	○	○	○	○
I'm afraid that other people may abandon me.	○	○	○	○	○	○	○
I worry that others won't care about me as much as I care about them.	○	○	○	○	○	○	○

Loneliness

The following statements describe how people sometimes feel. For each statement, please indicate how often you feel the way described, by selecting the given responses, from "1 - never" to "4 - always".

	1 - Never	2 - Rarely	3 - Sometimes	4 - Always
How often do you feel that you are "in tune" with the people around you?	○	○	○	○
How often do you feel that you lack companionship?	○	○	○	○
How often do you feel that there is no one you can turn to?	○	○	○	○
How often do you feel alone?	○	○	○	○
How often do you feel part of a group of friends?	○	○	○	○
How often do you feel that you have a lot in common with the people around you?	○	○	○	○
How often do you feel that you are no longer close to anyone?	○	○	○	○
How often do you feel that your interests and ideas are not shared by those around you?	○	○	○	○
How often do you feel outgoing and friendly?	○	○	○	○
How often do you feel close to people?	○	○	○	○
How often do you feel left out?	○	○	○	○
How often do you feel that your relationships with others are not meaningful?	○	○	○	○
How often do you feel that no one really knows you well?	○	○	○	○
How often do you feel isolated from others?	○	○	○	○
How often do you feel you can find companionship when you want it?	○	○	○	○
How often do you feel that there are people who really understand you?	○	○	○	○
How often do you feel shy?	○	○	○	○
How often do you feel that people are around you but not with you?	○	○	○	○
How often do you feel that there are people you can talk to?	○	○	○	○
How often do you feel that there are people you can turn to?	○	○	○	○

APPENDIX C – IRB APPROVAL LETTER

UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

Office of the Vice Chancellor for Research

Office for the Protection of Research Subjects
528 East Green Street
Suite 203
Champaign, IL 61820

May 11, 2016

R. Chris Fraley
Psychology
429 Psychology Building
603 East Daniel Street
Champaign, IL   61820

RE: *Relationship Functioning Before and During the Digital Age*
         IRB Protocol Number: 16851

Dear Dr. Fraley:

Thank you for submitting the completed IRB application form for your project entitled *Relationship Functioning Before and During the Digital Age*. Your project was assigned Institutional Review Board (IRB) Protocol Number 16851 and reviewed. It has been determined that the research activities described in this application meet the criteria for exemption at 45CFR46.101(b)(2).

This determination of exemption only applies to the research study as submitted. Please note that additional modifications to your project need to be submitted to the IRB for review and exemption determination or approval before the modifications are initiated.

Copies of the attached, date-stamped consent form(s) are to be used when obtaining informed consent. If there is a need to revise or alter the consent form(s), please submit the revised form(s) for IRB review, approval, and date-stamping prior to use.

Exempt protocols will be closed and archived five years from the date of approval. Researchers will be required to contact our office if the study will continue beyond five years. If an amendment is submitted once the study has been archived, researchers will need to submit a new application and obtain approval prior to implementing the change.

We appreciate your conscientious adherence to the requirements of human subjects research. If you have any questions about the IRB process, or if you need assistance at any time, please feel free to contact me at OPRS, or visit our website at http://oprs.research.illinois.edu

Sincerely,

Michelle Lore, MS
Human Subjects Research Specialist, Office for the Protection of Research Subjects

Attachment(s): Consent forms

c: Noam Segal

U of Illinois at Urbana-Champaign • IORG0000014 • FWA #00008584
telephone (217) 333-2670 • *fax* (217) 333-0405 • *email* IRB@illinois.edu

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