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2016

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UNIVERSITY OF CALIFORNIA

Los Angeles

Financial and Social Capital in Marriage

A dissertation submitted in partial satisfaction of the
requirements for the degree Doctor of Philosophy
in Psychology

by

Grace Louise Jackson

2016

ABSTRACT OF THE DISSERTATION

Financial and Social Capital in Marriage

by

Grace Louise Jackson

Doctor of Philosophy in Psychology

University of California, Los Angeles 2016

Professor Benjamin R. Karney, Chair

Popular culture is rife with messages telling couples that they alone have the power to improve their relationship. But couples are embedded in a physical and social context that can also exert both subtle and direct influence. This dissertation serves to enhance our understanding of how two external forces influence marital functioning. The first two papers examine financial resources, and the second two examine social resources. The first paper describes the challenges low-income couples face, highlighting that even when asked to report about problems *within* their marriage, lower-income couples describe salient problems *external* to their marriage (i.e., finances, children). The second paper examines differences between lower and higher income couples' marital satisfaction trajectories, indicating that, on average, lower income couples are not less satisfied in their marriages initially, nor do they decline more quickly over time. Rather, lower income couples' marital satisfaction fluctuates more between assessments, and there are greater differences between lower-income spouses than higher-income spouses. These two studies highlight that efforts to improve lower-income couples' relationships should address both relational and contextual stressors targeted to specific couples at specific points in time. The third paper is a theoretical and quantitative review of the literature on social networks and

relationship quality and stability. Findings from the 118 peer-reviewed studies indicate that supportive and approving social networks containing high-quality relationships are associated with better and longer-lasting relationships. However, much remains to be examined with respect to the structure of couple's networks, longitudinal associations that clarify directionality, and moderators of these processes. The final paper examines how four-year marital satisfaction trajectories and divorce rates gathered in four independent samples of newlywed couples were predicted by the shape of couple's courtships: 1) where couples met, 2) the length of their courtship, 3) whether spouses were friends before dating, and 4) whether partners cohabited before marriage. Across all four studies, these courtship experiences did not account for divorce, initial marital satisfaction, or slopes of satisfaction. Together, these studies offer a nuanced look at how couples' physical and social contexts can exacerbate and buffer them from relational distress to inform theory and practice.

The dissertation of Grace Louise Jackson is approved.

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ACKNOWLEDGEMENTS

The data used in these studies were funded by research grants HD053825 and HD061366 from the National Institute of Child Health and Human Development awarded to Benjamin R. Karney (Chapters 1 and 2), and research grants from the Fetzer Institute "Memory bias in early marriage" and "Compassionate love and social support in early marriage" and the National Institute of Mental Health MH59712 awarded to Benjamin R. Karney in 2000, 2003, and 2004 respectively (Chapter 4), as well as a National Institute of Mental Health Grant MH48674 awarded to Thomas N. Bradbury (Chapter 4).

Chapter 1 has been published in the *Journal of Family Psychology*. Copyright © 2016 by the American Psychological Association. The official citation that should be used in referencing this material is:

Jackson, G. L., Trail, T.E., Kennedy, D.P., Williamson, H.C., Bradbury, T.N., & Karney, B.R. (2016). The salience and severity of relationship problems among low-income couples. *Journal of Family Psychology, 30*(1), 2-11. DOI: 10.1037/fam0000158

The use of this information does not imply endorsement by the publisher. Thomas E. Trail, David P. Kennedy, Hannah C. Williamson, Thomas N. Bradbury and Benjamin R. Karney were co-authors. Thomas E. Trail and David P. Kennedy conducted the preliminary coding and salience analyses. Hannah C. Williamson and Thomas N. Bradbury provided feedback on the manuscript, Benjamin R. Karney supervised the manuscript preparation, and was the PI on the grant that the study was based on.

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Chapters 3 and 4 have not yet been submitted for publication, but Thomas N. Bradbury and Benjamin R. Karney are co-authors on each of these papers. In both papers, Thomas N. Bradbury provided feedback on the manuscript, and Benjamin R. Karney supervised the manuscript preparation. In Chapter 4, Thomas N. Bradbury was the PI on the grants that funded Samples 1 and 2, and Benjamin R. Karney was the PI on the grants that funded Samples 3 and 4.

I gratefully acknowledge the invaluable support and mentorship of my advisor and committee chair, Benjamin Karney, as I completed this dissertation. Special thanks as well to Thomas Bradbury, who played an integral role in shaping this work. I am also grateful for the two other members of my dissertation committee – Christine Dunkel Schetter and Megan Sweeney – who provided thoughtful feedback and encouragement. I would also like to thank my labmates Justin Lavner and Hannah Williamson for helping me refine the ideas included here, as well as Teresa, Jackie, Julia, and Victor for encouragement along the way. And, I would like to thank the countless hours of coding my research assistants volunteered over the last several years: Kelly Campbell, Elizabeth Glanzer, Maya Harel, Amber Piatt and Davina Simantob (Study 1), Melanie Carpenter, Benjamin Higgins and Tenya Mai Thurston (Study 3) and Jenni Fiederer, Lori Hinckley, Atina Manvelian, Danny Martinez, Robert Paul, Kevin Shaw, Van Tran, Stephanie Tuncel and Jessica Wibawa (Study 4).

Finally, to the many friends, family and loved ones who shared the journey with me – thank you for cheering me on along the way. I'm so lucky to have so much social capital myself!

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GENERAL INTRODUCTION

Although 97% of Americans get married (Kreider & Fields, 2001), approximately 50% of first marriages end in divorce (Bramlett & Mosher, 2002), and divorce rates for remarriages are even higher (Cherlin, 1992). The negative effects of marital dissolution are far-reaching and serious, including increased risk for physical and emotional problems (Horn, Xu, Beam, Turkheimer, & Emery, 2013; Kiecolt-Glaser & Newton, 2001), mortality (Sbarra, Law, & Portley, 2011), greater economic hardship (Amato, 2000; P. J. Smock, Manning, & Gupta, 1999), as well as disruptions in the mental health and educational success of children (e.g., Amato, 2001; Seltzer, 1994). Given the negative consequences of being in an unhappy relationship or ending a marriage, what accounts for whether a couple remains in a happy and long-lasting marriage or not?

Extensive research has attempted to explain why some marriages are successful, happy and fulfilling when others are distressing and eventually dissolve. Following from classic theories of family stress processes (e.g., Hill, 1949), research has increasingly examined the forces *outside* of couples that impact their interactions *within* the relationship. Demographic and sociological work has documented that divorce rates change drastically across different environments. For example, marital success and failure is powerfully associated with socioeconomic status (Fein, 2004). These theories highlight the resources and supports outside the couple that contribute to successful relationships. Two resources in particular that are important in helping couples succeed are financial resources and social resources.

Access to greater financial resources can buffer couples in times of stress and promote a positive relational environment between partners, whereas having few financial resources can make relationship functioning more stressful and difficult to maintain. Although maintaining a fulfilling marriage is challenging in all segments of society, divorce rates are nearly twice as high

in lower-income communities as in more affluent communities (Bramlett & Mosher, 2002; Raley & Bumpass, 2003). Research confirms that not only do lower-income couples have less stable marital outcomes, but financially stressed couples also experience their relationships as less satisfying, (e.g., Conger et al., 1990) and have more relationship problems (Trail & Karney, 2012). The vulnerability-stress-adaptation model (Karney & Bradbury, 1995) provides a framework for understanding this association, suggesting that marital satisfaction and marital stability are the result of a combination of the couples' enduring vulnerabilities, stressful contexts, and adaptive processes. Lower-income couples' marriages, by definition, develop within environments characterized by economic hardship, limited resources, and underemployment (Karney, Garvan, & Thomas, 2003; McLeod & Kessler, 1990), which all can lead to increased exposure to stress and stressful events. Moreover, lower-income spouses have been reported to have poorer mental health (e.g., neuroticism and depression; Hammen, 2005; Lewis et al., 1998); and several recent studies have documented that the unique stressors faced by lower-income couples limit their capacity to communicate effectively (e.g., Williamson, Karney, & Bradbury, 2013). When considered as a system, it is understandable why lower-income couples are at a disadvantage with respect to maintaining a satisfying relationship in the face of stress and limited economic means.

With respect to social resources, research on marriage and families has suggested that the social environment of a couple is also critical to understanding marital success (Wilson, 2009). A couple's social capital, as it is often referred, can include the number, quality, and proximity of supportive social network members and the connections among those network members, minus the costs of maintaining the network generally and specific requests for time, effort, or money required by social network members directly. Having more positive social resources can

promote the continuation of a marriage and be particularly important when couples are under stress (Coleman, 1988). Indeed, social resources may be especially beneficial to vulnerable populations that are likely to rely on their social networks to compensate for economic disadvantage. By offering a couple aid, social networks can help couples work through their problems when they arise (Julien, Markman, Léveillé, Chartrand, & Begin, 1994; Milardo & Lewis, 1985) and help couples develop a stress-reducing marriage-promoting environment.

To elaborate and expand on existing models of marriage, this dissertation assembles four completed papers that examine how financial and social capital impact the development of marital satisfaction in newlywed couples. In pursuit of this goal, the first two papers examine financial capital, and the second two examine social capital. Each is discussed in the following sections.

The Salience and Severity of Relationship Problems among Low-Income

The federal government has allocated hundreds of millions of dollars over the past 15 years toward the Healthy Marriage Initiative (HMI), a collection of policies and programs explicitly designed to strengthen marriages among low-income populations through education and relationship-skills training (Administration for Children and Families, 2012). Unfortunately, these interventions have had very little success at improving relationship outcomes in this population. One possibility for their lack of success is that eligible couples did not perceive a match between the program's goals and their own needs and therefore did not participate fully or did not have their specific problems addressed when they did participate. If there was indeed a gap between HMI programs and the needs of couples in the target population, this might be attributable to the fact that most research on the determinants of relationship functioning has

been conducted on middle-class samples (Karney & Bradbury, 1995), whereas basic research with low-income couples is sparse by comparison (Fein & Ooms, 2006). Developing policies that are responsive to the needs of, and attractive to, low-income couples requires, at minimum, descriptive data on the challenges those couples perceive in their own relationships. Thus, the goal of first paper was to conduct basic research on low-income couples to describe and document the problems lower-income couples face.

To address this goal, this paper examines the reported marital problems of 862 Black, White and Latino newlywed spouses (N=431 couples) recruited from low-income neighborhoods of Los Angeles. In the study, spouses were asked to 1) free list their three biggest sources of disagreement in the marriage, and 2) rate the severity of the problems appearing on a standard relationship problem inventory. Despite being asked to report about problems *within* their marriage, lower-income couples described a number of salient problems *external* to their marriage (i.e., finances, children). The results of this study suggest that developing programs to support low-income married couples should address not only internal relationship problems like communication (the focus of the current Healthy Marriage Initiative programs), but also couples' external stresses by providing assistance with childcare, finances, or job training, for example.

Household Income and Trajectories of Marital Satisfaction in Early Marriage

Given that the most salient problems of low-income couples are external demands on their marriage, we wanted to determine whether one of the most common external demands affect the trajectory of couples' relationships over time: limited income. Thus, the second paper examines whether couples' level of household income is associated with the trajectories of couples' marital satisfaction. Although prior research has documented that divorce rates are

higher within lower-income populations, it does not necessarily follow that lower-income couples will also have less satisfying marriages. In fact, studies finding positive associations between financial capital and marital satisfaction have been limited by examining perceptions of financial stress rather than objective measures of income (e.g., Conger et al., 1990). Thus, the aim of this second paper was to examine whether couples with different financial capital (defined as couples with household income above or below \$50,000 annually) have varying marital satisfaction trajectories. An explicit goal of this research is to extend prior work by examining not only the cross-sectional association between income and marital satisfaction, but also to evaluate the effect of income on various components of couples' marital satisfaction trajectories.

This paper makes use of the same sample of 431 newlywed couples examined in the first paper. We continued to follow these couples for a total of five assessments, each nine months apart, over the first four years of marriage. Using a novel quantitative methodology, results of this study indicate that lower-income couples do not differ from more affluent couples in fixed effect estimates of marital satisfaction. Specifically, lower-income couples do not have less satisfying marriages on average, nor does their satisfaction decline more steeply on average. Rather, our results suggest that there are only significant differences in the variance estimates of marital satisfaction across lower- and higher-income couples. Specifically, lower-income couples experience (1) significantly greater fluctuations in marital satisfaction between assessments, and (2) significantly more variability between husbands and wives. These findings suggest that efforts to support the marriages of lower-income couples should aim to stabilize couples' marriages, rather than aim to improve satisfaction alone. Moreover, these results suggest that programs should aim to pinpoint the specific times *when* the relationships of lower-income couples are vulnerable, as well as *for whom* interventions would be most beneficial. Our results

suggest that being low-income does not assure an unhappy or unstable marriage at all times and for all people.

The Ties that Bind or Break Marriage: The Effects of Social Networks on the Development of Marital Relationships

Married couples are embedded in a dense web of relationships. Research examining the role of these social networks in relationships has a long history spread across a number of disciplines that use different terminology, different theories, and different methods. In light of recent technologies and developments that allow us to study social networks in new ways, the goal of this third paper was to assemble and review existing theories and research from across these traditions that accounted for the numerous ways that social networks impact the lives of the couples embedded within them. These include: 1) the role of social support provided to and required by the network, 2) approval from network members, 3) quality interactions with network members that spillover into positive interactions between partners, 4) norms prescribed by the network, 5) available alternatives, and 6) constraint created by the structure of the network. An integrative framework is outlined that synthesizes how the composition and structure of couples' social networks impact relationship satisfaction trajectories and stability through these mechanisms. The paper also includes a quantitative review of the methods and findings of the 117 peer-reviewed relevant publications on this topic. This review reveals that although there have been substantial efforts to understand the effects of social network support and social network approval on relationship outcomes, much remains to be understood with respect to the quality of social network ties, social network structure, and network norms. Moreover, the review reveals that the prior research has been methodologically limited in a

number of important ways. We provide suggestions for improving research methodology, and highlight substantive areas of research that future research should address.

Early Courtship Experiences that Predict Newlywed's Marital Satisfaction Trajectories

Finally, the fourth paper is an empirical paper examining a slice of the social network issue. Knowing that social networks matter for the success or failure of marital relationships has important implications for the process of courtship. Because courtship is a time when partners spend learning about each other and building shared supportive social ties, we sought to determine whether any of the concrete aspects of courtship that facilitated these processes predicted subsequent marital outcomes. Specifically, we examined 1) where partners met their spouse, 2) how long they dated, 3) whether they were friends before dating and 4) whether partners cohabited before marriage.

To address whether the choices couples make during courtship predicted their post-marital satisfaction and stability, we drew upon data from four independent longitudinal studies of first-married newlywed couples who were assessed every six months over the first four years of their marriage (eight assessments). All four studies employed similar strategies for recruiting married couples and nearly identical procedures and assessments, but were collected over a decade from different regions of the United States. In each of the four studies, partners independently completed surveys and audio-recorded semi-structured interviews in which they described their early courtship experiences. At baseline and every subsequent semi-annual assessment, spouses were asked to report on their marital status and to complete measures of marital satisfaction.

Across studies, approximately one-half of couples met through a shared environment (e.g., work, school or church), one-third through a social network member, and the remaining through a chance encounter or dating service; couples knew each other about a year before dating, dated for 2 years, and were engaged for another year before marriage (for a total of 4 years of courtship on average); about one-half of couples were friends before marriage; and about one-half of couples cohabited prior to marriage. These aspects of courtship were independent of spouses' age, education, parental divorce, prior relationships, self-esteem and personality. Across all four studies, these courtship experiences did not significantly account for divorce, initial marital satisfaction, or slopes of satisfaction over the first four years of marriage. Thus, although folk wisdom and several theories of relationship development suggest that different courtship experiences have meaningful implications for subsequent marital success and failure, instead it appears that all roads were equally likely to lead to rome-ance.

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The Salience and Severity of Relationship Problems among Low-Income Couples

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Paper published in the *Journal of Family Psychology*

February 2016

Preparation of this report was supported by Research Grants HD053825 and HD061366 from the National Institute of Child Health and Human Development awarded to Benjamin R. Karney. We gratefully acknowledge the crucial assistance of Kelly Campbell, Elizabeth Glanzer, Maya Harel, Amber Piatt and Davina Simantob for their assistance in coding.

Abstract

Developing programs to support low-income married couples requires an accurate understanding of the challenges they face. To address this question, we assessed the salience and severity of relationship problems by asking 862 Black, White, and Latino newlywed spouses (N=431 couples) living in low-income neighborhoods to (a) free list their three biggest sources of disagreement in the marriage, and (b) rate the severity of the problems appearing on a standard relationship problem inventory. Comparing the two sources of information revealed that, although relational problems (e.g., communication and moods) were rated as severe on the inventory, challenges external to the relationship (e.g., children) were more salient in the free listing task. The pattern of results is robust across couples of varying race/ethnicity, parental status, and income levels. We conclude that efforts to strengthen marriages among low-income couples may be more effective if they address not only relational problems, but also couples' external stresses by providing assistance with childcare, finances, or job training.

KEYWORDS: Conflict; Family Policy; Low-Income Families; Qualitative Research; Welfare Reform

The Salience and Severity of Relationship Problems Among Low-Income Couples

Although maintaining a fulfilling marriage is challenging in all segments of society, it appears to be disproportionately challenging within low-income communities, where rates of divorce are nearly twice as high as in more affluent communities (Bramlett & Mosher, 2002; Raley & Bumpass, 2003). Recognizing the heightened vulnerability of low-income couples, and the severely negative consequences of divorce for low-income spouses and their children (e.g., poverty, mortality, lower education; see McLanahan & Sandefur, 1994; Rogers, 1995; Smock, Manning, & Gupta, 1999), the federal government has allocated hundreds of millions of dollars over the past 15 years toward the Healthy Marriage Initiative (HMI), a collection of policies and programs explicitly designed to strengthen marriages among low-income populations through education and relationship-skills training (Administration for Children and Families, 2012).

Evaluations of the HMI studies have recently concluded and the results have not been promising. The Building Strong Families (BSF) study, which used a sample of 5,102 couples to test skills-based relationship education programs for low-income unmarried expectant parents, had no effects on relationship satisfaction, relationship stability, or co-parenting when examined 36 months post-treatment (Wood, McConnell, Moore, Clarkwest, & Hsueh, 2012). A similar program aimed at low-income married parents (Supporting Healthy Marriages; SHM) used a sample of 6,298 couples to test the effectiveness of skills-based relationship education and found slightly better results; the intervention had a small but significant effect on relationship satisfaction at 30 months post-treatment, but it did not make couples more likely to stay married and did not improve parenting or co-parenting (Lundquist et al., 2014).

Why did these HMI programs have so little success at improving relationship outcomes, despite spending millions of dollars on interventions? One possibility is that eligible couples did

not perceive a match between the program's goals and their own needs and therefore did not participate fully or did not have their specific problems addressed when they did participate. Indeed, 45% of couples assigned to the treatment group in BSF never attended a group relationship education session (Wood, Moore, Clarkwest, & Killewald, 2014). Moreover, a meta-analytic evaluation of relationship education programs similarly suggested that these programs may be ineffective in low-income populations because "the curricula are less relevant to the daily challenges they face" (Hawkins & Erickson, 2015, p. 64). Previous research has demonstrated that couples seek help with their relationships based on how well the help matches their own perceptions of their relationship problems (Doss, Simpson, & Christensen, 2004). Moreover, to the extent that the type of help provided matches their needs and expectations, couples show greater persistence in continued help-seeking (Allgood & Crane, 1991) and better relationship outcomes (Crane, Griffin, & Hill, 1986). If there was indeed a gap between HMI programs and the needs of couples in the target population, this might be attributable to the fact that most research on the determinants of relationship functioning has been conducted on middle-class samples (Karney & Bradbury, 1995), whereas basic research with low-income couples is sparse by comparison (Fein & Ooms, 2006). Developing policies that are responsive to the needs of, and attractive to, low-income couples requires, at minimum, descriptive data on the challenges those couples perceive in their own relationships. The current study seeks to address this question by assessing the salience and severity of relationship problems among 431 Black, White, and Latino newlywed couples living in low-income neighborhoods.

What marital problems are low-income couples likely to face?

When asked to rate the challenges they face in their marriages, middle-class couples typically highlight difficulties with communication and intimacy. For example, when divorcing

couples are asked to indicate the problems that led to their divorce, communication is the most cited problem, followed by general unhappiness and incompatibility (e.g., Cleek & Pearson, 1985). Couple therapists asked about the problems most often reported by their clients (likely to be more affluent couples who can afford therapy) also cite spousal communication as the leading challenge (Geiss & O'Leary, 1981).

Yet there are strong reasons to expect that lower-income couples may experience a different range of relationship problems than those faced by more affluent couples. Several theoretical perspectives converge to suggest that, in contexts where chronic stress is high, couples' concerns about resources will take precedence over their concerns about emotional fulfillment. Maslow's (1943) "hierarchy of needs" is the classic expression of this idea, predicting that before individuals can devote attention toward higher-order needs such as intimacy and emotional fulfillment, they must address basic needs, such as money, food, and housing. For low-income couples whose basic needs are not easily or predictably met, relationship problems related to income and employment may attract more attention than challenges related to maintaining or improving emotional connections. Elaborating on the premise that a family's level of stable resources affects their interpretation of and coping with specific stressors, Hill's Crisis Theory (1949) predicts that where resources are few (e.g., in low-income communities), stressors that may be minor annoyances in more affluent communities may be highly salient, and may therefore affect marriages in those communities disproportionately. Thus, although lower-income couples value having a healthy marriage as much as higher-income couples (Trail & Karney, 2012), the intrusion of external stressors into low-income couples' lives may draw focus away from concerns about the relationship, such as communication and intimacy, and toward concerns about financial and physical security.

Given that the explicit goals of Healthy Marriage Initiative programs were to support couples in low-income communities, one might expect that these predictions had been examined and that the needs of low-income couples had been thoroughly documented. On the contrary, few studies have assessed perceptions of relationship challenges within low-income communities. Those studies confirm that low-income individuals do perceive a wider array of relationship challenges than more affluent individuals. For example, ratings of the severity of relationship-specific issues like communication, sex, and being a parent do not differ significantly by income, but low-income individuals do rate money, drinking or drug use, being faithful, and friends as more difficult problems for their relationships than do more affluent respondents (Trail & Karney, 2012). Two studies of divorced individuals found that their reasons for divorcing differed by socioeconomic status, such that lower-SES individuals were more likely to attribute their divorce to issues such as abuse, financial problems, employment problems, and criminal activities, whereas higher-SES individuals were more likely to attribute their divorce to personality clashes, incompatibility, and lack of communication (Amato & Previti, 2003; Kitson 1992). Qualitative research on low-income, cohabiting couples in the Fragile Families study reached a similar conclusion, revealing that the majority of these couples experienced tensions over issues of housing, economics, employment, childcare, household chores, and personal issues such as drug and alcohol use (Waller, 2008).

Together, these results suggest that relationships in lower-income communities may face a greater array of relationship problems than relationships in more affluent communities. However it remains unclear whether this is specifically true of the young married couples that the Healthy Marriage Initiative programs were designed to support (Administration for Children and Families, 2012). Perhaps because rates of marriage are lower and rates of unmarried

parenthood are higher in low-income communities as compared to more affluent communities (Bramlett & Mosher, 2002; Pew Research Center, 2010), most research on perceptions of marriage in low-income communities has gathered data from unmarried couples, individuals in established relationships, or single parents (e.g, the Welfare, Children, and Families study; Fomby, Estacion, & Moffitt, 2003; the Fragile Families and Child Wellbeing study; Reichman, Teitler, Garfinkel, & McLanahan, 2001). Much of this work has described parenting and child outcomes (e.g., McLanahan, 2009) or obstacles to marriage and aspirations for marriage (e.g., Edin & Kefalas, 2005). Yet, despite the fact that current policies aim directly at promoting and improving marital relationships, the challenges faced by young couples in the early stages of marriage have yet to be studied within the low-income communities being targeted.

Do different groups of low-income couples experience different problems?

Although federal policies have targeted low-income communities containing wide diversity, there has been no attempt to date to identify whether the challenges reported by low-income couples differ across various demographic subgroups. Yet the same perspectives that highlight differences in the relationship problems likely to be reported *between* low-income and more affluent couples also predict differences *within* lower-income communities. Minority stress theory, for example, highlights the fact that members of stigmatized racial groups face chronically high levels of stress through repeated exposure to prejudice and discrimination (Meyer, 2003). To the extent that racial and ethnic minority couples are experiencing additional stress, their psychological and emotional resources may be even more limited compared to those of White couples in similarly low-income communities. Thus, relative to White couples, Latino and Black couples may be especially likely to identify external problems as more salient within their marriages as compared to relational problems.

The same reasoning suggests that other sub-populations within lower-income communities facing particularly high levels of stress may similarly focus their attention toward relationship problems stemming from concrete stressors rather than relationship-specific stressors like communication. Two of these subgroups are couples with children and couples who are especially poor. Just as minority couples experience additional stress through experiences of discrimination, so too do couples experience additional stress in raising children (Cowan & Cowan, 1992; 2014) and in living in poverty (Heymann, 2000). Therefore, relative to non-parents or more financially secure couples within the same communities, parents and poorer couples may view concrete stressors (e.g., childcare, work, or financial pressures) as more salient relationship problems than emotional issues. Investigating these possible differences is important, as policies and programs implemented in low-income communities will be most effective when they are informed by data on the unique challenges perceived by members of the communities they target.

Do standard assessments of problem severity identify the problems that are most salient to low-income couples?

To study the needs and challenges of low-income couples, prior research has typically borrowed tools from similar research on other populations. For example, researchers have used ratings of standard lists of relationship problems to assess how couples evaluate the severity of each potential problem on the list. Such lists can be useful tools, but only when the content of the list addresses the domain of salient problems that the population being studied is actually facing. Unfortunately, the relevance of most current lists of relationship problems to the lives of low-income couples has not been established. For example, one influential list (Geiss & O'Leary, 1981) was developed through interviews with couples therapists, who presumably serve a mostly

affluent, well-educated population. Research that relies exclusively on preexisting lists of challenges such as this therefore may overlook issues that are unique to low-income couples.

An alternative approach is a free-listing task that allows participants to nominate the problems that are the most salient or pressing for them, without imposing a predetermined set of responses (Thompson & Juan, 2006). This technique can be as reliable and valid as fixed-response techniques (Krosnick, 1999) and is capable of uncovering issues that are important to respondents that may not be included on fixed-response inventories (Schuman, Ludwig, & Krosnick, 1986). Research in other fields suggests that responses to open-ended questions are as good as or better than responses to survey questions at predicting a number of important outcomes, including candidate approval ratings and voting behavior (Bratton, 1994), attitude expression, financial contributions, and group meeting attendance (Miller, Krosnick & Fabrigar, 2014). Moreover, responses to a fixed- vs. open-ended question may reflect different information. Indeed, research on political attitudes reveals that the issues that voters recognize as important in fixed-response questions are not always the ones that they spontaneously report when asked to recall issues that are important to them using open-ended prompts (e.g., RePass, 1971; Schuman & Scott, 1987). These differences suggest that to understand the challenges that low-income couples perceive as relevant to their own relationships, free-listing techniques are an important complement to standard survey questions. To date, we are aware of no research that has collected and compared responses to both types of questions within a single study.

The current study

In an effort to align future efforts to strengthen marriage in low-income communities with the needs of couples in those communities, the current study aims to 1) describe the challenges that low-income couples perceive at the beginning of their marriages, 2) compare and

contrast the problems couples report across two different methodologies; a problem inventory and a free-listing task, and 3) determine whether the most salient and severe problems differ across racial/ethnic groups, between parents and non-parents, and at different levels of income. To address these goals, we asked newlywed couples living in low-income communities to free-list the biggest sources of disagreement in their marriages and then, on a standard list of relationship problems, to rate the severity of potential areas of disagreement. Newlyweds are an appropriate sample in which to address these goals, for several reasons. First, even in more affluent communities, the first years of marriage are a period of elevated risk for declines in marital satisfaction (Johnson et al., 2005), suggesting that the challenges couples face during this period are particularly important for the future of the relationship. Second, younger couples (i.e., of childbearing age) are the explicit targets of federal policies and programs (Ooms, Bouchet, & Parke, 2004). Third, restricting the sample to couples at a similar early stage of development ensures that the sample does not exclude the most vulnerable couples, who might dissolve and therefore be absent from populations of more established relationships (Karney & Bradbury, 1995). Drawing upon existing theories of family stress, we predicted that low-income couples would be significantly more likely to consider their external stressors as salient than relationship-specific stressors, such as communication.

METHOD

Sampling

Our sampling procedure was designed to yield a sample of first-married newlywed couples living in low-income communities. To accomplish this, participants were recruited from Los Angeles County, a region with a large and diverse low-income population. Recently married couples were identified through names and addresses provided on marriage license applications

in 2009. These addresses were matched with census data to identify applicants who resided in low-income communities, defined as census block groups wherein the median household income was no more than 200% of the 1999 federal poverty level for a four person family (a similar definition has been used in analyses of the National Survey of Family Growth; e.g., Bramlett & Mosher, 2002). Next, names on the licenses were weighted using data from a recently developed Bayesian Census Surname Combination (BCSC; Elliott et al., 2013), which integrates census and surname information to produce a multinomial probability of membership in each of five racial/ethnic categories (Latino, Black, Asian, White, or other) based on residential address and surname. Couples were selected from the total population of recently married couples using probabilities proportionate to the ratio of target prevalence to the population prevalence, weighted by the couple's average estimated probability of being Latino, Black, or White. These couples were contacted by phone and screened to ensure that they had actually married, that neither partner had been previously married, and that both spouses identified either as Latino, Black, or White. A total of 3,793 couples were contacted through the addresses they listed on their marriage licenses, and offered the opportunity to participate in a longitudinal study of newlywed development. Of the 3,793 couples contacted, 2,049 could not be reached and 1,522 responded to the mailing and agreed to be screened for eligibility. Of those, 824 couples were screened as eligible, and 658 of them agreed to participate in the study, with 431 couples actually completing the study.

Participants

Of the 431 recently married, heterosexual couples that participated in the study, 76% self-identified as Latino, 12% as Black, and 12% as White. The proportions of each group in the sample roughly matched the proportion of each group living in low-income neighborhoods in

Los Angeles (i.e., 60.5% Latino, 12.9% Black, and 14.7% White; U.S. Census Bureau, 2002). Of the Latino sample, the majority of respondents were U.S. citizens (70.3% of wives, 63.9% of husbands), and most were maternal first-generation Americans (92.1% of wives' mothers and 92.7% of husbands' mothers were born outside of the US). The vast majority of White and Black respondents were born in the United States (90.0% of White wives, and 94.0% of White husbands; 96.1% of Black wives, and 96.1% of Black husbands). The mean length of marriage across couples was 4.9 months ($SD = 2.5$) at the time of data collection. Wives' mean age was 26.2 years ($SD = 5.0$), and husbands' mean age was 27.9 years ($SD = 5.8$). White wives were significantly older than Black and Latino wives ($M_s = 29.6, 26.9,$ and 25.6 years, respectively), and White husbands were significantly older than Black and Latino husbands ($M_s = 31.3, 28.7,$ and 27.3 , respectively).

Wives had a mean income of \$25,944 ($SD = \$24,121$) and husbands had a mean income of \$33,379 ($SD = \$26,740$). As expected, White wives and husbands had significantly higher incomes ($M_s = \$47,082$ and $\$62,020$, respectively) than did Black wives and husbands ($M_s = \$28,869$ and $\$29,241$, respectively) or Latino wives and husbands ($M_s = \$22,027$ and $\$29,410$, respectively). Overall, 166 (38.5%) couples had at least one biological child in the household (6.0% of White couples, 52.9% of Black couples, and 41.2% of Latino couples), with 66 couples (15%) having more than one child.

Procedure

Couples were visited in their homes by two trained interviewers. Study procedures were fully explained and informed consent was obtained from each spouse. Husbands and wives were then taken to separate areas (either inside or outside the house) and interviewed one-on-one. All interviewers were fluent Spanish and English speakers, and interviews with Latino respondents

were conducted in Spanish (19%), English (63%), or a mix of Spanish and English (18%). The interview encompassed a wide range of topics, including detailed demographics, relationship experiences, and physical health. Respondents gave their answers to questions verbally, and interviewers either recorded their responses numerically for fixed-response items or transcribed their responses for open-ended and free-response items. Upon completion of the home visit, couples were debriefed and compensated in cash for their time. Data for the current analysis makes use of responses collected at the baseline assessment only.

Measures

Problem Salience. We assessed respondents' free-response description of the problems in their relationship with their spouse by asking: "All couples experience some difficulties or differences of opinion in their marriage, even if they are only very minor ones. What are the three biggest sources of disagreement between you and [spouse's name]?" If respondents had difficulty coming up with responses, the interviewer probed them by asking: "If you had to pick one thing that you don't see eye to eye on, what would it be?"

Problem Severity Scale. Participants then completed a version of the Relationship Problems Inventory (RPI; Geiss & O'Leary, 1981). This scale consisted of 22 items, and respondents were asked to "rate how much [each] issue is a source of difficulty or disagreement for you and your spouse, on a scale from 0 to 10." Respondents were told that items rated toward the low end of the scale (0-2) should be "issues that rarely if ever raise conflict or disagreement," and items rated toward the high end of the scale (8-10) should be "issues that raise frequent or intense conflict or disagreements" in the relationship.

Coding Procedures and Reliability Measures

We developed coding categories for the transcribed responses to the free-response items using standard procedures for coding open-ended survey questions (Ryan & Bernard, 2003). The goal of this procedure was to develop a comprehensive set of categories that would accurately describe responses to each item without being overly general or overly specific in their scope. In the first step of this process, a sample of the responses to a free-response item was given to four trained coders. Each coder read through the sample responses and independently developed a set of categories to capture the content of the responses to the question. The four coders then met with the researchers and discussed the categories that they had generated. This discussion yielded a set of categories that were agreed upon by all coders. In the next step, two of the coders independently assigned each response to one of the topic categories. At least one of the two coders was fluent in Spanish per pair. The coders then met with the researchers and discussed any uncertainties about the codes in an iterative process, with coders sorting and categorizing all responses to one free-response question before moving on to the next question. Inter-coder reliability was calculated two ways: A simple percent agreement score and a kappa score. Reliability was adequate, with 85.8% agreement between coders and a kappa of .85. Discrepancies between codes assigned to a response were resolved by randomly choosing one of the two codes.

Analysis Strategy

The primary goal of this study was to explore the spontaneous responses that couples gave to open-ended questions about their relationships and to compare those responses to a standardized closed-ended measure of problem severity, measured using the RPI. Thus, we sought to quantify what immediately came to respondents' minds when asked about different aspects of their spouse and their experiences in the relationship. In order to accomplish this, we

subjected the sample's coded responses to a salience analysis using Visual Anthropac 1.5 (Borgatti, 2003) software. Salience analyses are used to uncover the words or issues that are significant to people within a specific domain (e.g., relationship problems; Thompson & Juan, 2006). This technique uncovers the scope of issues within a particular domain and how salient each issue is for that group of people. Previous research has shown that the most salient items will be named by most people in the sample and those items will appear earlier in individual's lists (Bousfield & Barclay, 1950; Friendly, 1977). Here we calculate salience using Sutrop's salience index $S = F/(N \cdot mP)$, where F is the frequency that each item was mentioned across participants, N the number of subjects (in this case 431 each for husband and wife analyses) and mP is the mean position, or average ranking of each item (i.e., whether it was mentioned first, second, or third; Sutrop, 2001). Using this index, an issue that was mentioned by only a few participants, but usually mentioned first when it was mentioned, would receive a higher salience score than would an issue that was infrequently mentioned and was listed second or third on average when it appeared. These aggregated sample salience scores were then compared to the mean ratings of problem severity for each item in the RPI.

Follow up analyses were conducted to determine whether there were any individual influences on salience and severity. Because salience analyses result in only group-level statistics, we analyzed individual influences on responses through logistic regression using SAS (Statistical Analysis Software) 9.3. For each of the top 10 salience categories across the sample, we created a binary variable indicating whether or not the respondent included the category in their list of salient problems. This analysis allowed us to estimate the relationship between individual characteristics (i.e., household income, parental status and race/ethnicity) and problem salience. To evaluate individual influences on problem severity, we conducted regression using

SAS 9.3 predicting an individual's severity score from 0 to 10 (for each of the top 10 salient issues) from the same individual characteristics. All analyses were conducted separately for husbands and wives and used Bonferroni-corrected alpha values ($p = .05/40 = .001$ for analyses of race, and $p = .05/20 = .0025$ for analyses of income and parental status) to ensure we made conservative estimates of effects across the large number of moderation tests conducted.

RESULTS

Comparing Open-Ended Responses to RPI Items

To identify whether standard marital problem inventories sample the content domains most salient to couples in low-income communities, we compared the marital problems featured on the RPI to the categories that emerged from coding spouses' free listing of their marital problems. The majority of items from the version of the RPI used in the current study mapped directly onto categories of problems that emerged from spouses' free-listing of their top marital problems. However, three categories that emerged as salient problems for spouses did not match items included on the RPI. The first of these categories was *support*, i.e., respondents asking for too much or not getting enough support from their spouse. Examples included: "I'm always exhausted and he wants me to attend to him" and "He doesn't defend or stand up for me as he should." The second was *health*, i.e., tensions over issues related to physical well-being. Examples included: "My weight—I weigh too much," and "I always have conflicts with her about her not eating well." The third was *living situation*, i.e., housing issues such as "Household - she wants her own house (not my parents house)," and "Living situation- we don't have the resources." Together, these three categories may be issues that are especially salient to low-income populations, but less so to the moderate or high-income couples who originally generated the topics on the RPI and related problem inventories. For all other categories of marital

problems, the RPI inventory included the issues that emerged as salient to newlyweds in low-income communities.

Comparing Severity Ratings and Salience Scores

Although a standard problem inventory like the RPI appears to address most of the domains of salient marital problems for couples in low-income communities adequately, it does not necessarily follow that problem severity as assessed by inventories provides the same picture as problem salience as assessed by free listing tasks. To evaluate this question, we first conducted Pearson correlations between the two methods, separately for husbands and for wives, to determine whether the standardized salience scores for each marital problem category derived from the free listing task (see Figure 1A) were correlated with the standardized severity ratings of each problem on the RPI (see Figure 1B). We then compared the problems reported by husbands and wives to determine the level of agreement across spouses. Finally, we compared and contrasted the rankings of specific problems across these two methodologies.

The Pearson correlations reveal small non-significant correlations between the standardized problem salience and standardized problem severity scores for both husbands $r(19) = .38, p = .10$, and for wives $r(19) = .41, p = .08$. In studies of social psychological phenomena, correlations between .3 and .5 are considered medium-sized effects (Cohen, 1992). However, these are guidelines provided for evaluating the associations between distinct psychological and behavioral phenomena. Given that the free-listing problem task and the problem inventory essentially ask the same question in two different ways, we should expect significantly higher correlations comparable to those found in reliability analyses (i.e., those higher than .7 or .8). In fact, the shared variance across these measures is only $r^2 = 14\%$ for husbands and $r^2 = 17\%$ for wives, both of which are not significantly different from zero. This suggests that the free-listing

task and the problem inventory are in fact distinct measures of couples' problems, with each revealing unique information about the experiences of low-income couples.

Comparing across husbands' and wives' reports indicates that there is little agreement between partners in their own problems, but high agreement in the problems faced by low-income couples generally. Husbands' and wives' severity rankings had small correlations ranging from $r(431) = .10 - .43, p < .01$ across the 28 problems in the RPI. With the free-listing task, there is a similar pattern of discordance. Only 2% of couples in the sample agreed on their top 3 relationship problems, 31% agreed on at least 2 out of 3, and 81% agreed on at least 1 of 3. However, correlations of the salience and severity of problems between husbands and wives reports' across the whole sample reveal significantly high correspondence in which problems were reported as salient $r(19) = .97, p < .001$, and those rated as severe $r(19) = .97, p < .001$. Thus, although spouses frequently disagree about the problems they face within their own marriage, they do agree about the central issues across all marriages.

Comparing the two panels of Figure 1 reveals that, for most problems and problem categories, marital problems rated as above average in severity were also marital problems that were above average in salience for both husbands and wives. Among these newlywed couples living in low-income communities, the following three marital problems were above average in salience and severity: *management of money* (e.g., "Paying bills" or "Not having enough money for the baby and to go out"), *household chores* (e.g., "She feels like I don't do enough household chores, and she doesn't like the way I do them"), and *in-laws* (e.g., "She never wants to see my family" or "Helping the extended family too much").

Yet despite some correspondence between the two kinds of ratings, the salience and severity ratings did not correspond for four problems. Two marital problems emerged as above

average in severity for this sample, but below average in salience. Consistent with our predictions, couples in low-income communities rated *moods and tempers* (e.g., “I get mad too quick”; “I tell her she is too moody”; “She gets frustrated too easily”) and *communication* (e.g., “I don't like the way he talks to me sometimes”) as above average in severity when rating the problem on the RPI, yet these same issues emerged as below average in salience on the free listing task. The difference in ratings of *moods and tempers* was especially striking: on average husbands and wives rated this problem as more severe than any other problem on the list, yet when asked to generate their biggest problems, it did not appear among the top ten most-frequently mentioned issues. In other words, although these relational challenges are recognized as serious problems when spouses are reminded of them, they are not problems that couples in low-income communities spontaneously retrieve when thinking about the problems in their marriages.

In contrast, two problems that were above average in salience within this sample were rated as below average in severity. Again consistent with our predictions, couples in low-income communities rated *children* (e.g., “We disagree on how many kids we want to have”; “We disagree on how to reprimand the kids”) and *decisions about leisure time* (e.g., “He spends too much time online”) as above average in salience, even though the same issues were rated as below average in problem severity. Here, the difference in the ranking of children as a relationship problem was especially striking: when presented on a list, children was rated as one of the least severe problems that couples disagree about, but when asked about their biggest disagreements, children was one of the most frequently mentioned topics. Together, this pattern suggests that the marital problems that come to mind most readily for couples in low-income communities are not always the problems that they experience as most severe.

Moderation in Problem Salience and Severity

The couples in this sample varied widely in race/ethnicity, parental status, and income. We hypothesized that each of these variables might moderate the sorts of problems that couples experienced as most severe and most salient. To evaluate this possibility, we conducted two sets of analyses to look for moderation by key variables that signal stress or disadvantage. Results of these tests revealed that the ranking of problem severity and salience was generally robust throughout the sample, with only a few exceptions.

Race/Ethnicity. Using White couples as a reference group, Black and Latino couples did not significantly differ from White couples in their problems in all 40 of the 40 comparisons made for problem salience and in 38 of the 40 comparisons for problem severity. However, Latino and Black husbands were less likely than White husbands to rate problems with *work* as severe (for Latino husbands: $b = -1.73$, $SE = 0.46$, $p < .001$, for Black husbands: $b = -2.13$, $SE = 0.59$, $p < .001$) after controlling for parental status and income.

Parental Status. Controlling for race/ethnicity and income, analyses of moderation by parental status failed to reach significance in 18 of the 20 comparisons for problem salience and in 18 of the 20 comparisons for problem severity. Not surprisingly, parents in the sample listed problems with *children* as more salient (for husbands: $OR = 6.74$, $p < .001$; for wives: $OR = 7.82$, $p < .001$) and as more severe (for husbands: $b = 0.73$, $SE = 0.23$, $p < .001$; for wives: $b = 0.96$, $SE = 0.25$, $p < .001$) than non-parents.

Income. Controlling for race/ethnicity and parental status, analyses of moderation by household income failed to reach significance in 19 of the 20 comparisons for problem salience and in all 20 of the 20 comparisons for problem severity. Wives with lower household income

were less likely than their more affluent peers to rate problems with *household chores* as salient ($OR = 0.65, p < .001$).

DISCUSSION

Over the past decade, the federal government has allocated hundreds of millions of dollars towards programs designed to promote and strengthen marriage in low-income communities. Despite this considerable investment, recent evaluations reveal that the existing programs have had a negligible impact (e.g., Wood et al., 2014). Understanding why these programs failed requires, at minimum, basic research documenting the specific challenges that low-income couples face in maintaining successful relationships, but to date such research has been sparse. To address this gap in the literature and to inform the next generation of interventions to support low-income couples, the current study used open-ended and fixed-response measures to examine the salience and severity of relationship problems in 431 Black, White and Latino newlywed couples living in low-income neighborhoods.

When responses to the two approaches to assessing low-income spouses' perceptions of their relationship problems were standardized and presented side-by-side, the results revealed considerable overlap in content within the lists broadly, yet the rankings of different problems were uncorrelated across the two lists. Three problems emerged as above average on both lists: management of money, household chores, and in-laws. Consistent with predictions, when spouses living in low-income communities were asked to describe the biggest sources of disagreement *in* their relationship, the sources of those disagreements seem to reflect specific aspects of life *outside* of their relationship. This generalization held true for husbands and for wives, and regardless of whether we examined problem severity or problem salience.

Some relationship problems were ranked differently depending on how problems were assessed, and these differences highlight the value of combining both open-ended and fixed-response questions in a single study. For example, an exclusive reliance on severity ratings would suggest that moods and communication were among the most important and challenging problems that low-income couples face, and would support the relational focus of current interventions aimed at this population. Yet these were not the problems that most low-income couples spontaneously generated when asked to consider the problems in their marriages. The issue of moods and tempers, in particular, was far below average in salience when assessed in the open-ended task, despite being rated the most severe problem when it appeared on the fixed-response list. One explanation for the difference may be that free-listing tasks and problem-rating tasks invoke cognitive processes at different levels of abstraction (Schuman et al., 1986). Several of the problems listed on the RPI are quite broad (e.g., moods and tempers, communication, personality). These categories ask spouses to retrieve their own examples from memory, and the breadth of the category means that most spouses will be able to find relevant examples when asked to do so. Thus, a problem like moods and tempers may be rated as more severe than other problems on the list because many common negative experiences within a marriage may be seen as an example of that problem, whereas the experiences relevant to a concrete problem, like drug use for example, are more infrequent. In contrast, when asked to generate their own problems, spouses appear to have gravitated toward more concrete issues.

What were those more concrete issues raised in the open-ended task? Many of the most salient marital problems generated by spouses overlapped with the problems rated as most severe on the RPI, suggesting that, in general, standard lists of marital problems do address the relevant domains of marital problems for a wide range of couples. But several problems that emerged as

salient on the free-listing task were not represented or rated highly on the marital problem inventory used here, and these issues tended to stem from stress outside of the relationship. For example, coders recognized within the free-listing responses three issues that do not appear on standard lists of relationship problems: support, health, and living situation. In addition, issues regarding children and decisions about leisure time emerged as above average in salience, even though both issues were rated as below average in problem severity. Together these problems reflect the challenges that arise within the relationship when couples face challenges outside their relationship, like competing demands (e.g., children, health issues, or an unsatisfying living situation) or constraints on their time together. These issues, highlighted within responses to the free-listing task, are underemphasized or missed entirely by exclusive reliance on problem inventories. However when combined with the fixed-responses, these open-ended reports can yield a better understanding of the complex nature of couples' relationship problems, a phenomenon other family researchers have also documented (see Clark, Huddleston-Casas, Churchill, Green, & Garrett, 2008 for a review).

We also predicted that this pattern of results might differ across subgroups facing varying levels of stress and greater demands on their relationships (e.g., minority vs. white couples, parents vs. non-parents, and especially poor couples vs. couples who were more secure financially). Analyses that examined how each of these dimensions moderated spouses' perceptions of their marital problems did not support this view. Instead, the ratings and rankings of most marital problems were, for the most part, not significantly moderated by minority group status, parenthood, or household income. The results of these moderation analyses instead support the view that the problems low-income populations face tend to be robust across subsets of the population regardless of the additional stressors they may face individually.

Strengths and Limitations

A number of strengths in the methodology and design of this study enhance confidence in the results. First, our sampling strategy yielded a sample that was large and relatively homogeneous on age, length of marriage (i.e., newlyweds within nine months of marriage), and previous marital status (i.e., all spouses were in their first marriage). Thus, the results described here are unlikely to be confounded by unexamined sources of variance between couples. Second, we obtained data from husbands and wives, allowing us to ensure that the basic pattern of results described here was not idiosyncratic to one spouse. Third, this study is the first of which we are aware to obtain spouses' perceptions of their marital problems through open-ended and forced choice assessments, allowing us to evaluate the similarities and differences between these approaches directly.

Despite these strengths, several limitations of the study also suggest caution in drawing broad conclusions about the problems faced by couples in low-income communities. First, all the data described here were obtained through self-reports. To the extent that couples struggle with significant problems of which they are unaware or which they are unwilling to report, those problems would not be represented in these data. Second, although the sampling strategy yielded a diverse, low-income sample, it was not designed to yield a nationally representative sample. The sample was drawn from an urban environment (Los Angeles County), and it is possible that low-income couples from rural environments or other regions of the country face different problems. Third, although these findings may generalize to the young, first-married newlyweds that we sampled, cohabiting unmarried couples, older couples, remarried couples, or couples of longer marital duration may experience different problems as more or less salient or severe. Finally, with regard to the free-listing task, we asked respondents to list their three biggest

sources of disagreements in their marriages, but it is possible that a longer or more detailed free-listing assessment would have revealed additional issues.

Implications for Policy

Interventions aimed at low-income communities will be most effective to the extent that they address the problems perceived to be most salient to couples within those communities (Dion, 2005; Ooms et al., 2004). The results reported here suggest that the communication and conflict resolution problems identified in prior marital research on white, middle-class couples may not be the ones most relevant for the mostly minority, primarily lower-income couples targeted by federal policies. As other scholars have begun to argue (e.g., Johnson, 2012), this mismatch may account for the disappointing results of recent, expensive national interventions (Wood, Moore, Clarkwest, & Killewald, 2014). Relationship skills were the central focus of the interventions but not the most salient problems for couples within the population. When couples do not perceive that an offered intervention meets their needs, they are unlikely to make the effort to participate (Doss et al., 2004), and they may not benefit when they do (Crane et al., 1986).

Describing spouses' perceptions of their marital problems within low-income communities suggests an alternative direction for future efforts to promote and strengthen low-income families. To the extent that lower-income couples are more likely to view their problems as stemming from sources outside the relationship, future interventions should consider ways of addressing those external demands directly, in addition to current efforts to improve couples' marriages. Policies that promote the health and well-being of low-income couples (e.g., through offering childcare, healthcare, or job training) may benefit marriages indirectly but significantly (for an example of such a program, see Hardoy & Schøne, 2008). Some state programs are

already taking this approach, building job training, financial assistance, and financial advice and training into their marriage promotion programs (Ooms, et al., 2004). The current research suggests that these multimodal interventions, to the extent that they meet a perceived need, may be more effective and may have greater program uptake and persistence than programs that do not offer this assistance.

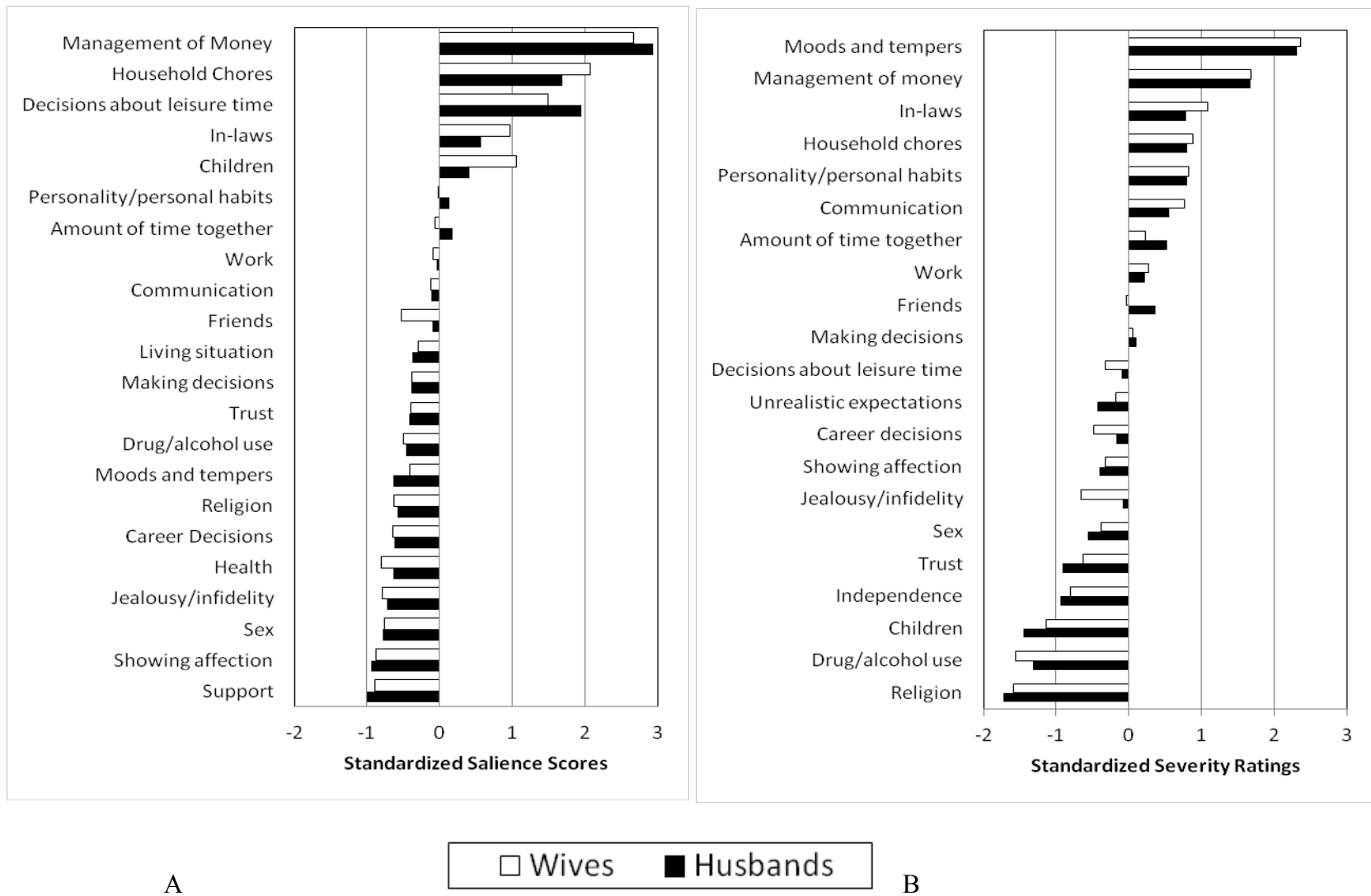


Figure 1. Standardized salience scores (A) and RPI ratings (B) for husbands and wives. In Figure 1A, higher numbers reflect greater salience, and in Figure 1B, higher numbers reflect greater severity rating

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Household Income and Trajectories of Marital Satisfaction in Early Marriage

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Paper submitted for publication in the *Journal of Marriage and Family*

February 2016

Preparation of this report was supported by Research Grants HD053825 and HD061366 from the National Institute of Child Health and Human Development awarded to Benjamin R. Karney.

Abstract

Are the marriages of lower-income couples less satisfying than the marriages of more affluent couples? To address this question, we compared trajectories of marital satisfaction among couples with a wide range of household incomes. The marital satisfaction of 862 Black, White, and Latino newlywed spouses (N=431 couples) was assessed five times, each nine months apart, over the first four years of marriage. Lower-income couples did not have less satisfying marriages on average, nor did their satisfaction decline more steeply on average. However, they did experience (1) significantly greater fluctuations in marital satisfaction across assessments, and (2) significantly more variability between husbands and wives. If efforts to support the marriages of low-income couples are to address the unique characteristics of their marital development, these findings suggest that efforts to stabilize their marriages may be more effective than efforts to improve their satisfaction alone.

KEYWORDS: Family Policy; Longitudinal; Low-Income Families; Marital Satisfaction; Welfare Reform

Household Income and Trajectories of Marital Satisfaction in Early Marriage

Although marital disruption touches all segments of society, its effects are disproportionately experienced by the economically disadvantaged (Bramlett & Mosher, 2002; Fein, 2004). For spouses in lower-income marriages, marital disruptions have been identified as a leading predictor of entry into poverty, especially for women (e.g., Haskins & Sawhill, 2003). For the children in these marriages, early exposure to marital disruption predicts later negative mental health symptoms and worse educational outcomes during adolescence (e.g., Spence, Najman, Bor, O'Callaghan, & Williams, 2002), which is especially noteworthy because lower-income marriages are likely to involve young children (Elwood & Jencks, 2004).

Observing the disproportionate risk for dissolution among lower-income marriages, many have assumed that marriages within lower-income populations are experienced as less satisfying as well. Indeed, this has been the guiding assumption of federal programs (e.g., the Healthy Marriage Initiative) aimed at strengthening marriages in low income communities (Administration for Children and Families, 2012). Yet to date, the empirical support for this assumption has been weak and inconsistent, primarily due to limitations in the samples addressed and the analytic methods employed. The primary goals of the current study were to overcome the limitations of prior research and evaluate the association between household income and marital satisfaction through longitudinal data from a diverse sample of newlywed couples.

Marital Satisfaction and Income

One framework for expecting lower-income marriages to be less satisfying is the Vulnerability-Stress-Adaptation (VSA) model (Karney & Bradbury, 1995), which identifies three categories of variables that may affect marital satisfaction and ultimately marital stability: enduring vulnerabilities (V), stressful contexts (S), and adaptive processes (A). Each of these

categories is likely to differ between lower- and higher-income couples in ways that might detract from lower-income couples' marriages. With respect to enduring vulnerabilities, lower-income spouses are more likely to have been exposed to physical and sexual abuse in childhood (Cherlin, Burton, Hurt, & Purvin, 2004) and have poorer mental health (e.g., neuroticism and depression; Hammen, 2005; Lewis et al., 1998). With respect to stressful contexts, lower-income marriages, by definition, develop within environments characterized by economic hardship, limited resources, and underemployment (Karney, Garvan, & Thomas, 2003; McLeod & Kessler, 1990). Lower-income neighborhoods are also likely to contain more evidence of social disorder (e.g., more crowded, noisier, and in poorer condition; Evans, 2004). With respect to adaptive processes, several recent studies have demonstrated that the unique stressors faced by lower-income couples limit their capacity to communicate effectively. Couples facing racial discrimination, for example, exhibit more verbal aggression toward their partner (Trail, Goff, Bradbury, & Karney, 2011), those living in low-income neighborhoods display less warmth to their partner (Cutrona et al., 2003), and those facing stressful events and financial strain exhibit greater observed levels of negativity and criticism toward their partner (Williamson, Karney, & Bradbury, 2013). When considered as a system, the enduring vulnerabilities, stressful contexts, and constrained adaptive processes of lower-income couples support the prediction that their marriages may be less satisfying than those of more affluent couples.

Review and Critique of Existing Literature

Despite reasons to expect that lower-income couples may have less satisfying marriages, research directly estimating associations between income and marital quality has been sparse. More common has been research linking marital quality to subjective assessments of financial strain, which have been consistently associated with lower marital satisfaction (e.g., Conger et

al., 1990). However, as noted in previous reviews (e.g., White & Rogers, 2000), subjective financial strain and marital satisfaction are both self-reported psychological constructs, so associations between experienced strain and experienced distress may be inflated by shared method variance (Lorenz, Conger, Simon, Whitbeck, & Elder, 1991).

Far fewer studies have evaluated whether concrete measures of household income account for variance in couples' marital satisfaction, and results of those studies have been mixed. A few studies have indicated that couples reporting higher household income also report higher marital quality. For example, in a study of 90 rural African American couples, higher per capita income was associated with greater marital satisfaction and lower marital conflict (Brody et al., 1994). Similarly, among 112 distressed couples receiving therapy, couples in the lower-income group reported significantly lower marital satisfaction than couples in the middle-income group (Dakin & Wampler, 2008).

In contrast, larger studies with more diverse samples report no association between assessments of household income and marital quality. In a nationally representative sample of over two thousand individuals in dating, cohabiting, and married relationships in Florida, Maisel and Karney (2012) reported non-significant associations between household income and marital quality. A similar study conducted in Germany with over three thousand participants found non-significant associations (Hardie, Geist, & Lucas, 2014). These patterns are also replicated in studies of African American marriages (Bowman & Forman, 1997; Clark-Nicolas & Gray-Little, 1991). Moreover, a study of 340 couples in Croatia reported non-significant direct correlations between income and marital quality, but did find that income had indirect associations with marital quality through subjective economic stress (Čudina-Obradović & Obradović, 2006).

There are several possible reasons why associations between household income and marital satisfaction have been hard to detect. First, many studies have sampled couples within a restricted range of income. For example, several studies only included lower-income samples (e.g., Brody et al., 1994; Clark-Nicolas & Gray-Little, 1991; Schramm & Harris, 2011), or only middle income samples (Vannoy & Cubbins, 2001). Examining variables with truncated ranges has long been shown to reduce the observed correlation between two variables (Pearson, 1903).

Second, most prior studies examining links between income and marital quality have sampled from populations of established married couples (Feng, Giarrusso, Bengtson, & Frye, 1999; Schramm & Harris, 2011), or couples already experiencing parenthood (Brody et al., 1994). Because marital quality declines significantly over the first years of marriage, and because divorce is most likely to occur within the first years of marriage (e.g., Kurdek, 1998), samples of established married couples are likely to exclude those who have already left the population through divorce or separation, i.e., those most at risk (Karney & Bradbury, 1995). Yet these couples may be the ones for whom income matters the most, as distressed lower-income couples may not have access to resources like marital therapy, vacations, or social support that could help them maintain intimacy in the face of stress.

Third, comparisons of marital satisfaction across couples at different levels of income often neglect to adjust for confounding differences between couples. For example, compared to higher-income couples, lower-income couples have fewer years of formal education and are more likely to have children prior to entering marriage (Elwood & Jencks, 2004). Each of these differences has implications for the expected marital satisfaction of a given couple: less educated husbands and wives are more likely to experience marital distress (Kurdek, 1991), and across the transition to parenthood, there are documented deleterious effects of having a child on a couple's

marital satisfaction (Doss, Rhoades, Stanley, & Markman, 2009). Without analyses that adjust for these variables directly, it is impossible to determine whether potential differences in the trajectories of marital satisfaction of lower and higher-income couples are correlates of these demographic differences or differences independently associated with income.

Implications of a Longitudinal Analysis of Marital Satisfaction

Understanding the potential impact of income on couples over time requires research that addresses marital satisfaction as it changes and develops over the course of the relationship. Indeed, within the broader literature on couples, many researchers have evaluated relationship satisfaction as a multifaceted outcome captured by two components: levels of satisfaction and slopes of satisfaction (see Karney & Bradbury, 1995 for a review), which together describe linear trajectories of satisfaction over time.

Associations between income and levels of satisfaction over time can be estimated as the *fixed intercept effect* of income on average levels of marital satisfaction across time. This is the component of marital satisfaction most regularly assessed in previous research on income and satisfaction, which allows researchers to ask: “Do couples at different levels of income tend to have different levels of marital satisfaction?”

Associations between income and linear changes in satisfaction over time can be estimated as the *fixed linear slope effect* of income on marital satisfaction. Analyzing this component allows researchers to ask the question: “Do couples at different levels of income have more or less difficulty in maintaining their marital satisfaction over time?” It is worth noting that only two studies we are aware of have evaluated the association between household income and slopes of satisfaction. Hardie et al. (2014) found non-significant associations between household income and satisfaction slopes. In contrast, Rogers and DeBoer (2001) found that increases in

wives' income was associated with positive changes in marital satisfaction over eight years, but no association was documented for husbands.

Yet these two fixed effects do not exhaust the ways that the trajectories of lower- and higher-income couples may differ from each other. In addition to these *fixed* effects on intercepts and slopes, three *random* effects may also distinguish between the marital quality trajectories of higher- and lower-income couples. For example, couples may differ in the *residual variability* in their satisfaction between time points. Assessing differences in residual variability across lower- and higher-income groups allows researchers to ask: "Do couples at different levels of income have more unstable or fluctuating relationship satisfaction over time?" Fluctuations in repeated measures of marital satisfaction are worth studying because, according to Kelley (1983), the experience of fluctuations in the quality of the relationship over time can lead to uncertainty about the relationship even during periods experienced as satisfying. Such uncertainty may eventually lead to less happy and less stable relationships. Indeed, in prior studies, greater residual variability has been associated with higher risk of relationship dissolution and lower relationship commitment, even after controlling for overall levels of relationship satisfaction (Arriaga, 2001; Campbell, Simpson, Boldry, & Rubin, 2010; Whitton, Rhoades, & Whisman, 2014). Compared to more affluent couples, lower-income couples experience greater exposure to acute stressors (McLeod & Kessler, 1990). The temporary declines in satisfaction associated with the onset and offset of acute stress (Karney, Story, & Bradbury, 2005) may predict greater fluctuations in their marital satisfaction, as illustrated in Figure 1A.

In addition to the fixed and random parameters that characterize individuals' trajectories, it is also possible to examine differences in variability among couples within lower- and higher-income groups. For example, we can evaluate whether there are group differences in *variability*

between partners within couples. This component allows researchers to ask: “Are the marital satisfaction ratings of husbands and wives more discordant within lower-income couples than within higher-income couples?” Given the increased time demands in resource-poor environments, lower-income couples may have less shared leisure time in which to develop a common understanding of their relationship (Gager & Sanchez, 2003), leading to more discordance between spouses’ ratings, as illustrated in Figure 1B.

Finally, we can also examine *variability between couples.* This allows us to ask, “Does marital satisfaction vary more among lower-income couples than among higher-income couples?” Because affluent couples have resources that can buffer them from crises, there may be fewer extremes of experience across higher-income couples. Lower-income couples who lack those protections may be more vulnerable (Shipler, 2008), and so may experience more extremes in their marital satisfaction, as illustrated in Figure 1C.

Overview of the Current Study

Given interest in low-income marriages from policy-makers and the limitations of prior research on the associations between income and marital satisfaction, the current study was designed to examine all of the ways that household income may be associated with trajectories of marital satisfaction among couples in their first years of marriage. Newlyweds are an appropriate sample in which to address these issues, for several reasons. First, even in more affluent communities, the early years of marriage are a period of elevated risk for declines in marital satisfaction (Johnson et al., 2005), suggesting that the challenges couples face during this period are particularly important for the future of the relationship. Second, younger couples (i.e., of childbearing age) are the explicit targets of federal policies and programs (Ooms, Bouchet, & Parke, 2004) and are still underrepresented in marital research (Fein, 2004). Third, examining

couples in the early years of marriage ensures that the sample does not exclude the most vulnerable couples, who might dissolve and therefore be absent from populations of more established relationships (Karney & Bradbury, 1995). Fourth, sampling couples who are homogenous in terms of marital duration and relationship stage reduces the likelihood that results are affected by unexamined confounds. To ensure that our sample contained a full range of income levels, we made a special effort to recruit from lower-income communities.

The current study makes use of five waves of data collected every nine months over the first four years of marriage. In this sample, we compared lower- and higher-income couples in terms of their divorce risk, as well as five unique dimensions of their marital satisfaction trajectories. Drawing upon the VSA model and prior research, we predicted that, compared to more affluent couples, lower-income couples would report their marriages to be less satisfying across time (a lower intercept), their satisfaction would decline more steeply over time (a more negative linear slope), their satisfaction would fluctuate more (greater residual variance), spouses' satisfaction would be more discordant within each couple (random individual within couple effect), and that there would be more variability among couples (random couple effect).

METHOD

Sampling

Newlywed couples were identified via marriage license records obtained from the Los Angeles County Recorder's Office in 2009. Using zip codes from marriage license databases, addresses from couples who had applied for marriage licenses were matched with census data to identify applications submitted from low-income neighborhoods. Low-income neighborhoods were identified as those with a median household income of no more than 200% of the federal poverty level for a four-person family. A similar method has been used previously (Bramlett &

Mosher, 2002), and is known to be more reliable than asking participants their income, as individuals can be reluctant to disclose this information.

Names on the marriage licenses were processed using a Bayesian Census Surname Combination (BCSC) developed by researchers at the RAND Corporation (Elliott et al., 2013). This algorithm integrates census and surname information to produce a multinomial likelihood of each individual falling within one of four racial categories: Black, Latino, Asian and White/Other. As part of a larger study on newlywed development, those couples identified as having a high probability of being Latino, Black or White were contacted for recruitment into the longitudinal study. Follow-up phone calls were made and those who were eligible and provided consent were included in the study. Eligibility criterion included: (a) first marriage for each partner, (b) married less than three months, (c) living together (i.e., the couple could not be temporarily separated, nor could either partner be deployed or incarcerated), (d) were more than eighteen years of age, (e) wives were less than 40 years of age (to allow for the transition to parenthood for all couples) and (f) both spouses self-identified as the same race.

Participants

Using these eligibility criteria, 332 Latino (77%), 51 Black (12%) and 50 White (12%) couples were recruited into the study for the baseline assessment (N=433 couples; 866 individuals). The proportions of each group in the sample roughly matched the proportion of each group living in low-income neighborhoods in Los Angeles (i.e., 60.5% Latino, 12.9% Black and 14.7% White; U.S. Census Bureau, 2002). The mean length of marriage at baseline was 4.8 months ($SD = 2.5$). Men's mean age was 27.9 years old ($SD = 5.8$) and women's mean age was 26.2 years old ($SD = 5.0$). Wives' and husbands' average self-reported joint household income

was \$57,000. By the end of the four-year study, fifty-five couples had divorced; thirty-nine Latino couples (12%), eleven Black couples (22%) and five White couples (10%).

Procedure

At baseline, couples were visited in their homes by two trained interviewers who described the IRB-approved study and obtained consent from each participant. Demographic information and a measure of marital satisfaction were collected at this time. Follow-up interviews were scheduled nine, eighteen and twenty-seven months after the baseline interview in their homes. A fifth interview was conducted thirty-six months after baseline over the phone. Relationship satisfaction and divorce status was measured at each of these time points. At the end of each phase of assessment, couples were debriefed and compensated for their time.

Measures

Household Income. Household income was collected at the baseline interview and at each follow-up assessment. Husbands and wives were independently asked “Thinking about your income and the income of everyone else in your household, what was your total household income from all sources before taxes in the past 12 months?” Participants were instructed to select one of the following categories $1 = \text{Under } \$5,000$, $2 = \$5,000 - \$9,999$ $3 = \$10,000 - \$14,999$... $21 = \text{Greater than } \$100,000$. Reported household-income remained stable over time, such that baseline and time 5 reports were significantly positively correlated ($r = .73$ for husbands, and $r = .69$ for wives). Thus, only baseline income was used as a predictor. Husbands’ and wives’ reports also correlated highly ($r = .72$), and were averaged to yield a couple-level household income variable. When data from one spouse was missing, the other spouse’s report was used for the couple. Five couples had missing data and are excluded from the analyses.

Household income ranged widely in the sample, such that some couples reported an annual household income less than \$5,000 annually, whereas others reported over \$100,000, with a median in the range of \$45,000 - \$50,000. This median household income is roughly equivalent to the national U.S. median household income of \$51,017 as of 2012, and slightly lower than that for California \$58,328 and Los Angeles \$57,271 (U.S. Census Bureau, 2013). Testing for differences in random effects across income required that we create distinct categories of income so that we could model heterogeneous variance structures using the GROUP= option in SAS PROC MIXED RANDOM and REPEATED statements. To accomplish this, couples with a reported household income less than or equal to \$50,000 annually were considered lower-income (N=208 couples), and those with an annual household income higher than \$50,000 annually were coded as higher-income (N=220 couples).

Other demographic information. Demographic data were collected at the baseline interview. Each participant's date of birth, level of education, immigration status and whether the couple had any children were all collected at this time. Age at the baseline interview was calculated from the self-reported birth date. Education was measured and recoded into four categories where 1 represented "less than high school," 2 for "a high school degree," 3 for "some college experience," and 4 for "a college degree or higher." Participants were also asked if they had United States citizenship. Those who self-identified as having only a green card, temporary visa, or neither were given a dummy code of 1 for "immigrant," whereas all U.S. citizens were given a code of 0 for "non-immigrant". To assess the presence of children, husbands' and wives were independently asked, "Who lives in your current household (besides the two of you)?" with one of the response options being "your (or your spouse's) children (include biological, adopted,

step and foster children).” If either the husband or wife reported children in the home, the couple was given a dummy code of 1 for “children present” or 0 for “no children present”.

Relationship Satisfaction. Relationship satisfaction was assessed by summing responses on an 8-item questionnaire. Five items asked how satisfied the respondent was with certain areas of their relationship (e.g., “satisfaction with the amount of time spent together”), and were scored on a 5-point scale (ranging from 1 = Very dissatisfied to 5 = Very satisfied). Three items asked the degree to which the participant agreed with a statement about their relationship, (e.g., “how much do you trust your partner”) and were scored on a 4-point scale (1= Not at all, 2 = Not that much, 3 = Somewhat, 4 = Completely). All eight items were summed so that scores could range from 8 to 37. Coefficient alphas from times 1 through 5 were .70, .75, .77, .79 and .78 for wives and .70, .78, .76, .83 and .81 for husbands.

Analytic Method and Rationale

The goal of the current paper was to examine whether trajectories of marital satisfaction and risk of divorce are associated with household income. To address this question, we extend cross-sectional dyadic methods developed by Blood, Kalish, and Shrier (2013) for longitudinal dyadic data using a mixed effects regression model that includes fixed effects and random effects at the level of the repeated observations (L1), nested within individuals (L2), nested within dyads (L3). This model can be represented by the following equation:

$$Y_{ipj} = \beta_0 + \beta_1 \text{Income}_j + \beta_2 \text{Time}_{ipj} + \beta_3 \text{Income} * \text{Time}_{ipj} + v_{1ip} + v_{2ip} + \omega_{1p} + \omega_{2p} + \varepsilon_{ipj} \quad (1)$$

where j indexes each unique observation nested within the i^{th} individual nested within the p^{th} dyad. In the analyses here, time represents the wave of assessment and is coded from 0 to 4 (so that the intercept represents initial marital satisfaction, and the Time_{ipj} effect represents the linear

slope effect on marital satisfaction between each nine-month wave). To determine if there are significant differences in the fixed effects of marital satisfaction trajectories across household income groups, we can look for significance in two places: intercepts and slopes. To identify household income differences in marital satisfaction intercepts, we look at the $\beta_1 \text{Income}_j$ parameter. To identify household income differences in slopes, we look at the $\beta_3 \text{Income} * \text{Time}_{ipj}$ parameter.

With respect to the random effects, v_{1ip} and ω_{1p} index random effects on the intercepts at the individual and dyad levels, v_{2ip} and ω_{2p} index random time slopes at the individual and dyad levels. We conducted a series of nested likelihood ratio tests to determine whether all of these random effects were necessary to model satisfaction trajectories in the current sample. Results of these tests confirmed that including all of these trajectory components were appropriate. Thus, in all analyses reported below, we report models with random effects for the residual (L1), random effects for the full trajectory (intercept variance, slope variance and the covariance between intercepts and slopes) at the individual level (L2), and dyad level (L3).

To determine if there are significant differences in the random effects of marital satisfaction trajectories across income groups, we ran an additional series of nested likelihood ratio tests to look for significant improvement in fit from homogeneous variance models (i.e., those estimating the same variance parameters for all couples) in comparison to heterogeneous variance models (i.e., those estimating separate variance parameters for couples in the lower- and higher-income groups). Results of these tests are presented in the following section.

RESULTS

Preliminary Analyses

To examine differences between the lower- and higher-household income groups on demographic variables at the baseline assessment, we conducted a series of Chi-square tests for dichotomous variables, and independent samples t-tests for continuous variables; results of these tests are presented in Table 1. The higher- and lower-income groups differed significantly on almost every demographic variable we measured. For example, couples in the lower-income group were significantly more likely to have children than those in the higher-income group. Latino couples were significantly over-represented in the lower-income group, White couples were significantly under-represented, and Black couples were equally likely to be in the lower- and higher-income groups. Both husbands and wives who were immigrants were significantly less likely to be in the lower-income group. The couples categorized as lower-income were also significantly younger and significantly less educated. All of these variables were included as covariates in subsequent analyses. It is worth noting, however, that inclusion or exclusion of these covariates did not change the significance or directions of our results.

Relationship Dissolution and Income

One preliminary goal was to replicate the well-established finding that lower-income couples experience greater rates of dissolution than higher-income couples. Indeed, lower-income couples were more likely to end their relationship, such that 19.8% of relationships dissolved in the lower-income group (n=32 couples), whereas only 13.2% of relationships dissolved in the higher-income group (n=23 couples). This difference was not statistically significant [$\chi^2(1) = 2.72, p = .11$]. However, these divorce rates are comparable to those reported from census data four years post-marriage of 17%, 11%, and 9% for lower-, middle-, and higher-income couples respectively (Bramlett & Mosher, 2002). Thus, the smaller sample size here, as

compared to census data, may account for the lack of significance. Further assessments may reveal greater deviations over time, as documented in Bramlett and Mosher (2002).

Determining a Best-Fitting Model for Random Effects

We conducted a series of nested likelihood ratio tests to determine whether differences in the variability of marital satisfaction trajectories existed across income groups at any combination of the three levels of nesting within the data (observation L1, individual L2 and dyad L3). All possible combinations were estimated, and results of these analyses confirm that the best-fitting model separately estimates variability of marital satisfaction between observations by income groups $\chi^2(1) = 10.5, p < .01$; variability of marital satisfaction between individuals within couples by income group $\chi^2(3) = 11.9, p < .01$; but not variability of marital satisfaction between couples by income group $\chi^2(3) = 1.7, p = .64$. Although results from the best-fitting model did not estimate separate dyad level parameters by income group, we present results from the full model estimating all of these components separately in Table 2. The direction and magnitude of all effects in the best fitting model are comparable to those presented in Table 2, and are available from the authors upon request.

Relationship Satisfaction Trajectory and Income – Fixed Effects

As presented in Table 2, lower- and higher-income couples did not significantly differ in their level of satisfaction at the beginning of their marriage [$\beta = -0.02, SE = 0.28, t(421) = -0.08, p = .94$]. Rather, both higher- and lower-income husbands and wives reported high initial marital satisfaction with averages at 34 out of a possible 37. However, as is true in nearly all longitudinal studies of marital satisfaction (e.g., Kurdek, 1998), there was a significant main effect of time, such that all couples experienced statistically significant declines in satisfaction across assessments [$\beta = -0.36, SE = 0.06, t(386) = -5.66, p < .001$]. These declines were relatively small

leading to an average decline of only 1.44 points over the first four years of marriage, and lower- and higher-income couples did not differ significantly in their rates of linear change in satisfaction over time [$\beta = -0.13$, $SE = 0.09$, $t(386) = -1.46$, $p = .15$]. Thus, most of the couples were relatively happy at the beginning, and despite statistically significant declines, maintained close to their initial level of happiness over four years, regardless of income.

To ensure that these estimates were not simply underpowered as a function of evaluating household income as a dichotomous variable, we conducted a follow-up analysis using the original continuous household income variable. This analysis confirmed that household income still did not moderate satisfaction intercepts [$\beta = -0.004$, $SE = 0.03$, $t(1865) = -0.17$, $p = .86$], nor slopes [$\beta = -0.01$, $SE = 0.01$, $t(1865) = -1.51$, $p = .13$].

Relationship Satisfaction Trajectory and Income – Random Effects

As reported earlier, the model that fit best indicated that there were significant differences by income group in variance of random effects at two of the three levels of the model. The first significant effect was a within-subjects effect, indicating that satisfaction varied between assessments nearly twenty percent more among individuals in the lower-income group compared to individuals in the higher-income group. The second significant effect indicated that there was greater variability in reported marital satisfaction trajectories between lower-income husbands and lower-income wives, than between higher-income husbands and higher-income wives. Specifically, lower-income husbands and wives intercepts varied between spouses within a couple over twice as much as compared to the intercepts of more affluent husbands and wives, who tended to be more similar to one another on average.

DISCUSSION

Lower-income couples are at substantially higher risk of divorce than higher-income couples (e.g., Bramlett & Mosher, 2002). Drawing upon this observation and strong predictions from family stress models (e.g., the VSA Model; Karney & Bradbury, 1995), policy-makers have assumed that the marriages of lower-income couples are also less satisfying, and have designed programs to strengthen lower-income families based on this assumption. However, the evidence to support this assumption has been mixed at best. Although a few studies have shown a positive association between marital quality and objective measures of income (e.g., Brody et al., 1994; Dakin & Wampler, 2008), most do not (e.g., Bowman & Forman, 1997; Clark-Nicolas & Gray-Little, 1991; Hardie et al., 2014; Maisel & Karney, 2012).

Consistent with the majority of prior research on these associations, lower-income couples in our sample were not any more or less satisfied with their marriages on average than higher-income couples, and on average their satisfaction remained as stable as that of more affluent couples over four years. In light of the good reasons to predict links between income and satisfaction, how can we understand the repeated failure to observe significant fixed effects of income on satisfaction? Some have argued that income contributes to well-being only to the extent that more money helps individuals meet basic needs (e.g., food, clothing, shelter) and avoid poverty (Diener & Biswas-Diener, 2002). Once basic needs are met, as was likely to be true for the working couples sampled here, additional income may not be associated with greater well-being, because the desire for material goods tends rise with income. The results of this and most prior studies are consistent with this perspective, and taken by themselves suggest that research on the sources of higher divorce rates among lower-income couples direct attention elsewhere.

Yet these analyses reveal that an exclusive focus on average trends can be misleading, obscuring real differences between higher- and lower-income couples that emerge only in the variability around the average for each group. The most noteworthy result of the analyses reported here is that, despite being just as satisfied with their marriages on average, lower-income couples experience significantly greater variability in their satisfaction between assessments, i.e., their satisfaction fluctuates more around the linear trend line, compared to more affluent couples. An implication of this difference is that lower-income couples may experience their relationships as more turbulent over time than comparable higher-income couples, even if they are just as satisfied on average. In his seminal theoretical work on close relationships, Kelley (1983) suggested that couples may attend to the stability and instability of their relationships separately from their sense of the average quality of the relationship. To the extent that couples experience periods of elation alternating with periods of frustration, they may question their security in the relationship even during good times, with negative consequences for commitment and satisfaction in the long run. Indeed, the few prior studies that have examined the implications of residual variance in partner's reports of relationship satisfaction have shown it to predict lower commitment and greater risk of dissolution, even after controlling for overall levels of relationship satisfaction (Arriaga, 2001; Campbell et al., 2010; Whitton et al., 2014). To understand the increased risk of dissolution of lower-income couples, then, it may not be sufficient to evaluate their overall marital quality, especially early in the relationship. These results suggest that the experience of frequent or regular low points in the marriage may be enough to harm the relationship, as these are the points when decisions to leave the relationship may be made.

In addition to greater variability in satisfaction *within* lower-income spouses over time, our analyses also revealed greater variability *between* lower-income spouses, i.e., the marital satisfaction of husbands and wives in lower income couples were more different from each other than the marital satisfaction scores of more affluent husbands and wives. This pattern of results may be attributed to the demands on lower-income individuals to work multiple jobs, or jobs with nonstandard hours that can prevent couples from sharing leisure time together (Presser & Cox, 1997). Without the opportunity to develop closeness, connection and a common understanding of their relationship through shared experiences (Gager & Sanchez, 2003), lower-income couples may be at greater risk of divorce if one spouse is happy and the other is not, even when on average lower-income couples are just as satisfied as more affluent couples.

Finally, although there was significant variability in both lower and higher income couples' marital satisfaction trajectories at the dyadic level, there was no significant difference in this variability across income groups. These findings suggest that there is a range of positive and negative experiences these couples face. For example, some lower income couples are quite satisfied and some lower income couples are not, just as some higher income couples are quite satisfied and some higher income couples are not. Therefore, the consequences of living in a resource-poor environment are not uniform for all lower-income couples, but neither are the benefits of living in resource-rich environment. A task for future research is to identify the characteristics of both lower and higher income couples that allow some to experience higher quality relationships. The VSA model (Karney & Bradbury, 1995) offers some guidance, proposing that the couples who adapt best to stressful environments should be those with the fewest enduring vulnerabilities, or the greatest personal strengths. Identifying specific sources of strength and vulnerability may help to target interventions more precisely to avoid devoting

limited resources toward couples whose relationships may be successful even without exposure to any intervention.

Strengths and Limitations

A number of strengths of the present study heighten confidence in these findings. First, whereas prior research on disadvantaged couples has examined perceptions of financial strain, here we included a concrete assessment of household income that is less likely to be biased by characteristics of spouses that may also be associated with their marital outcomes. Second, this is the first study of which we are aware that has studied associations between income and marital satisfaction among newlywed couples, all of whom were in their first marriages and all of whom lived in the same region of the country. The relative homogeneity of our sample minimizes the chances of confounds due to unexamined third variables, and makes this a more focused test of the associations between income and marital satisfaction than has been possible in other studies examining more diverse samples. Third, whereas most prior studies of these constructs have examined the link between income and satisfaction cross-sectionally, this is first to examine marital satisfaction trajectories using multi-wave longitudinal data, allowing us to identify differences between lower- and higher-income groups that other studies may have missed.

Yet despite these strengths, several aspects of this study also limit the conclusions that these results can support. First, all data in the present study was obtained through self-report. To the extent that couples are unable or unwilling to report their household income accurately, these results may be an imperfect estimate of the true associations between income and marital satisfaction. Second, all of the data analyzed here was correlational. We have taken care to describe our results in terms of associations, as these data cannot support causal statements about the impact of income on marriage. Third, although the relative homogeneity of the couples in

this sample strengthens the internal validity of this work, it limits our ability to generalize the conclusions of this research to other populations. The associations between income and marital satisfaction may differ among unmarried cohabiting couples, more established married couples, remarried couples, or couples from rural environments, other regions of the country, or other countries entirely. Moreover, the associations found here may change over time as couple's relationships progress. For example, although we did not document a significant fixed effect of income on marital satisfaction slopes over the first four years of marriage, it is possible that such an effect may emerge at greater marital durations. Fourth, we recognize that considering household income alone is an oversimplification of the economics of a given household; their assets, debts and financial strains may also interact with marital processes in unique ways. Fifth, although comparing groups in heterogeneous variance models required that we create distinct categories in the income variable (Blood et al., 2013), doing so also results in loss of information, diminished power, and smaller effect sizes (MacCallum, Zhang, Preacher, & Rucker, 2002). Confidence in these results would be strengthened by future research that replicated the patterns obtained here using other models.

Implications for Research and Policy

Considerable resources are currently being allocated for programs to prevent or alleviate marital dysfunction in lower-income populations. These resources will be spent most effectively to the extent that they are informed by an explicit understanding of how lower-income marriages develop over time. Each of the differences revealed by this comparison has implications for interventions.

To the extent that the average lower-income couple is just as satisfied as the average higher-income couple, then broad-spectrum efforts to make marriages better in lower-income

communities (the explicit goal of the Supporting Healthy Marriage project) may not be the most effective approach toward lowering the disproportionately high divorce rates in these communities. Instead, the greater variability experienced by lower-income couples highlights a need to pinpoint the specific times when their relationships of lower-income couples are vulnerable, to identify the sources of those periodic challenges, and to develop ways of assisting couples through those times. As far as understanding the causes of instability in lower-income marriages, previous research has demonstrated that lower-income couples' relationships are significantly more likely to face external acute stressors (i.e., financial or health problems, unstable employment; Jackson et al., 2015; Trail & Karney, 2012). Policies that protect couples from these stressors at a community level (i.e., offering local childcare, healthcare, or job training) may indirectly benefit marriages (for an example of such a program, see Hardoy & Schøne, 2008). Indeed, some state programs are taking this approach already (Ooms et al., 2004). In addition to promoting the stability of lower-income couples' environments, interventions might also teach couples how to identify and cope with stressful periods (for an example of such a program, see Bodenmann & Shantinath, 2004). Even if the stressor itself cannot be ameliorated, it may also be useful to teach couples how to recognize when stress is spilling over into the relationship, and encourage couples to reaffirm their partners and resist scrutinizing the relationship during these low points. Future research that identifies the circumstances surrounding couples' lowest points may help programs identify *when* interventions would be most beneficial.

To the extent that there is greater variability between lower-income spouses than between higher-income spouses, these findings also highlight the need to identify *for whom* interventions would be most beneficial. To date, government programs have targeted vulnerable couples on

the basis of a single dimension of vulnerability: being low-income. Our results suggest that being low-income does not assure an unhappy or unstable marriage. Indeed, even within the same marriage, spouses in lower-income communities often had differing reports of marital satisfaction. Efforts at secondary prevention that focus more precisely on specific vulnerabilities within lower-income populations, e.g., those who also face challenges with physical health, mental health, or employment, may result in larger effects on spouses that receive treatment, and less effort spent fruitlessly on those who would succeed even without interventions.

Table 1: Descriptive statistics and tests of differences by income group

	Lower-income Group	Higher-income Group	Test of Differences
	M (SD) or %	M (SD) or %	Between Income Groups
% Black	12.5	11.4	$\chi^2(1) = 0.13$
% Latino	84.6	68.4	$\chi^2(1) = 15.14^{**}$
% White	2.9	20.0	$\chi^2(1) = 30.36^{**}$
% Parents	51.4	27.3	$\chi^2(1) = 26.25^{**}$
% Husband's Immigrant Status	59.9	82.3	$\chi^2(1) = 26.15^{**}$
% Wife's Immigrant Status	63.3	88.2	$\chi^2(1) = 35.99^{**}$
Husband's Age	26.9 (6.0)	28.9 (5.5)	$t(426) = 3.47^*$
Wife's Age	25.2 (5.1)	27.3 (4.6)	$t(426) = 4.51^{**}$
Husband's Education	2.05 (0.9)	2.95 (0.9)	$t(425) = 10.12^{**}$
Wife's Education	2.28 (0.9)	3.17 (0.9)	$t(425) = 9.98^{**}$
Household Income	\$27,427.88 (\$11,792.57)	\$73,852.27 (\$17,710.84)	$t(426) = 31.73^{**}$

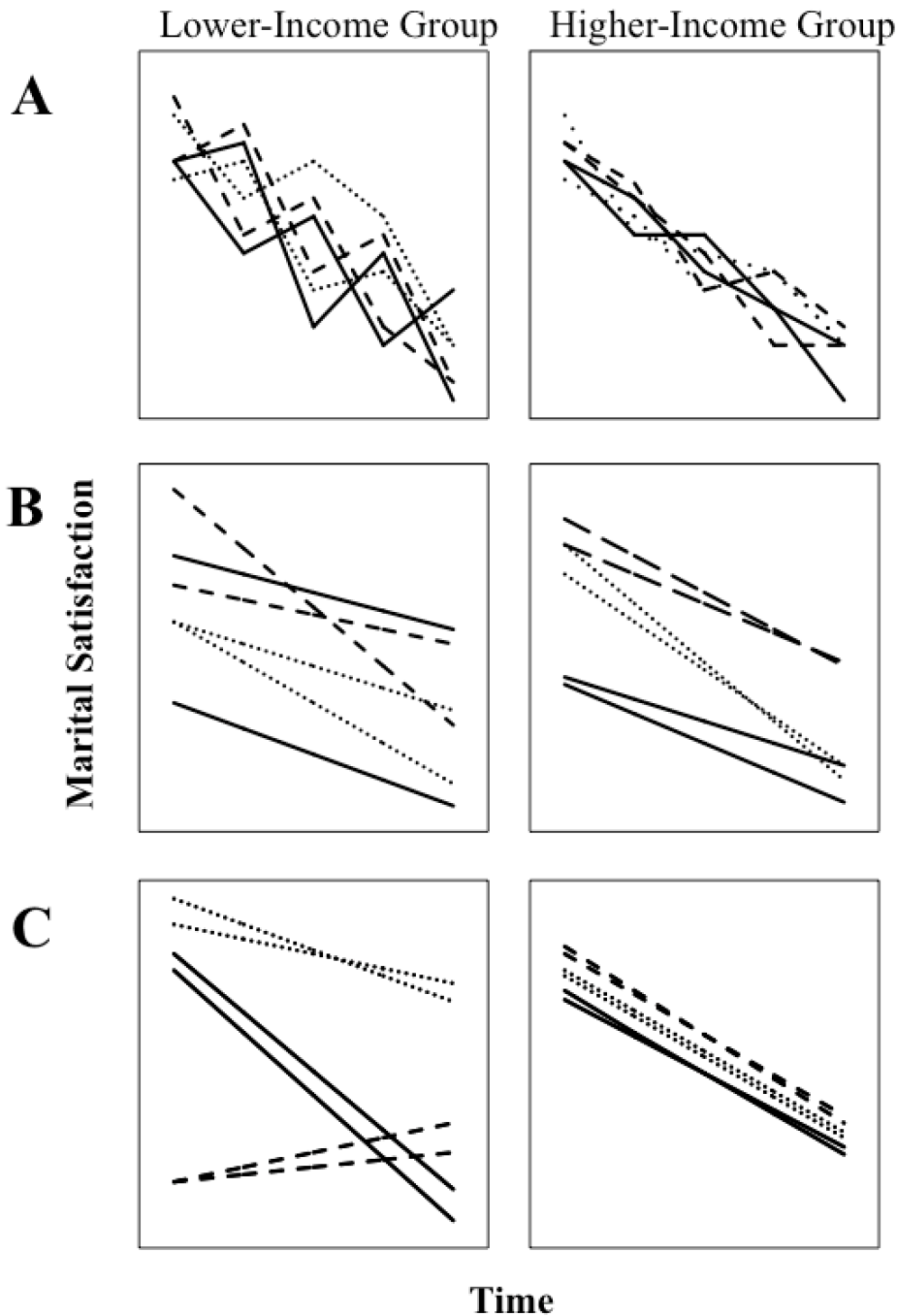
* $p < .01$, ** $p < .001$

Table 2: Fixed and Random Effects of Income on Marital Satisfaction Trajectory

	Lower-income Estimate (SE)	Higher-income Estimate (SE)	Test of Differences Between Income Groups
Fixed Effects			
Intercept	34.34 (0.82)*	34.32 (0.85)*	$b = -0.02 (SE = 0.28), p = .94$
Slope	-0.36 (0.06)*	-0.48 (0.06)*	$b = -0.13 (SE = 0.09), p = .15$
Random Effects			
Residual (L1)	5.95 (0.29)*	5.01 (0.22)*	$\chi^2(1) = 10.5, p < .01$
Individual- Level (L2)			
Intercept Variance	3.49 (0.78)**	1.61 (0.49)**	
Covariance	0.34 (0.15)*	0.31 (0.10)*	$\chi^2(3) = 11.9, p < .01$
Slope Variance	0.03 (0.08)*	0.05 (0.06)*	
Dyad Intercept Variance (L3)			
Intercept Variance	3.89 (0.89)**	3.51 (0.64)**	
Covariance	0.12 (0.20)	0.06 (0.15)	$\chi^2(3) = 1.7, p = .64$
Slope Variance	0.29 (0.09)*	0.39 (0.07)*	

Note: All estimates presented are adjusting for fixed effects of Parental Status, Race, Husbands' and Wives' Age, Education Level and Immigration Status as covariates. Estimates are from a best-fitting model that allows for random income differences at both the observation and individual level but not dyad level, but Chi-Square tests are presented from simplified nested models. * $p < .05$, ** $p < .001$.

Figure 1. Predicted Random Effects of Income on Marital Satisfaction Trajectories Within-Person (A), Within-Couple (B), and Between-Couple (C)



Note: The 6 panels above illustrate trajectories of marital satisfaction for husbands and wives in 3 hypothetical couples. Each couple is represented by its own pattern. The two A panels illustrate greater variability between observations in the lower-income group than in the higher-income group. The two B panels illustrate greater discordance between partners within a couple in the lower-income group than in the higher-income group. The two C panels illustrate greater variability among lower-income couples than among higher-income couples.

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The Ties that Bond or Break:

The Effects of Social Networks on the Development of Relationships

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We gratefully acknowledge the crucial assistance of Melanie Carpenter, Benjamin Higgins and Tenya Mai Thurston for their assistance in coding the empirical literature reviewed in the manuscript.

Abstract

A successful relationship is achieved by more than the actions of the two partners within that relationship. Rather, partners are embedded in a broader social context that exerts both subtle and direct influence on their behaviors, attitudes, and inevitably, their relationship success. In light of growing access to connect to our social networks through improved technology, such as smart phones, video chatting, and online social networks, yet reduced rates of interacting with our real-world social networks, the authors reviewed and evaluated the literature on how the composition and structure of spouses' individual and combined social networks impact marital satisfaction and stability over time. Although much of the prior research has had methodological limitations, findings from this review indicate that supportive and approving social networks that contain high quality relationships are consistently associated with better and longer-lasting relationships. Future directions are also outlined, such as further research examining how social network structures and couples' combined networks are associated with relationship outcomes over time.

Keywords: social networks, newlyweds, marital satisfaction, marital stability

The Ties that Bond or Break: The Effects of Social Networks on the Development of Relationships

The #1 ranked book on Amazon for the last four years in the category of relationships has been *The 5 Love Languages* (Chapman, 2015), which teaches couples that communicating better can improve their relationship. *The Seven Principles for Making Marriage Work* (Gottman & Silver, 2015) has sold over a million copies and teaches its readers that giving more physical affection will “make your marriage work.” The New York Times columnist Tara Parker-Pope (2010) says that dividing household chores more evenly leads to better relationships. What all of these books, and countless others, share is the implicit theory that the success or failure of intimate relationships is primarily the result of behaviors enacted by the couple themselves. If this is true, then partners who care about their relationships should prioritize activities and time spent with each other to promote the well-being of the relationship. Current trends have shown that couples are doing this. Indeed, over the last 25 years, individuals have, with increasing frequency, devoted more and more time to their partners (Amato, Booth, Johnson, & Rogers, 2007; Finkel, Cheung, Emery, Carswell, & Larson, 2015), and limited their time spent interacting with their extended social networks, community groups, sports leagues, and clubs (Putnam, 2000).

But couples are still, and always will be, embedded in a network of other people: family and friends, neighbors, coworkers, and consequential strangers. These people can play a large role in the success or failure of romantic relationships. Indeed, when couples are asked about their biggest area of conflict, one of the top problems reported are in-laws (Jackson et al., 2016), or close friends (Trail & Karney, 2012). Knowing that social network members play a significant role in the lives of couples is especially important in a world that is growing more and more interconnected. Smart phones allow us to communicate instantaneously, and a plethora of social networking sites, such as Facebook, Twitter, Pinterest, and Linked In, allow us to spend more time communicating, but less time interacting in real-life, with our social networks (McPherson, Smith-Lovin, & Brashears, 2006). In this changing world, how are our networks helping or hurting our relationships?

Although relationship researchers have been thinking about the impact of couples' social environments for some time (e.g., E. Bott, 1957), these issues are of particular importance now for three reasons. First, recent technological advances connect us to our social networks more than ever before. With instant access to others through mobile devices, we have the capacity to connect much more easily and regularly. Indeed, the average person spends nearly two hours per day on social networking sites (Mander, 2015). Moreover, our online social networks have grown larger over time. Facebook in particular has over 1.5 billion users worldwide. And whereas in 2005, only 8% of American internet-users were on social network sites, now nearly 75% are (Pew Internet & American Life Project, 2014). However, even though online networks are growing, it isn't necessarily true that our offline networks are growing as well. Evidence suggests that even when we are online, we are mostly interacting with those we are also connected to offline (Haythornthwaite, 2002). Thus, it is important to consider the implications of this increased access to our social networks in the context of our romantic relationships. Are couples connecting more with their networks, or are they simply connecting differently, and perhaps more superficially? Second, because of the rise of online dating, people are forming relationships with others who are sometimes disconnected to their real world network at the outset of their relationship. This means that couples pairing up are less likely to have met directly through friends or family, and may share fewer overlapping social contacts. This may be a boon for marital relationships or a burden. For example, it is possible that couples' relationships are stronger because of increased compatibility resulting from greater access to a larger pool of eligible partners. On the other hand, having fewer overlapping social contacts may place a heavy burden on the couple to introduce their networks to one another, which could be a relationship straining process. Third, the past decade has seen the development of sophisticated new technologies and analytic tools for assessing and describing social networks. For example, new technologies allow for easier social network data collection (e.g., computer-aided interviewing software, such as EgoWeb), and for easier social network data analysis (e.g., Ucinet; Borgatti, Everett, & Freeman, 2002; or Gephi; Bastian, Heymann, & Jacomy, 2009). Moreover, it is now possible to study the combined

social networks of both partners simultaneously as duo-centered social networks (Kennedy, Jackson, Green, Bradbury, & Karney, 2015).

In light of the changing role of social networks in daily life, and improvement in the methods to study them, researchers are publishing on this topic at exponentially higher rates now than in the past (see Figure 1). In fact, among the published studies of social networks and intimate relationships that we were able to identify for this review, over 50% were published in the last fifteen years, and 37% were published in the last five years.

The goals of the current paper are to assemble and integrate the existing literature on social networks and relationships. Toward that general goal, the remainder of the review is organized in several sections. The first offers definitions for the most common social network terminology. The second describes theoretical perspectives on the role of social networks in helping or hurting the future fate of intimate relationships. The third proposes a model that integrates current theories of social networks and intimate relationships. The fourth reviews existing research on the associations between social networks and relationships emphasizing the methods employed and the effects reported. A concluding section identifies immediate research priorities.

Defining the social networks of couples

A *social network* is a specific set of connections between people in a group (Christakis & Fowler, 2009). Social network studies typically take one of two approaches: *sociocentric* or *egocentric*. In the sociocentric approach, the focus is on a bounded group (e.g. a particular community, or classroom), and analyses describe the configuration of relationships within this bounded group. In the egocentric approach, the focus is on a particular individual (referred to as an *ego*) and the relationships between all members of the network that exist for that individual across a number of groups. As the network members influencing romantic partners are unlikely to be bounded to one specifiable group (e.g. only family, only

coworkers, or only church members, etc.), studies examining the effects of social networks on relationship outcomes usually adopt the egocentric approach, with a few exceptions.

With respect to understanding relationships, we can think of each partner as an ego surrounded by its own network. The members of that network have been referred to using a variety of terms, including (but not limited to) alters, nodes, actors, points, or (according to graph theory) vertices. In the present manuscript, we will use the term *alters* to refer to these network members. Assessments of social networks usually begin by soliciting lists of alters. However, much of the research in this review skips this step, instead asking participants about their global impressions of their network without directing attention to specific alters. For those who collect actual social network data, there are a number of ways to do this. For example, researchers can use name generators (K. E. Campbell & Lee, 1991) to ask their participants about their most meaningful relationships with others (the *psychological network*), or those with whom they have physically spent time with over a certain period (the *interactive network*, e.g., Milardo & Allan, 1997). If available, researchers can also use recorded data or archival records about previous interactions between individuals and their networks, such as using behavioral log data on Facebook (e.g., Burke & Kraut, 2013). Regardless of the method used, this process provides researchers with the first piece of information about the social network: its overall *size* (i.e., the number of alters in the ego's network).

After the list of alters has been generated, information can then be collected about individual characteristics of these alters in order to estimate various measures of *social network composition*. Social network composition has also been referred to as attribute data, or the properties, qualities, or characteristics that define attributes of the individuals within the network (J. Scott, 2012). Network composition can include a variety of information, such as demographics of network members (e.g., gender, race, age, marital status, job status), each alter's relationship to the ego (e.g., friend, family, or neighbor, etc.), or the ego's perception of each alter (e.g., whether that alter is struggling financially, or is happy, etc.) Network composition can also include key information about the quality of the relationship

between the alter and ego, such as whether this is someone who provides or requires emotional or tangible support, or if this is someone who is a distal or close network member (either psychologically or physically). Network composition is relevant to understanding couples in particular because network members can influence each other in different ways depending on these attributes. For example, alters with closer relationships to the ego may exert greater influence on their health behaviors (Valente, 2010). The divorce status of the alters surrounding a married couple may affect whether spouses consider divorce an option for themselves (McDermott, Fowler, & Christakis, 2013).

After establishing who is in the network, the next step is to examine who knows whom in the network in order to calculate various measures of *social network structure*. Social network structure has also been referred to as relational data, or the contacts, ties, and connections between individuals in the network (J. Scott, 2012). These connections have also been referred to as relations, lines, arcs, and (in graph theory) as a set of edges on the vertices in the network. In the present manuscript, we will use the term *ties* to refer to the connections between alters in the network.

Network structure can include information about how particular individuals are connected to other alters in the network, or can include emergent properties of the entire network when considered as a whole. Measures of centrality identify the most important or influential alters in a social network. For example, *degree*, which can be calculated for each alter in the network, roughly indicates the number of ties each alter has to other alters in the network. Alternatively, these indicators for specific alters can be aggregated to identify the *maximum degree* or *average degree* across the whole network. Network structure can also be described in terms of the *density* of the network (i.e., the proportion of people in the network who know one another, out of every possible connection that could exist if everyone knew everyone else, excluding ties to the ego; Mitchell & Trickett, 1980). Network structure is relevant to understanding relationships because network members can influence one another to different degrees depending on the configuration of shared relationships. For example, high degree network members are especially active in networks (McCarty, 2002), and may be important in coordinating social activities

(Carrasco, Hogan, Wellman, & Miller, 2008). As such, a couple with a network that includes a high degree alter may see particular benefits to their relationship when that alter approves of the relationship and wants to promote it, but may see detriments if that person does not.

A further consideration when examining social networks in couples is that the networks of each partner within a couple are not independent. Rather, partners likely share overlapping relationships with some of the same people, such as their closest friends, family, or even in-laws. Thus, couples' networks may be examined as a joint duo-centered network, such as the network in Figure 2, rather than as two separate ego-centered networks. Combining partners' networks allows researchers to objectively assess the amount of network *overlap* (i.e., the number of shared ties independently reported by each partner). This is distinct from perceived overlap (i.e., Sprecher & Felmler, 2000), a global construct capturing partners' perceptions of how many network members they share together, the estimation of which may be confounded with positive evaluations of the relationship. After identifying the overlapping network members, researchers can then derive estimates of composition and structure within and outside of this overlapping region, such as the number of overlapping alters that are predominately close to one partner or the other, or the number of single, married or divorced friends that are close to both partners. Examining overlap also provides the opportunity for researchers to evaluate rates of concordance or discordance between partners. For example, network members that one partner has a positive relationship with, but the other does not, may place additional burdens on the couple when interacting with them. The structure of this overlapping network may also impact relationship outcomes. For example, a couple with a densely connected set of shared alters may interact very differently with their network than a couple with separate networks of densely connected alters unshared with their partner. These and other important network characteristics can be examined only with dyadic social network data from both partners. The development of techniques for assessing and integrating network data from both partners within a couple (e.g., Kennedy et al., 2015) make it possible to examine the effects of social networks on the course of relationships more comprehensively.

Theoretical Perspectives on Social Networks and Relationships

Sociologists have been speculating about the role of our social ties in linking us to other individuals since the late 1800s (Tönnies, 1887/1957). In the 1920s, this interest spread to psychology, anthropology, and a more formal interest in social networks using systematic observation of group formation and social bonds (e.g., H. Bott, 1928; Hubbard, 1929). Shortly thereafter, theorists began examining the role of social networks in determining the success or failure of relationships and families in particular (E. Bott, 1957), and have continued to examine the ways that couples' broader social networks affect their roles and influence their decisions and behaviors.

In a seminal paper, Milardo and Lewis (1985) identified a tension that exists between couples and their networks. Social networks can be a source of information and support to facilitate effective relationship functioning with a romantic partner, yet social networks may also make relationships harder to the extent that they confront couples with disapproval, interference, or demands. Romeo and Juliet illustrate this tension. They had the makings for a great relationship: both were attractive, from wealthy families, and completely enamored with one another. Had their relationship blossomed within a different social environment, their powerful combination of traits may have led them to have life-long marital bliss. Unfortunately, this was not the case, as their families' long-standing rivalry led to a series of secrets that ultimately ended in Romeo and Juliet's untimely deaths. As an instructive contrast, consider the case of George Bailey, Jimmy Stewart's character in "It's a Wonderful Life." George hit rock bottom and contemplated suicide when his company was struggling financially. His life, his marriage, and his relationship with his children were all saved when his entire town came together to support him. In both cases, the social network played critically important roles in the lives of the main characters. Naturally, the social networks of most couples are likely to fall somewhere in the middle, providing support and making demands in different ways and at different times (Ruehlman & Wolchik, 1988). It is the balance

of these beneficial and damaging forces within a particular network that may contribute to the long-term outcomes of the couple embedded within it.

In the remainder of this section, we outline the predominant theories that describe the possible mechanisms through which social networks can influence relationship outcomes.

Support. The social network of a couple can provide supportive resources, i.e., social capital, that promote the continuation of a relationship. These resources may be particularly important when couples are under stress (Coleman, 1988). Examples of tangible support transactions include a ride to the airport, childcare assistance, or a personal loan. Social networks can also provide access to emotional support, such as a sympathetic ear, a hug, validation, or other acts of caring. By offering a couple aid, social network members can help couples work through their problems when they arise (Julien, Markman, Léveillé, Chartrand, & Begin, 1994; Milardo & Lewis, 1985). At the same time, members of the network may require these same or other resources in return. To the extent that the support received is greater than the support provided, one's social network could produce a stress-reducing and relationship-promoting environment. However, at times when the needs of the network outweigh the resources it provides, the costs of the social network may create a stress-enhancing and relationship-damaging environment.

In addition to understanding the balance of costs and rewards of support transfers, the composition and structure of the network may determine the facility of support transfers. A network composed of a greater number of family members would facilitate the transfer of support, as individuals are more likely to go to kin than friends when in need (Wellman & Wortley, 1990). Similarly, a network composed of alters described as close (psychologically or proximately) would facilitate support transfer more so than a loosely bound network of distant alters. The configuration of relationships between these individuals may also help or hinder the support-transfer process. For example, a network with higher density may allow for better coordination of support from the network, rather than requiring the couple to go to all members independently when seeking support.

On the other hand, some network structures may require substantial effort to maintain. Although there are benefits to having access to a greater number of social network members, it is also possible that the benefits of a larger social network may wear off when maintaining the network itself becomes burdensome (Burger & Milardo, 1995). According to the dyadic withdrawal hypothesis, as partners grow closer to one another, the network's needs and demands may be in direct competition with the time demands of the couple, so couples must withdraw from their networks to devote resources toward their partner. As a result, networks may shrink over time to produce benefits for partners, rather than increase in size (Huston & Burgess, 1979), which can be at odds with the goal of having access to the social networks' support.

Bott's hypothesis (1957) elaborates on this idea with respect to social network density. Specifically, Bott states that partners who are each connected to highly dense individual networks may find it difficult to connect with each other when they are required to fit into the norms of their own tightly knit networks. In the long run, these dense individual networks may require partners to have more segregated lives, and more segregated role division within the family, which could lead to relationship deterioration over time (e.g., Lavee & Katz, 2002). Thus, the density of the network may only be beneficial up to a certain point, or when also contained within the combined networks of partners.

In addition to access to tangible and emotional support transactions, social networks can also provide access to information. Two kinds of information are likely to be especially important. The first is useful information about how to tackle important issues the couple is facing (e.g., the name of a good marital therapist or babysitter, or where to go on a vacation together). The second is information about each other that can allow them to better interact, and understand each others' behaviors, attitudes, and intentions. Uncertainty reduction theory addresses this latter form of informational support, proposing that partners can reduce doubt about one another by looking to the social network for answers and information (Surra & Milardo, 1991). Using the network for information may be particularly valuable early in the development of new relationships when partners can learn from the other's social network

members (especially family and long-standing friendships). The beneficial insights of these network members are likely to continue throughout relationships' progression as well, such as when there are new decisions to be made (e.g., how to deal with infidelity, child-rearing decisions, or financial decisions). Taken together, these theories underscore the power that couples' social networks have to provide tangible, emotional and informational support that could help partners stay happy and stable at times when stress arises. However, social networks can also drain away resources, provide poor or ineffective support, or be difficult to maintain. Understanding both the composition and structure of partners' individual and combined networks can highlight when, and for whom, the networks of couples will help or hinder them in maintaining a satisfying relationship.

Approval. Social network members may exert direct pressure on the couple to stay together if they approve of the relationship, and want it to succeed (Sprecher, 2011), or may provide indirect influence by validating the relationship and encouraging a "sense of coupleness" by inviting partners to events jointly (Lewis, 1973a). According to theories about social sanctions, disapproval is most likely to occur when the partner does not adhere to the norms of the network (Surra & Milardo, 1991). Thus, network members may attempt to socialize these partners to fit in with the network's norms, which may create loyalty disputes between the partner and the network (E. Bott, 1957), and eventually create rifts between the partners themselves. Disapproval may also occur when network members believe the partners are not well suited to one another, or if they believe one partner is treating the other poorly. When any of these occur, the network may send signals to the partners to notify them of their approval, or create social sanctions at times when they disapprove of the relationship. These sanctions could be in the form of direct attempts to sabotage the relationship, treating the partner badly, asking one partner to spend time with them without the other, or directly discouraging the relationship (Sprecher & Felmler, 1992).

However, even if partners experience disapproval from their network, it does not necessarily follow that the relationship will deteriorate. A symbolic interactionist perspective (e.g., Lewis, 1973b) argues that negative reactions from one's social network may instead lead to a stronger couple identity

and greater subsequent commitment. This idea has been identified as a “Romeo and Juliet effect,” whereby parental interference in particular, can be viewed as a threat to individual freedom, and may inadvertently provoke psychological reactance leading to even greater commitment between partners (Brehm, 1966).

It is worth noting that couples are not just passive receivers of their network’s approval and disapproval; rather, partners may actively seek out this information from their network. Social comparison theory (Festinger, 1954; Surra & Milardo, 1991) highlights that, to determine whether the relationship is worth pursuing, partners may compare their own opinions about their partner to their network’s opinions of the partner (Oliker, 1989). Cognitive balance theories, and the theory of transitivity (Heider, 1958; Newcomb, 1961), further elaborate on this idea. As illustrated in Figure 3, balance theory posits that if one person is close to a social network member (A likes B) and that social network member approves of the person’s partner (B likes C), this can encourage increased liking for one’s partner (A likes C even more). On the other hand, if close network members disapprove of the romantic partner (B doesn’t like C), this creates imbalance in the system. This imbalance will either have to be resolved by disconnecting to the established social network member (A begins to dislike B), or through deterioration of the romantic relationship (A dislikes C). When the social network member is a family member or long-lasting close personal contact, this is when the romantic relationship is most at risk.

Quality. Positive interactions with network members can promote a positive mood, outlook, and better emotional capabilities (Schuster, Kessler, & Aseltine, 1990), which can then spillover into the romantic relationship and lead to more positive interactions between partners. Similarly, being surrounded by healthy individuals, or those doing well financially, may promote physical and financial health for partners. On the other hand, negative relationships with network members (e.g., conflicts with in-laws) can create stress, impair mood (Schuster et al., 1990), and spillover into the romantic relationship in a detracting way. Stress across a number of domains has been associated with less satisfying partner interactions (Repetti, 1989), more negative attributions (Neff & Karney, 2004) and greater conflict

(Karney, Story, & Bradbury, 2005). The vulnerability-stress-adaptation model (Karney & Bradbury, 1995) explains these associations, stating that stressful events can impede adaptive processes between partners (i.e., healthy communication), and will have long term impacts on relationship functioning, satisfaction, and stability. Thus, if relationships with network members are stressful, these externally stressful encounters are likely to negatively impact couples' relationships in the long-run, even if they are not directly related to the relationship itself (Karney et al., 2005).

Norms. A social network can also serve to prescribe norms for the couple to follow. Couples may look to their social network to evaluate the acceptability of divorce, or the lengths they are expected to go to in order to make their relationship work when problems arise (Felmlee, 2003). According to Asch's (1955) classic studies in social psychology, couples who do not know whether to progress the relationship or not may use their network as a source of informational social influence. On the other hand, the network may also act as a source of normative social influence, whereby couples engage in behaviors similar to those observed among network members, not because they are unsure what to do, but rather to fit in and maintain connections with those in their network. A network with few other couples or with examples of previous divorce, for example, may encourage partners that single life is preferred or that divorce is the norm, and that they too should be single or end their current relationship if in one. The opposite may also be true, such that individuals surrounded by many other coupled people may seek greater commitment with a partner.

Alternatives. The composition and structure of the network may influence the likelihood that a partner will encounter alternative romantic partners. With respect to network composition, the prior section highlighted that a network consisting of few other established couples might suggest that being single is the norm. However, this type of network may also create a social environment that provides access to available alternative partners, which is especially important if those alternatives are attractive and single potential romantic partners. With respect to network structure, a dyadic network with little overlap between the partners' networks may introduce individuals to situations where their partner is not

present, but alternative partners are. Repeatedly experiencing these sorts of encounters may reduce the potential costs of leaving the relationship over time. According to social exchange theory, and interdependence theory in particular (Thibaut & Kelley, 1959), relationships with high physical and social rewards (e.g., validation, caring, economic stability) and few costs would facilitate positive outcomes in a relationship. If instead the costs are high and/or the rewards are low, partners may look to their surrounding social environment to evaluate alternative options as a level of comparison. If the network does not provide promising alternatives, partners may stay satisfied in the relationship even with the presence of higher costs or lower rewards. However, if the network does provide promising alternatives (especially promising romantic alternatives), this may jeopardize the current relationship.

The social network can provide access not only to potential romantic partners, but also to alternative non-romantic relationships that might compete with the romantic partner. As mentioned earlier, the network can be used to provide support to both members of the couple when they are facing a difficult time together, which can help promote their joint relational well-being. In contrast, when just one partner is facing a difficult time, the network could provide an alternative source of support when the other partner is providing insufficient or ineffective support. This has been referred to as network substitutability (Marsiglio & Scanzoni, 1995), i.e., the ability of the network to fulfill the same needs as one's partner. In some cases, stressful experiences can prompt partners to engage in outside help-seeking that can mitigate stress and help resolve relationship conflicts. However, this may lead to a slippery slope over time, keeping partners together that may be better off apart, or masking larger issues that need to be addressed. Alternatively, these help-seeking experiences may foster alternative companionships that could jeopardize the relationship (Julien & Markman, 1991). In this way, the relationship and network may be competitive (Wellman & Wellman, 1992).

Constraint. Finally, the shared network of a couple can act as a perceived barrier to leaving the relationship. As couples become more interdependent over time, they are likely to develop increasingly interdependent networks as well. Specifically, couples social network structure should change over time

to include greater interconnectedness between ties within the networks and across spouses to increase network overlap. The pattern of these ties has implications for marital outcomes (e.g., Surra, 1988). Over time if issues arise, being in a highly overlapping social network may make partners hesitant to leave their relationship, constraining them to stay, so they will not lose access to their shared network members. This can be a boon for relationship stability, but does not necessarily improve the quality of the relationship. Thus, networks have the power to keep couples together when things get hard, but can keep couples together even when they arguably should not.

Critique. This review has outlined components identified by influential theories on social networks and relationships that can account for when social networks help or hinder marital relationships. However, there has been no comprehensive model that assembles these components together. Moreover, none of these models explicitly describe how successful couples' relationship will be as a function of their social networks considered both individually and in combination. Finally, most of these theories treat social networks as a static feature of couples' environments, rather than as a developing aspect of their environment. To address these limitations, the next section develops an integrative model of social networks and relationship outcomes.

A Social Network Model for Relationships

To overcome these limitations of existing theory, Figure 4 presents an integrative model that summarizes the array of mechanisms that can account for the impact social networks exert on the couples embedded within them. The model includes information about the composition and structure of each partner's individual social network, as well as the composition and structure of partners' combined duo-centric social networks. The alters included in the network, and configuration of ties among them, may influence relationship outcomes through any combination of the six mechanisms outlined. By knowing who is in the network, and who knows whom in the network, we can make predictions about how social networks will impact relationship satisfaction initially, and over time, and ultimately whether couples stay together. Each aspect of the model is described in greater detail throughout the remainder of this section,

followed by a critique of the model.

As mentioned previously, the composition of the social network includes all of the information about the individuals within that network. This collection of married and unmarried, supportive and unsupportive, close and distant family, friends, neighbors, and co-workers (along with a host of other possible compositional social networks factors, such as gender, race, income, proximity, etc.) can exert their influence directly on relationship outcomes, or may exert indirect influence on relationship outcomes through their effects on network structure. For example, people often go to family for support to avoid burdening their friends (Wellman & Wortley, 1990). Thus, having more family in the network would be associated with greater availability of support; this is a compositional element. But more family (in most cases) also corresponds to greater density within the network, because family members are more likely to know one another than a co-worker and neighbor would know one another (Stokes, 1983). Greater density may make support transfers more efficient (e.g., you can think of one family member telling others about a recent issue facing the couple and encouraging others to reach out to them). In this way, having more family may impact the outcomes of the relationship directly through composition, but the family's impact on the underlying structure of the network may also influence relationship outcomes. Extrapolating to the duo-centered network, we can also consider the indirect effects of family in the individual network through its effects on the overlapping network. More family in an individual's network is likely to be associated with greater family in the overlapping network, and the associated changes in the structure of that overlapping network. This model outlines all of these possible paths, but not all of the possible social network features that are associated with relationship outcomes over time. Understanding which compositional and structural elements of the network are associated with relationship outcomes is an important direction for future research, as well as confirming or refuting the existence of these direct and indirect paths.

Each of the six mechanisms outlined in the model can help or hinder relationship functioning in different ways (see Table 1), and each can be activated both by compositional and structural elements

from the individual and duo-centric networks. For example, the approval of a psychologically important alter (e.g., one described as especially close, or one of the first alters listed in the name generation task) may be just as important as the approval of a network alter that is not close, but is especially well connected (e.g., has high degree centrality). Likewise, the normative influence of other couples in the network may have a stronger impact on the partner they are closest to, or the partner they knew longer, but this may also impact the other partner through their shared network. In this way, multiple aspects of the network may contribute to each of these mechanisms. The opposite is also true, such that single aspects of the network may activate more than one of these mechanisms. Using the example of family again, more family may be associated with greater availability of support, but also greater alternatives for emotional support. We argue that these are distinct mechanisms that will need to be carefully examined to determine whether they are indeed mutually exclusive. For example, just because support is available from the network, does not necessarily mean that support is taken to the exclusion of support from the partner. Teasing these mechanisms apart will be an important direction for future research.

The model also identifies four relationship outcomes that may be impacted by couples' social networks: 1) relationship satisfaction, 2) changes in relationship satisfaction over time, 3) relationship satisfaction variability over time, and 4) relationship stability. Each of these outcomes is included based upon broader research in relationship science examining relationship satisfaction as it changes and develops over the course of the relationship (Arriaga, 2001; Karney & Bradbury, 1995). Relationship satisfaction is the outcome most regularly assessed in cross-sectional research on social networks and relationships. A number of social network features are likely to predict reduced relationship satisfaction, such as a network with low quality relationships, high support needs, or disapproval of the relationship. In contrast, changes in relationship satisfaction have been rarely assessed, but allow one to determine whether different social network features are associated with greater or less difficulty in maintaining relationship satisfaction over time. For example, one could imagine that a duo-centered network with alters who get along well with one partner, but not the other, may lead to increasing difficulties between

partners that only emerge over time. Third, associations between social networks and fluctuations in relationship satisfaction (i.e., relationship satisfaction variability) could allow one to assess whether different social network features are associated with having more unstable or fluctuating relationship satisfaction over time. Fluctuations in repeated measures of relationship satisfaction have previously been associated with higher risk of relationship dissolution (Arriaga, 2001; L. Campbell, Simpson, Boldry, & Rubin, 2010; Whitton, Rhoades, & Whisman, 2014), however have never been addressed in the research on social networks. Yet one could imagine that a network with physically distant negative relationships might have damaging effects on satisfaction only at times when proximity to those alters is reduced (e.g., the during the holidays), whereas the negative effect of these alters may dissipate after distance is again restored. Finally, relationship stability, or couples likelihood of staying together may also differ across couples with different social networks. The constraint mechanism, for example, highlights that partners may stay together because of their overlapping networks, but this does not necessarily mean that couples are satisfied in their relationship. Although most of these outcomes are likely to covary (e.g., the repetition of ups and downs in marital quality may have consequences for relationship stability; Kelley, 1983), different aspects of the social network may be more relevant for some of these outcomes than others.

Finally, the model also includes a feedback loop, such that couples' relationship outcomes at any time, are likely to influence the development of their social network going forward, which in turn will impact the relationship again at a later point. Indeed, couples do not passively collect a network of individuals around them, but rather select and chose, with some authority, who they spend their time with, and who is important to them. As couples experience changes in their relationship (e.g., periods of happiness or unhappiness with their partner, entering marriage, or separating), they can make changes to their network that foster the relationships that benefit them most at that time. Research examining differences in social networks across pivotal relationship transitions, as well as new research examining

longitudinal changes in networks over time, are both taken into account by the feedback loop in this model.

Critique. The proposed model advances theory on social networks and relationships in a number of ways. First, whereas much prior research has examined the influence of one's social network on one's own relationship outcomes, the present model takes account of the dyadic nature of relationships, highlighting that partners are embedded in a network of individuals influencing partners separately and together. Second, the model includes compositional and structural social network elements both for the individual and combined networks of couples. Considering these network elements simultaneously will allow researchers to examine competing sources of influence within the network to draw conclusions about which social network features matter most. To this effect, the model increases the potential to make policy or intervention recommendations based on fine-tuned analyses that identify specific aspects of the network to be targeted. Third, the model includes multiple competing mechanisms that set an agenda for future research to compare and contrast these mechanisms. Fourth, the model acknowledges multiple relationship outcomes, allowing researchers to distinguish the social network features that keep couples together from the features that keep couples stably satisfied over time. Finally, whereas much prior research has examined only the cross-sectional associations between social networks and relationships, the present model takes a more dynamic approach, accounting for change of both the network and relationship over time with the inclusion of longitudinal outcomes and a feedback loop.

Yet despite these strengths, several aspects of the model remain to be developed further. First, the model does not describe when or for whom these social network features will exert their effects on relationships (i.e. the moderators of these processes). For example, social networks may differentially impact couples from varying socioeconomic backgrounds, races, rural versus urban environments, couples with traumatic early life events (e.g., the divorce or death of their parents), or individuals with different personality traits. Currently, the model does not account for these possibilities. Second, the model does not describe the origins of the network, i.e., how the networks were created in the first place.

Early life experiences are likely to play a particularly important role in determining both the composition and structure of the network, and yet are not considered explicitly in the present model. Finally, the model assumes that the social networks will vary continuously across the population of couples. However, it is possible that certain clusters of social networks are more likely to exist than others. For example, there may be a disproportionate number of couples that are completely socially isolated. The utility of this model would be strengthened by future research that identifies whether there are patterns of networks that are more or less common, and what those patterns are.

Review of Research on Social Networks and Marriage

What has social network research revealed about how relationships succeed and fail thus far? In this section, we review the prior empirical research examining this question. To assemble articles, we searched PsychInfo and Google Scholar using combinations of the following keywords: *social network*, *social network size*, *social network density*, *social network overlap*, *social network composition*, and *marriage*, *newlywed*, *divorce*, *marital status*, *marital satisfaction*, *relationship satisfaction*, *marital quality*, and *relationship quality*. We also searched the reference lists of numerous review articles and book chapters. This yielded a preliminary list of 203 peer-reviewed papers that contributed novel empirical findings. Upon reviewing these articles, we removed 6 that were not in English, 26 that were did not include any assessments of social networks, 27 that did not include any assessments of relationship quality or stability, 4 that did not include either, and 23 that included both but did not report the association between them. This yielded a final sample of 117 papers. We discuss the studies in these papers in two sections. First, because the quality and appropriateness of the methods used vary vastly across studies, qualifying the validity of some findings, we first review the methods that have been used to study the association between social networks and relationships. Second, the findings themselves are reviewed.

Methodological Issues in Social Network Research on Relationships. The purpose of this section is to describe the methods that have been used to study the association between social networks and relationship outcomes. Of the 117 peer-reviewed published papers we identified, nine included two or three studies, for a total of 125 studies. Each of these 125 studies is reported in Table 2. Each column of Table 2 will be discussed in turn.

Sample independence. Across the last several decades, there has been an increasing empirical interest in the association between social networks and relationship outcomes (see Figure 1). As shown in Table 2, we identified 125 studies publishing associations between aspects of social networks and relationships. However, not all 125 of these studies represent 125 independent studies. Some datasets have been reevaluated in follow-up analyses within labs, and some publicly available datasets have been evaluated multiple times across different labs. Although it is not always possible to be certain when a dataset has been used more than once, we tried to identify when the same dataset was reported on multiple times by comparing sample sizes, years of data collection, authors of the papers, and explicit notes about the sample in the paper's method sections. In the 125 studies, we estimate that seven datasets were analyzed multiple times, yielding a total of 118 independent studies. Those studies making use of datasets that are reported on more than once have been denoted with an asterisk in column 1 of Table 2.

Sample Characteristics. Though not all associations between social networks and relationships will be medium or large effects, a sample of at least 50 participants is needed for sufficient power to find associations of this size (Cohen, 1988). Taken as a group, more than 90% of the 118 independent studies recruited sample sizes of more than 50 egos (see Figure 5, column 1). Of the 118 studies, two did not provide eligible estimates for the number of egos, because neither reported findings for individuals. Rather, one study used societies as the unit of measurement (Ackerman, 1963) and the other used American states as the unit of measurement (Study 2 of Valenzuela, Halpern, & Katz, 2014). As illustrated in Figure 6, most of the remaining 116 studies recruited more than 50 egos. Indeed, the majority had a few hundred (or even a few thousand) egos in their studies. For the studies that failed to

recruit a sufficient number of egos, two limitations should be kept in mind. First, the generalizability of findings may be limited to those represented in the small samples, making the results less useful to the broader population. Second, the results of small studies are difficult to interpret because they are often underpowered. When the results are statistically significant, the findings are less likely to be true (i.e., false positives or Type I error; Ioannidis, 2005), and may therefore overestimate the size of the true effect (Ioannidis, 2008). When results are not statistically significant, the findings could be false negatives (Type II error) if the true effect size was too small to detect with a small sample size (Sterne, Cox, & Smith, 2001). Therefore, it is difficult to interpret findings regardless of the pattern of significance, because small datasets do not provide sufficient power with standard statistical approaches. The studies in this review that failed to recruit a sample of at least 50 egos are listed in Table 2 as having Limitation #1.

Although the number of egos recruited across this body of research has generally been sufficient, the quality of the sampling frames has been limited. Figure 5 column 2 documents that about one-half of studies recruited egos without specifying the type of relationship they needed to be in to be eligible. Yet, social networks are likely to influence relationships to differing degrees at different stages of relationship commitment. For example, interference from the network may be less likely in the early stages of a new relationship when the likelihood of the relationship's progression is not yet known. As the relationship progresses, the network might start to interfere more once they know the relationship is garnering greater commitment. However, after the relationship progresses to engagement or marriage, the network should back off again to ensure they do not alienate the partners and can maintain a positive relationship with them (Johnson & Milardo, 1984). Studies that fail to account for the stage of the relationship under evaluation might therefore be limited, and are denoted as having Limitation #2 in Table 2. Figure 7 provides a breakdown of the types of relationships egos were in at the time of the study. Of note (besides the large proportion of unspecified relationship types) is that a few of the studies examined relationship processes among those who were not in relationships at all (i.e., single or divorced).

Another sampling frame issue across this body of research is the over-reliance on samples of individuals, rather than of couples (see Figure 5, column 3). Despite an interest in an inherently dyadic construct (i.e., relationship satisfaction or stability), over two-thirds of the studies assessed only individuals. The studies that examined the network of only one partner and its effect on that partner's relationship outcomes alone are denoted in Table 2 as having Limitation #3. By failing to recruit couples, research leaves out the possibility of examining cross-spouse effects. For example, having negative relationships with in-laws may be detrimental to one's own relationship satisfaction, but one can imagine that this would also (and potentially to an even greater degree) negatively impact the relationship satisfaction of the partner who witnesses the conflict between their family and romantic partner (i.e., balance theory; Heider, 1958). Moreover, studying only one partner leaves out important information about the couple's combined social networks (such as network overlap), as well as the couple's shared experiences of the relationship. For example, most relationship break-ups are initiated by one partner in the relationship, not both (e.g., Braver, Whitley, & Ng, 1994). Prior research documents that those who initiate a separation perceive better alternatives to their relationship than did their partners (Black, Eastwood, Sprenkle, & Smith, 1991). Therefore, network characteristics of the person who initiated the end of the relationship may differ from the network characteristics of the partner who did not, especially with respect to social network variables that inform about access to alternatives. Examining these hypotheses is not suited to samples of only individual members of couples.

The final major issue with respect to the sampling of egos is the over-reliance on homogenous samples of convenience, and University samples in particular (see Figure 5 column 4). Nearly one half of the 118 independent studies relied on samples of convenience (denoted in Table 2 as having Limitation #4). Indeed, many studies on social networks and relationships fall prey to the issues found in the broader literature on relationships: samples of dating college couples, or samples of predominately middle-class White educated married couples (Karney & Bradbury, 2005) However, it is important to consider that social networks may be especially important in less studied populations. For example, research on Black

families has suggested that social resources may be especially relevant when economic resources are limited (Broman, 1996; J. W. Scott & Black, 1989). Examining these hypotheses can only be tested appropriately in diverse samples of people in actual relationships. Unfortunately, much of the research making use of samples of convenience has relied on reports from undergraduates evaluating a new partner they have only dated for a few weeks, or reports from samples of undergraduates thinking about past or hypothetical relationships.

Assessing the Social Network. Although prior research has generally recruited a sufficient number of egos, few studies have assessed social network characteristics from a sufficient number of alters within these ego's networks. In fact, over one-half of studies did not assess the characteristics of individual alters at all, and instead rely on egos' global assessments of their networks (see Figure 5 column 5). Studies relying on global evaluations of the network without assessing specific alter characteristics are denoted in Table 2 as having Limitation #5. When using global measures, researchers can assess the general availability of social support, or perceptions of approval from the network overall, or from particular groups in the network, such as family versus friends. However, these reports may be driven by participant's global feelings of well-being at that time. For example, someone struggling emotionally at the time of assessment may report low availability of support from his or her network. If instead this ego were asked whether person A, person B, or person C in their network provided support, these concrete descriptions of specific people may be less colored by global feelings. Moreover, assessing the characteristics of specific alters allows one to derive estimates of emergent properties of the network's structure, such as network density, or degree centrality measures. These, and other aspects of network structure, may not be accessible to egos at a global level. For example, it is unlikely that a person will know the density of their network if simply asked.

For the less than one-half of studies that did assess characteristics of individual alters within the network, the majority included fewer than five alters. In fact, as illustrated in Figure 8, 24 (44%) of the 54 studies assessing specific alters only asked about one or two people. These studies, and any studies

including only a few alters in the network, are problematic for two primary reasons. First, studies on human network size have documented that people's average network size is much larger (e.g., 150 network alters; R. A. Hill & Dunbar, 2003). Although all network members are not likely to be close contacts, prior research has documented that important contacts are not always named immediately (Tucker et al., 2009), and that peripheral members of our networks play crucially important roles in our social environment (Fingerman, 2009; Granovetter, 1973). Thus, it requires naming more than a few people to ensure that important alters are included in the network. Second, by including so few alters, it is impossible to derive any meaningful measures of network structure. Prior research has documented that at least 20 alters are needed to calculate reliable estimates of network structure (Golinelli et al., 2010; McCarty, Killworth, & Rennell, 2007). In the present review, we denoted the studies with less than 5 alters in the network as having Limitation #6 in Table 2.

Additionally, the majority of prior research assessing social networks egocentrically has relied on the reports and perceptions of the ego exclusively, without also contacting the alters for corroboration. Reports from an ego alone are sufficient if one is only interested in the ego's perception of network characteristics. However, these reports may be biased and inaccurate if egos are asked to provide information they do not know. Particularly in studies of larger social networks, egos may not know the marital status, parental status, income, age, or educational status of some of their peripheral network alters, let alone the ties among these alters. Therefore, including reports from alters ensures that information is complete and accurate. The inclusion of reports from both alters and egos also provides the opportunity to test new hypotheses about discrepancies and accuracy in reporting. For example, an ego's report of support receipt may or may not match an alter's report of providing support. As documented in the broader literature on support provision between romantic partners, these sorts of "invisible support" encounters may yield even greater benefits than when supportive acts are perceived by both partners (Bolger, Zuckerman, & Kessler, 2000). The same may be true in support transactions between a romantic partner and his or her network members. Thus, collecting data from alters not only provides access to

complete and accurate information about network composition and structure, but also provides the opportunity to test new hypotheses about accuracy and bias. Much of the prior research has not been designed to test these sorts of hypotheses, so criticizing these papers should be done only under consideration of its intended purpose. This is especially true in larger studies where contacting all of the alters may be cumbersome and unnecessary and when ego's perceptions are the only one's relevant to the study hypotheses. Nevertheless, it is worth noting that only about ten percent of studies have made an effort to corroborate ego reports with reports from alters (see Figure 5, column 7). The studies that did not contact alters are denoted in Table 2 as having Limitation #7.

Analytic Strategies. There are a number of questions researchers must answer when designing their studies. One relevant to the present review is: which aspects of social networks and relationships to study? Social networks are rich sources of data, but to date only a few aspects of social networks have received much empirical attention. Column 5 of Table 2 lists the social network variables that have been analyzed in each of the prior studies included in this review. As illustrated in Figure 9, most social network findings have been published on social support and approval from networks, followed by the quality of relationships with network alters, constraint caused by global perceptions of overlap or shared ties with partners, and the time spent with network alters. Much less attention has been devoted to research on online networks (which makes sense as this is a relatively new opportunity), norms shared in the network, alternatives, the composition of family and friends, and network structure. As illustrated in column 8 of Figure 5, only about twenty percent of studies have considered structural aspects of social networks in their study designs at all. Those that did not are listed in Table 2 as having Limitation #8.

Although some attention has been directed toward global perceptions of social network size and perceived overlap, relatively few structural features of the network have been examined with social network data on individual alters and the ties among them. One reason for this is that most studies have not collected appropriate data to address these issues in the context of relationships. Indeed, of the 118 studies, only 5 included the recommended 20 alters per ego needed to properly assess network structure, yet only one

reported on overall network size, and none of these studies reported on network structures like density or degree.

In addition to the limited scope of prior research with respect to social networks, there has also been limited evaluation of relationship outcomes. Column 6 of Table 2 lists the relationship variables examined in prior research, and reveals that there has been a heavy reliance on examining static aspects of relationships, such as satisfaction level or relationship status at a particular time. Of the 118 studies, nearly two-thirds have been cross-sectional designs (see Figure 5, column 9, and individual studies denoted in Table 2 as having Limitation #9). Yet, relationships are dynamic, fluctuating through highs and lows over time (Karney & Bradbury, 1995) and prior work has documented significant declines in marital satisfaction over the first years of marriage (e.g., Kurdek, 1998). Therefore, studying levels of satisfaction or relationship status at just one point in time can be misleading. Of the 118 studies, only 6 have examined changes in relationship satisfaction as an outcome variable (relationship satisfaction slopes).

Just as relationships change over time, so too do social networks. Longitudinal research on social networks has documented that there is significant turnover in the composition of networks over time, especially through important life transitions, such as into or out of marriage, or parenthood (Wellman, Wong, Tindall, & Nazer, 1997). Network structure changes over time as well. For example, as individuals age, their networks tend to shrink (i.e., Carstensen, 1992). Thus, it is important to understand how these effects unfold in sequence. Cross-sectional designs make it difficult to ascertain whether aspects of the network are predicting the course of the relationship or if the relationship is predicting the composition and structure of the network. In the prior literature, 15 of the 118 studies in this review evaluate the association between networks and relationships in both directions (see column 7 of Table 2). However, 8 of these 15 studies were exclusively cross-sectional designs, so it is unclear how to interpret these findings. To determine whether social networks predict subsequent changes in relationship outcomes, or if relationship outcomes predict subsequent changes in social networks, or both, it is necessary to study

couples repeatedly over time. A few studies have examined how networks change in the context of relationships, and a few studies have examined how relationships change in the context of networks, but there has not yet been a study that examines both networks and relationships as they both change over time.

Results of Social Network and Relationship Research. Keeping the methodological limitations in mind, the remainder of this section reviews the 297 findings reported in the 118 independent studies assessing the association between social networks and relationship outcomes. Each area of research illustrated in Figure 9 will be discussed in turn, beginning with the most frequently addressed topics and ending with those least commonly studied.

Support. The broader literature on social support has documented that support, and perceptions of support in particular, are important predictors of relationship satisfaction. Consistent with this literature, observational studies on social network support (those derived from global measures and social network interviews) have consistently documented significant positive cross-sectional and longitudinal associations between relationship satisfaction levels and support from friends (Blair & Holmberg, 2008; Demir, 2010; Pittman & Lloyd, 1988; Proulx, Helms, Milardo, & Payne, 2009; Rodriguez, Helms, Supple, & Hengstebeck, 2014), support from family (Blood, 1969; Bryan, Fitzpatrick, Crawford, & Fischer, 2001; Demir, 2010; Leiter & Durup, 1996; Reczek, Liu, & Umberson, 2010; Taylor, Brown, Chatters, & Lincoln, 2012), support from the partner's network (Dainton, 2015; Goodwin, 2003) and support from the network as a whole (Andres, 2014; Barton, Futris, & Nielsen, 2014; Blair & Holmberg, 2008; Cotten, Burton, & Rushing, 2003; Cotton, Cunningham, & Antill, 1993; Holmberg & Blair, 2016; Jin & Oh, 2010; Jordan & Deluty, 2000; Julien & Markman, 1991; McDaniel, Coyne, & Holmes, 2012; Sprecher & Felmlee, 1992; Voydanoff, 2005). The only studies to date to examine social network support as a predictor of changes in relationship satisfaction have shown mixed results. More support from one's father predicted slower rates of decline in marital satisfaction over 8 years, however there was no

significant effect of one's mother's support on changes in marital satisfaction over this time (Reczek et al., 2010).

Relationship stability has been differentially associated with positive and negative network support, depending on who the support provider is. Relationship break-ups are more likely among those who report greater support from a close friend (Hogerbrugge, Komter, & Scheepers, 2013; Jensen & Rauer, 2015; Jensen & Rauer, 2014) or parent (Hogerbrugge et al., 2013), presumably because those in unstable relationships are most likely to seek support from those closest to them. However, relationship break-ups are less likely among those with greater support from siblings or in-laws (Hogerbrugge et al., 2013) or support from the network overall (Sprecher & Felmlee, 1992), presumably because those who maintain strong relationships with those in their partner's network have stronger romantic relationships.

Prior research has also examined the inverse relationship and provided support for a feedback loop. With respect to relationship satisfaction, prior research has documented that more satisfied couples perceive greater support available to them from their network cross-sectionally (Hawkley et al., 2008), as well as in samples of married couples longitudinally, three months (Leiter & Durup, 1996) and one year later (Bryant & Conger, 1999). Although satisfied couples perceive more support available to them, they are less likely to seek it from their network (Julien & Markman, 1991), and are less likely to actually receive it, especially from friends (Levitt, Weber, & Clark, 1986). Couples with higher relationship satisfaction are also more likely to engage in target-directed actions, or acts of revealing and concealing specific information about their relationship to their network (Baxter & Widenmann, 1993). In doing so, more highly satisfied couples may be strategically monitoring the information they share to ensure they receive the support they want from their network.

Relationship status has also been examined as a predictor of both perceptions of support provided to the network and perceptions of support received from the network. Research on support provided to the network has documented that single individuals (i.e., those never married, or previously married) report

providing more support to siblings, parents, friends and neighbors than those in committed relationships (i.e., those exclusively dating, cohabiting, or married; Sarkisian & Gerstel, 2015). However, individuals in committed relationships are much more likely to be called upon for support specifically related to other's relationship problems (Lind Seal, Doherty, & Harris, 2015). With respect to support provided to the network, the findings have been inconsistent. Some research has documented that single individuals receive less support from their network broadly (Brody, Litvin, Hoffman, & Kleban, 1995; Turner & Marino, 1994), from family (Fischer, Sollie, Sorell, & Green, 1989; Hogerbrugge et al., 2013) and from friends (Dailey, Brody, & Knapp, 2015; Hogerbrugge et al., 2013) than do those in committed relationships. However, other research has documented the opposite effect: single individuals receive more support from their network (Sarkisian & Gerstel, 2015), especially in samples of single mothers (Tietjen, 1985), and the elderly (Coward, 1987). These discrepancies may have emerged due to differences in the need for support across these samples. Single mothers or elderly single people, for example, may be especially in need of support, and have networks that will provide it to them when there is no spouse present. On the other hand, those who have not needed support have not given their network the chance to prove that support is available. This possibility has not been directly evaluated, but it is a direction for future research. Comparisons of those in marriages to those separated (Nelson, 1995) or widowed (Cotten, 1999) are consistent with this idea, revealing that individuals post-marriage (presumably in need of support at that time) perceive more support available to them than those in marriages. A study of divorcees also indicates that the longer one has been divorced, the more emotional support they perceive (Leslie & Grady, 1985). The only finding counter to this hypothesis comes from research on married couples in military-induced separations (Andres, 2014). These spouses perceived less support available to them during and after their separation than they had perceived before it. In this case, network members may have been less motivated to provide support because they knew the separation was caused by an external factor that would resolve itself.

Together, these patterns of findings indicate that greater perceived availability of support is associated with higher relationship satisfaction and stability, and that couples in more highly satisfying and stable relationships perceive greater support available to them, and less need of support from their networks. However, missing from this literature is an evaluation of the relative benefits of support received from the network to the costs of support provided to the network. Although there is strong evidence that more support is better, there has not been a lot of research on the costs of support provided, or the relative weights of these support transactions.

Approval. In 1972, Driscoll, Davis, and Lipetz reported that greater disapproval from one's family was associated with increased love and commitment over time. The authors famously called this the "Romeo and Juliet effect." Many other researchers found this troubling, as it goes against the common intuition that more approval should facilitate greater relationship functioning. Thus, it inspired a large body of research that attempted to explain this effect and find its limits. Notably, the majority of attempts to replicate these findings have not been successful, indicating instead that more approval from family and friends was either not associated with relationship satisfaction (Etcheverry & Agnew, 2004; Sinclair, Hood, & Wright, 2014), or was associated with higher relationship satisfaction (Barton et al., 2014; Bryant & Conger, 1999; Busby, Boden, Niehuis, Reifman, & Fitzpatrick, 2015; Caron & Ulin, 1997; Dailey et al., 2015; Lehmiller & Agnew, 2007; Lewis, 1973b; MacDonald, Marshall, Gere, Shimotomai, & Lies, 2012; Parks, Stan, & Eggert, 1983; Sinclair, Feilmlee, Sprecher, & Wright, 2015; Sinclair et al., 2014; Sprecher & Feilmlee, 1992; Wright & Sinclair, 2012), greater commitment (Cox, Wexler, Rusbult, & Gaines Jr, 1997; Lehmiller & Agnew, 2007), and greater relationship stability (Etcheverry & Agnew, 2004; Etcheverry, Le, & Charania, 2008; Feilmlee, Sprecher, & Bassin, 1990; Lehmiller & Agnew, 2007; Lewis, 1973b; Sprecher & Feilmlee, 1992; Sprecher & Feilmlee, 2000). Likewise, those who experienced more disapproval or relationship interference from their network experienced more marital distress (Julien et al., 1994), faster relationship decline (Johnson & Milardo, 1984), and greater likelihood of a break-up (Widmer, Giudici, Le Goff, & Pollien, 2009). Evidence from experimental research also did not find

support for the Romeo and Juliet effect. In one study, participants were asked to imagine a relationship with a hypothetical partner, and then read a vignette showing a friend or family member's approval or disapproval. In a second study, participants were randomly assigned to talk on the phone with a potential dating partner (confederate) who was either given high or low approval ratings. Those in the higher approval conditions in each of the studies reported greater commitment and liking for the dating partner (Sinclair et al., 2015). The only finding somewhat consistent with the "Romeo and Juliet effect" indicated that those who perceived their family's approval to be the primary reason for their relationship's continuation (as opposed to characteristics of the partner, timing, etc.) had lower marital satisfaction (Surra, Arizzi, & Asmussen, 1988). Felmler (2001) offers a more integrative perspective, suggesting that when family disapproves, relationship break-up rates may drop, but only when friends do approve.

Evidence for a feedback loop has also generally been supported by research, such that couples with higher relationship satisfaction report more approval from their partner's network (Parks et al., 1983) and their own network (Bryant & Conger, 1999; Cox et al., 1997; Etcheverry et al., 2008; Parks et al., 1983), compared to couples with lower relationship satisfaction. At greater levels of relationship commitment (Cox et al., 1997), and later stages of relationships (i.e., engagement and marriage compared to dating), ego's also report more approval from friends and family (Dailey et al., 2015; Sprecher & Felmler, 2000), despite expending more effort to win over parents (Leslie, Huston, & Johnson, 1986), and less interest in approval from friends and other kin (Johnson & Leslie, 1982). Studies examining reports from alters in observational and experimental designs similarly report approval from network alters is greater when the alters believed the ego's relationship was satisfying (Etcheverry, Le, & Hoffman, 2013). A few studies have also described this association as curvilinear, such that couples with high or low levels of intimacy had more network approval (Knobloch & Donovan-Kicken, 2006) and less network interference (Johnson & Milardo, 1984), than couples with moderate intimacy. Together these findings suggest that, contrary to the Romeo and Juliet effect, more approval is better, and better relationships have more approval. There has not been examinations of the underlying structure of approving and

disapproving alters, nor has there been much longitudinal research examining the ordering of these associations, so much research is still needed to determine the specific conditions under which network's approval facilitates or hinders relationship functioning.

Quality. Similar to the idea of stress spillover (e.g., Neff & Karney, 2004), where demands from external sources of strain (i.e., work) make relationship functioning more difficult in the home, strain caused by poor relationships with social network members may also spillover into the relationship. There has been a fair amount of support for this idea, such that higher conflict between couples and their own family is associated with greater marital strain (Reczek et al., 2010) and lower relationship satisfaction (Pittman & Lloyd, 1988; Taylor et al., 2012). Those with conflict with in-laws (Bryant, Conger, & Meehan, 2001) or stress from family, friends, and other external demands (Neff & Karney, 2004) also report faster rates of decline in satisfaction. And, those with more persistent strains from network relationships along with other sources of stress are more likely to break-up (Røsand, Slinning, Røysamb, & Tambs, 2014). In contrast, individuals who have better relationships with their social networks report better relationship satisfaction (McDaniel et al., 2012; Walker, Isherwood, Burton, Kitwe-Magambo, & Luszcz, 2013) and lower likelihood of a break-up (Sprecher & Felmlee, 2000). Lesbian and gay couples who feel more comfortable being “out” with their networks also report greater relationship satisfaction (Caron & Ulin, 1997; Jordan & Deluty, 2000). Moreover, couples with bicentric network configurations (i.e., networks in which both partners experience frequent positive contact with their friends and family) report higher relationship satisfaction and lower likelihood of relationship dissolution (Widmer et al., 2009; Widmer, Kellerhals, & Levy, 2004). In experimental paradigms, dating couples assigned to discuss deep personal issues rather than have small talk with another couple, reported feeling more positively toward the other couple, and closer to their own partner at the end of the laboratory session, and one month later (Slatcher, 2010). In a similar lab task, couples matched with another couple that was highly responsive to their disclosures, felt greater relationship satisfaction after the task (Welker et al., 2014).

Across all of these studies, greater quality of network relationships was consistently positively associated with the quality and stability of the romantic relationship.

Similarly, the quality and stability of the romantic relationship was consistently positively associated with qualities of the social network relationships. For example, more satisfied partners reported experiencing less discord (Bryant et al., 2001) more positive feelings toward their partner's network (Bryant & Conger, 1999; Parks et al., 1983), whereas dissatisfied partners tended to describe more negative relationships with their own and partner's families (Bertoni & Bodenmann, 2010; Julien et al., 2000). Separated women reported more conflict with her network members than married women (Nelson, 1995). And in an experiment, those manipulated to feel threat about their relationship were more likely to criticize a friend (Gomillion, Gabriel, & Murray, 2014). All of these findings suggest that stress from the relationship can spillover to the network, just as stress from the network can spillover into the relationship.

Constraint. Greater social connections across spouses in perceived and actual network overlap has been hypothesized to improve partners' sense of "coupleness" as well as increasing the costs of ending the marriage. Early research in this domain provided support for this view, documenting that more perceived shared network members and closeness to the partner's siblings was associated with greater relationship integration (i.e., more shared leisure, decision-making, and division of household labor; Gordon & Downing, 1978). More recent studies also report that knowing more of the partner's network, communicating with them more, and feeling close with them (Kim & Stiff, 1991), as well as greater perceived network overlap overall (Barton et al., 2014; Cotton et al., 1993) are all associated with higher marital satisfaction. Research comparing the networks of Black and White couples, similarly indicates that greater perceived closeness between wives and her husband's family is associated with higher levels of relationship satisfaction for both husbands and wives cross-sectionally (Timmer, Veroff, & Hatchett, 1996) and less steep declines in satisfaction over the first three years of marriage (Timmer & Veroff, 2000) among Black (but not White) couples. With respect to marital stability, prior research has found

that more perceived shared friends (Booth, Edwards, & Johnson, 1991; Hogerbrugge et al., 2013; White & Booth, 1991), more perceived family overlap (Hogerbrugge et al., 2013), greater closeness to in-laws (Orbuch, Bauermeister, Brown, & McKinley, 2013; Timmer & Veroff, 2000) and greater perceived overall network overlap (White & Booth, 1991) are all associated with lower likelihood of divorce. Studies examining objective network overlap have been more rare, but consistently provide convergent evidence with relationship satisfaction (Cotton et al., 1993; Julien & Markman, 1991; Kearns & Leonard, 2004; Kim & Stiff, 1991; Stein, Bush, Ross, & Ward, 1992). The one study examining objective network overlap and relationship stability documented that divorce rates were lowest in endogamous societies (i.e., societies where partners meet and marry within the community and therefore have greater spousal network overlap; Ackerman, 1963). Together, these findings all support the notion that greater network overlap, whether perceived overlap or actual overlap, is associated with longer and happier relationships.

This pattern also seems to be reinforcing, such that couples with higher relationship satisfaction report more communication with their partner's network, higher perceived network overlap (Parks et al., 1983), and higher actual network overlap cross-sectionally (Hansen, Fallon, & Novotny, 1991), and a year, and two years later (Kearns & Leonard, 2004). As the stage of the relationship progresses, partner's perceive more network overlap (Kalmijn, 2003; Kalmijn & Bernasco, 2001; Milardo, 1982; White & Booth, 1991), whereas those with deteriorating relationships perceive less overlap (Milardo, 1982), those who ultimately divorce lose access to shared network members (Albeck & Kaydar, 2002), and those who remarry develop less overlap in their second marriage (Kalmijn, 2003).

Time Spent Together. Several studies have documented conflicting associations between the amount of time and number of interactions with one's network and relationship outcomes. For example, research indicates that more time with family (Pittman & Lloyd, 1988) and having family in the neighborhood (Blood, 1969) are associated with higher relationship satisfaction. However, some evidence suggests this is more beneficial for husbands than wives (Burger & Milardo, 1995). Greater network involvement generally has also been associated with higher relationship satisfaction (Beach, Arias, &

O'Leary, 1986; Jin & Oh, 2010). In contrast, more interactions with the network without the spouse (Julien & Markman, 1991), and greater network involvement (i.e., greater time and support; Jin & Oh, 2010), were associated with lower relationship satisfaction. In an experimental paradigm, experimenters manipulated whether couples engaged in a lab discussion alone, or with another previously unknown couple. Spending this time with the other couple did not impact the participant's report of relationship satisfaction (Welker et al., 2014). Together, these results imply that interactions with the network may promote positive relationship outcomes, but perhaps only when those interactions do not interfere with time with the spouse, and only when those encounters are with known network members. These possibilities should be evaluated directly in future research.

Examinations of the reverse association have provided some support for a feedback loop. As the relationship stage increases (i.e., from single to dating to engagement and marriage) individuals spend less time with their friends (Kalmijn, 2003; Sarkisian & Gerstel, 2015), family (Sarkisian & Gerstel, 2015), neighbors (Sarkisian & Gerstel, 2015) and acquaintances (Milardo, Johnson, & Huston, 1983), and less time in leisure activities with their networks overall (Surra, 1985), but do perceive their spouse to invest in shared friends more (Stafford & Canary, 1991). A divorce is associated with less social integration with friends introduced by the former spouse (Albeck & Kaydar, 2002), and with peripheral members of the network (i.e., in church, social clubs, with neighbors; Kalmijn & van Groenou, 2005), but more contact with one's own close friends (Kalmijn & van Groenou, 2005). A remarriage is associated with withdrawal from the close network again (Kalmijn & van Groenou, 2005). Thus, as individuals move in and out of relationships with others, it seems that they invest more time in their network when single or after a break-up, but withdraw from their network to a certain extent when in a relationship or married. The only findings counter to this conclusion documented that couples with high relationship satisfaction are more likely to spend time with their social network (Dindia & Baxter, 1987; Julien & Markman, 1991).

Family and Friends Composition. Six percent of the prior research examining social networks in the context of relationships has focused on changes in the composition of the network, without regard for the specific quality or amount of time spent with those alters, and instead evaluating just the raw number of family or friends in the network. Prior research on friends has been quite consistent, reporting that as the number of friends in the network increases, as reported by the ego (Booth et al., 1991), or by the alter (McDermott et al., 2013), the likelihood of divorce decreases. Moreover, friends (and especially female friends) are great at predicting the future fate of the relationship (Loving, 2006). Prior research on family has been less consistent. For example, more of wives' own or husbands' family members in her network was associated with her own increased relationship satisfaction (Cotton et al., 1993), but more of her siblings in the network was associated with less marital integration (i.e., more shared leisure, decision-making, and division of household labor; Gordon & Downing, 1978). An equal number of family members in partner's overlapping networks was associated with increased satisfaction for both husbands and wives (Julien, Chartrand, & Begin, 1999). However among Black couples, only husband's closeness to his own family was associated with greater satisfaction for husbands and wives, not wives' closeness, nor equality (Timmer et al., 1996). In sum, more friends added to the network is associated with better relationships. This makes sense because friend relationships are typically positive, and would be eliminated if not. However, the effects of family in the network are sometimes positive and sometimes negatives, perhaps because we have less choice about who our family members are, and some relationships may be positive and supportive, whereas others are negative and draining.

Marital status also seems to have profound effects on the composition of friends and family in the network. For example, marriage increases the number of kin in the network (Gerstel, 1988), but reduces the number of friends (Fischer et al., 1989; Johnson & Leslie, 1982). Although a break-up or divorce is also associated with more kin (Gerstel, 1988; Leslie & Grady, 1985), and fewer friends generally (McDermott et al., 2013), it has been reported to be associated with more close old friends (Gerstel, 1988), and increases in the short-term, but decreases 6 months later, in the number of professionals and

clergy (Nelson, 1995). Thus, marital status changes seem to be highly associated with network turnover with consequences both in the short- and long-term.

Structure. Very little research has examined how aspects of social network structure, such as network density, overall size, or measures of centrality, are associated with relationship outcomes. The only studies that have reported on this association describe sporadic findings on social network density. For example, one study documented a non-significant association between network density and relationship satisfaction across the sample overall, but a significant positive association among just the young wives in the sample (Rogler & Procidano, 1986), whereas another found a significant negative association only after adjusting for age (Hansen et al., 1991). Studies on the division of household labor document a non-significant association between network density and marital role segregation (i.e., non-overlapping division of household labor; Udry & Hall, 1965), but a positive association when considering only the density of kin in the network (M. A. Hill, 1988).

One study suggested that relationship status is a stronger predictor of the network, than the network is of the relationship (McDermott et al., 2013), but these studies have also shown mixed patterns of results. Some studies report that divorce leads to very-close-knit networks with higher density (Leslie & Grady, 1985; McDermott et al., 2013) and that this density only continues to grow the longer one has been divorced (Leslie & Grady, 1985), whereas others find that divorce leads to high turnover in networks (Gerstel, 1988), and a greater likelihood of only befriending one spouse of married couples rather than both (Albeck & Kaydar, 2002), which would be associated with lower density. Another study documented that marital status changes, regardless of the direction (i.e., divorce to marriage, or marriage to divorce) lead to significant turnover in the networks 10 years later, and therefore lower density (Wellman et al., 1997). Studies on overall network size report similarly conflicting evidence. For example, divorce is associated with increases in the size of the social network (Albeck & Kaydar, 2002), but separated spouses report having more people leave their network after a divorce, and thus smaller networks (Nelson, 1995). Married spouses report having smaller networks compared to those only dating

(Johnson & Leslie, 1982), but larger networks than those in remarriages (Kurdek, 1989). The only study on relationship satisfaction predicting network structure, suggested that higher marital satisfaction was associated with bigger networks (Hansen et al., 1991).

Together, it appears that the effects of network structures may be highly sensitive to certain populations of egos, or certain types of alters, therefore fine-tuned analysis that evaluate moderators are needed. It is also possible that these associations have been difficult to determine because social network density is inversely related to network size ($r = -.57$ in Hirsch, 1980). Thus, if studies are not restricting networks to a particular size, or adjusting for this difference statistically, it makes significant effects much more difficult to find.

Alternatives. One's social network can provide access to potential alternative romantic partners as well as alternative non-romantic relationships that might compete with the romantic partner. With respect to romantic alternatives, prior research has consistently shown more higher quality romantic alternatives are associated with lower relationship satisfaction (Etcheverry, Le, Wu, & Wei, 2013; Lehmiller & Agnew, 2007; Scinta & Gable, 2007), network alters also perceive the couple to have lower relationship satisfaction (Etcheverry, Le, Wu, et al., 2013), and relationship dissolution is more likely (Etcheverry, Le, & Hoffman, 2013). With respect to non-romantic alternatives, those who receive support from non-romantic friends (Helms, Crouter, & McHale, 2003; Proulx, Helms, & Payne, 2004) or family (Hirsch & Rapkin, 1986), report lower relationship satisfaction, only if the support from the partner is low. Examinations of these associations as a feedback loop indicate that those who feel closer to their romantic partner, experience more jealousy toward both alternative potential romantic partners and their partner's non-romantic friends (Gomillion et al., 2014). In sum, individuals with networks containing more romantic and non-romantic alternative partners have worse relationship outcomes, however the prior research has not addressed how network structures might moderate the likelihood of being exposed to these network alternatives.

Online Network Involvement. A new area of research only garnering empirical attention in the last few years has been how couples' interactions with their online networks are associated with relationship satisfaction and stability. Results from these studies suggest that more time on social networking sites, or in online gaming is associated with lower relationship satisfaction (Dew & Tulane, 2015; Hand, Thomas, Buboltz, Deemer, & Buyanjargal, 2013; Valenzuela et al., 2014), and greater thoughts of divorce (Valenzuela et al., 2014). Likewise, lower relationship satisfaction is associated with more time spent gaming and on social network sites (Dew & Tulane, 2015). State-level research from the United States also indicates that states with a greater percentage of its population with Facebook accounts, have higher divorce rates (Valenzuela et al., 2014). The only finding counter to this pattern indicated that those who spent more time blogging, felt more connected to their extended social networks, which resulted in higher relationship satisfaction (McDaniel et al., 2012). Thus, it seems that time spent online that takes time away from the partner, may detract from relationship satisfaction, unless that time is spent directly building closeness with network members.

Norms. There has not been a lot of research evaluating whether one's social network prescribes norms for marriage and divorce, but the research that has been conducted on this topic has been highly consistent. Those with divorced parents (either from childhood or adulthood), report having less satisfying relationships (Timmer & Veroff, 2000; Timmer et al., 1996), and were more likely to divorce themselves (Booth et al., 1991; Orbuch et al., 2013). Those with divorced siblings were more likely to be divorced (Hogerbrugge et al., 2013). Those with divorced friends (Booth et al., 1991; Hogerbrugge et al., 2013; McDermott et al., 2013), or even divorced friends of friends (McDermott et al., 2013) were more likely to divorce themselves. And, the general rate of divorce in one's local community has also been associated with greater likelihood of divorce (Hogerbrugge et al., 2013). The reverse association has also been consistent, generally documenting homogeneity in social networks. Whereas married people are more likely to have other married people in their network (Kalmijn & Vermunt, 2007), single people are more likely to have other single people (Kalmijn & Vermunt, 2007), and divorced people are more likely

to have other divorced (Albeck & Kaydar, 2002; Kalmijn & Vermunt, 2007), single (Albeck & Kaydar, 2002) or widowed people in their network (Kalmijn & Vermunt, 2007). Thus, with respect to marital status, the literature supports the adage that ‘birds of a feather flock together.’

General Conclusion and Recommendations for Future Research

The primary goal of this review has been to understand how social networks exert their influence on the relationships embedded within them. Specifically, the goal has been to understand how and when compositional and structural social network elements help or hurt couples with maintaining a satisfying and stable relationship. To address this goal, we reviewed relevant theories, and provided an integrative model of these perspectives, and then reviewed the methods, and findings from previous research that address different aspects of this model. Results from this review indicate that supportive and approving networks that contain high quality relationships, especially with other happy married couples, are consistent correlates of happy and long-lasting relationships. The prior research has also provided strong evidence for a feedback loop, with nearly fifty percent of the studies examining the association from relationship status or satisfaction to network composition and structure. This review also highlights several areas of research that deserve further attention.

Describing couples’ social networks. Most research on the social resources of couples has examined perceptions of social networks globally, perceptions of only a few individual social network members, or perceptions from only a few individuals of their networks. In contrast, there have been very few studies that examine multiple alters within multiple people’s social networks simultaneously. Indeed, in the 118 studies included in the present review, there were only five that included at least 20 network alters (i.e., the minimum number recommended to study aspects of social network structure; Golinelli et al., 2010; McCarty et al., 2007) and at least 50 egos (i.e., the number needed to detect at least medium to large sized effects; Cohen, 1988). Therefore, a critical next step for this area of research is to describe what the range of couple’s full social networks look like. This is especially important given recent

analytic advancements that make it easier to collect and analyze social network data (e.g., Ucinet; Borgatti, Everett, & Freeman, 2002; or Gephi; Bastian, Heymann, & Jacomy, 2009), and study duo-centered social networks in particular (Kennedy et al., 2015). Given these advancements, now is an ideal time to begin answering basic questions that we still do not know about the networks of couples. These can include: How big are couples joint networks? What types of relationships are contained within them? How much overlap and density do most couples see in their own and shared networks? All of these questions (among numerous others) can help direct future research as to the important elements of networks that should be followed up with in future analyses.

Examining social network structure. One of the primary benefits of a social network perspective is the possibility to examine social network structures. However, only 5% of the prior literature on networks and relationships has examined the association between network structure and relationships. Moreover, of the 12 studies reporting effects of network structure, 1 did not even collect any network structure data, 4 included less than 10 alters in the network, and only 1 included the recommended minimum of 20 alters, only 4 collected data from both partners, only 3 examined the structure as a predictor of relationship outcomes, and only 1 was published in the last fifteen years. In sum, the assessment of social network structure has been highly lacking, and highly limited in the prior research. Failing to capitalize on the primary reason for studying social networks, the ability to examine its structure, is probably the biggest limitation of prior research in this field, but provides a clear directive for future research. For example, although research has clearly supported the idea that more support and more approval from the network is associated with better relationship outcomes, we do not know much about how supportive and approving network members are connected to other people in the network, and whether their structural position influences relationship outcomes. For example, does a network with a highly disapproving high degree alter outweigh the benefits of an otherwise approving network? Structure may also influence other mechanisms of network influence, such as access to alternatives, the strength of norming influence from close and peripheral alters, etc. Future research should begin to unpack these

elements of social networks, and capitalize of the benefits of a social network approach: the ability to study its underlying social structure.

Longitudinal perspectives on networks and relationships. The broader research on relationships (i.e., Karney & Bradbury, 1995), and broader research on social networks (i.e., Kossinets & Watts, 2006), have each repeatedly emphasized that relationships and social networks are dynamic, evolving over time, in different contexts, and with different people. However, when these two bodies of research are brought together, the majority of studies are cross-sectional designs. And even in most of the longitudinal studies, analyses only reported cross-sectional associations, or effects on levels and not change over time. In the present review, a few studies examined how the network at one point in time could influence the course of the relationship over time (e.g., Reczek et al., 2010), and a few studies examined how changes in the network over time were associated with the relationship status or satisfaction at one time (e.g., McDermott et al., 2013). However, there were few that fit even these conditions, and there has yet to be a single study examining both social networks and relationships as they change over time together. This is a clear priority for future research to address, as our theories highlight that these associations should evolve over time, but we do not know the direction of the associations. Do social networks have more influence on subsequent relationship outcomes, or do relationships have more influence on subsequent social network composition and structure? Or if both are true, what are the circumstances that explain when each will occur?

Testing moderation. Much of the prior research has relied on samples of convenience, especially University students, or middle-class White couples, as research on relationships often has done (i.e., Karney & Bradbury, 1995). Because some of the findings from these studies have been inconsistent (i.e., more time together and more family is not always better or worse for relationships), it is likely that unexamined moderators may explain these. A goal for future research is to examine whether social networks are inherently different for couples marrying young versus later in life, from rural or urban environments, from close or conflict-driven families, or a plethora of other potential moderators. It is

possible that the composition and structure of these couples' networks will vary, as well as the very way these processes are experienced across different populations. This is a possibility that future research should examine.

Concluding remarks. The growing interest and access to our social networks has changed the way we communicate with others and experience our social environment (McPherson et al., 2006). At the same time, how couples meet their partners has also been changing (Paul, 2014), moving away from traditional means of meeting via social networks and toward more anonymous settings, such as bars, clubs, and online dating services. During these cultural shifts, there has also been a growing shift in research attention toward how social networks and relationships affect one another. In the theories reviewed in the present manuscript, we documented that a variety of mechanisms are likely to be influencing the quality and stability of relationships, but only a few have dominated the research in this field (i.e., support and approval). We encourage future researchers to direct attention toward the other mechanisms outlined as well, and to examine these associations over time, and in large and diverse samples with both partners present. If future methodologically rigorous research can confirm that the social networks of couples have consistent and lasting positive influence on their relationship outcomes, there could be important policy implications. Instead of teaching couples that they alone have the power to solve their problems, we could encourage couples to look out to their social environment, and ensure they have surrounded themselves with the people most likely to help them succeed.

Table 1. Networks as a burden or boon for relationships

Mechanisms	Network Helps Marriage Quality & Stability	Network Hurts Marriage Quality & Stability
Support	<ul style="list-style-type: none"> - Network provides emotional support - Network provides practical support - Perceptions of support availability - Networks with high density, or high-degree alters may facilitate spread of needed support 	<ul style="list-style-type: none"> - Network requires emotional support - Network requires practical support - Consequences of receiving support (i.e., indebtedness, dependence/incapable) - Low density networks may fall short
Approval	<ul style="list-style-type: none"> - Network approving of the marriage may increase commitment to partner - “Romeo & Juliet” family disapproval may increase psychological reactance and improve commitment to partner 	<ul style="list-style-type: none"> - Disapproval may make partners question their marriage - Disapproval may disconnect partners from their networks leaving them isolated - Disapproval may fuel greater commitment to an unworthy partner
Quality	<ul style="list-style-type: none"> - Positive relationships with others can improve mood for interactions with partner - Quality shared ties may make benefits multiplicative 	<ul style="list-style-type: none"> - Negative interactions with others can spillover into the relationship - Discordant relationships between spouses and a network member may create distance
Norms	<ul style="list-style-type: none"> - Network provides role models for marriage - Network provides role models for parenting 	<ul style="list-style-type: none"> - Network provides role models for staying single - Network provides role models for divorce
Alternatives	<ul style="list-style-type: none"> - High overlap may prevent opportunities for meeting alternative others (boon for stability in particular) - Closeness with others in network may remove pressure from partner to fulfill multiple roles 	<ul style="list-style-type: none"> - High overlap may prevent opportunities for meeting alternative others in the face of a poor marriage - Closeness with others may create distance between partners - Ex-partners in the network, or single opposite-sex partners may encourage extra-marital affairs (emotional or physical)
Constraint	<ul style="list-style-type: none"> - High overlap may keep partners connected so not to lose access to shared ties (boon for stability, not necessarily quality) 	<ul style="list-style-type: none"> - High overlap may keep you connected to a poor partner (poor for quality, not necessarily stability)

Table 2. Studies of Social Networks and Intimate Relationships (N=125 studies)

Study	N Egos	N Alters	Relationship Studied	Network Variables Analyzed	Relationship Variables Analyzed	Outcome Variable	Methodological Limitations^a
Ackerman (1963)	-	-	Not specified	Constraint	Relationship Status	Network	1, 2, 3, 4, 5, 6, 7
Albech & Kaydar (2002)	77	13	Divorced	Constraint Norms Structure Times Spent Together Support	Relationship Status	Relationship	3, 4, 7
Andres (2014)	153	-	Not specified	Support	Satisfaction Relationship Status	Relationship	2, 3, 5, 6, 7, 8, 9
Barton, Futris & Nielsen (2014)	492	-	Married	Approval Constraint Support	Satisfaction	Network	3, 5, 6, 7, 8
Baxter & Widenmann (1993)	101	-	Not specified	Support	Satisfaction	Network	2, 3, 4, 5, 6, 7, 8
Beach, Arias & O'Leary (1986)	267	-	Married	Time Spent Together	Satisfaction	Relationship	5, 6, 7, 8
Bertoni & Bodenmann (2010)	452	-	Married	Quality	Satisfaction	Network	5, 6, 7, 8
Blair & Holmberg (2008)	458	-	Not specified	Support	Satisfaction	Relationship	2, 3, 4, 5, 6, 7, 8
Blood (1969)	731	-	Married	Support Time Spent Together	Satisfaction	Relationship	3, 5, 6, 7, 8
Booth, Edwards & Johnson (1991)	1742	-	Married	Constraint Friend/Family Composition Norms Support	Satisfaction	Relationship	3, 5, 6, 7, 8, 9
Brody, Litvin, Hoffman & Kleban (1995)	522	-	Not specified	Support	Relationship Status	Network	2, 3, 5, 6, 7, 8
Bryan, Fitzpatrick, Crawford & Fischer (2001)	162	2	Not specified	Support	Satisfaction	Relationship	2, 3, 4, 6, 7, 8
Bryant & Conger (1999)	795	-	Not specified	Approval Quality Support	Satisfaction	Network Relationship	
Bryant, Conger & Meehan (2001)	823	2	Married	Quality	Satisfaction Change in Satisfaction	Network Relationship	4, 6, 7, 8, 9
Burger & Milardo (1995)	50	22	Married	Time Spent Together	Satisfaction	Relationship	7, 8
Busby, Boden, Niehuis, Reifman & Fitzpatrick (2015)	2864	-	Married	Approval	Satisfaction	Relationship	5, 6, 7, 8

Study	N Egos	N Alters	Relationship Studied	Network Variables Analyzed	Relationship Variables Analyzed	Outcome Variable	Methodological Limitations^a
Canary & Stafford (2002)	220	-	Married	Time Spent Together	Commitment	Relationship	4, 5, 6, 7, 8
Caron & Ulin (1997)	124	-	Not specified	Approval Quality Support	Satisfaction	Relationship	2, 3, 4, 5, 6, 7, 8
Cotten (1998)*	3617	-	Not specified	Support	Relationship Status	Network	2, 3, 5, 6, 7, 8
Cottton, Burton & Rushing (2003)*	1977	-	Married	Support	Satisfaction	Relationship	3, 5, 6, 7, 8
Cotton, Cunningham & Antill (1993)	332	6	Married	Constraint Friend/Family Composition Support	Satisfaction	Relationship	6, 7
Coward (1987)	900	2	Not specified	Support	Relationship Status	Network	2, 3, 6, 7, 8, 9
Cox, Wexler, Rusbult & Gaines (1997)	173	-	Not specified	Approval	Commitment Satisfaction Relationship Status	Relationship	2, 3, 4, 5, 6, 7, 8, 9
Dailey, Brody & Knapp (2015)	460	1	Not specified	Approval Support	Relationship Status Satisfaction	Network Relationship	2, 3, 4, 6, 8
Dainton (2015)	90	-	Married	Support	Satisfaction	Relationship	3, 5, 6, 7, 8
Demir (2010)	311	4	Not specified	Support	Satisfaction	Relationship	2, 3, 4, 6, 7, 8
Dew & Tulane (2015)	2736	-	Married	Online Network	Satisfaction	Network Relationship	5, 6, 7, 8, 9
Dindia & Baxter (1987)	100	-	Married	Time Spent Together	Satisfaction	Network	5, 6, 7, 8
Driscoll, Davis & Lipetz (1972)	140	-	Not specified	Approval	Satisfaction	Relationship	2, 3, 5, 6, 7, 8, 9
Etcheverry & Agnew (2004)	301	7	Dating	Approval	Relationship Status	Relationship	3, 4, 6, 7, 8, 9
Etcheverry, Le & Charania (2008)	254	2	Dating	Approval	Satisfaction Relationship Status	Network Relationship	3, 4, 6, 8, 9
Etcheverry, Le & Hoffman (2013) Study 1	1274	1	Not specified	Alternatives Approval	Satisfaction	Network	2, 3, 4, 6, 8
Etcheverry, Le & Hoffman (2013) Study 2	48	1	Not specified	Approval	Satisfaction	Network	1, 2, 3, 4, 6, 8
Etcheverry, Le & Hoffman (2013) Study 3	44	1	Not specified	Approval	Satisfaction	Network	1, 2, 3, 4, 6, 8
Etcheverry, Le, Wu & Wei (2013) Study 1	334	-	Not specified	Alternatives	Satisfaction	Relationship	2, 3, 4, 5, 6, 7, 8
Etcheverry, Le, Wu & Wei (2013) Study 2	205	-	Not specified	Alternatives	Satisfaction	Relationship	2, 3, 4, 5, 6, 7, 8

Study	N Egos	N Alters	Relationship Studied	Network Variables Analyzed	Relationship Variables Analyzed	Outcome Variable	Methodological Limitations^a
Etcheverry, Le, Wu & Wei (2013) Study 3	395	-	Not specified	Alternatives	Relationship Status	Relationship	2, 3, 5, 6, 7, 8
Felmlee (2001)	290	-	Not specified	Approval	Relationship Status	Relationship	2, 3, 4, 5, 6, 7
Felmlee, Sprecher & Bassin (1990)	445	-	Not specified	Approval	Relationship Status	Relationship	2, 3, 4, 5, 6, 7
Fischer, Sollie, Sorell & Green (1989)	159	31	Not specified	Friend/Family Composition Support	Relationship Status	Network	2, 3, 4, 7
Gerstel (1988)	104	18	Not specified	Friend/Family Composition Structure	Relationship Status	Network	2, 3, 4, 7
Gomillion, Gabriel & Murray (2014)	148	2	Not specified	Alternatives Quality	Satisfaction	Network	2, 3, 4, 6, 7, 8
Goodwin (2003)	247	-	Married	Support	Satisfaction	Relationship	3, 5, 6, 7, 8, 9
Gordon & Downing (1978)	686	6	Married	Constraint Family/Friend Composition	Satisfaction	Relationship	3, 5, 6, 7
Hand, Thomas, Buboltz, Deemer & Buyanjargal (2013)	233	-	Not specified	Online Network	Satisfaction	Relationship	2, 3, 4, 5, 6, 7, 8
Hansen, Fallon & Novotny (1991)	36	12	Married	Constraint Structure	Satisfaction	Network Relationship	1, 7
Hawkley, Hughes, Waite, Masi, Thisted et al. (2008)	229	-	Not specified	Support	Satisfaction	Network	2, 3, 6, 7
Helms, Crouter & McHale (2003)	284	1	Married	Alternatives	Satisfaction	Relationship	6, 7, 8
Hill (1988)	150	-	Married	Structure	Satisfaction	Relationship	3, 5, 6, 7, 8
Hirsch & Rapkin (1986)	235	5	Not specified	Alternatives	Satisfaction	Relationship	2, 3, 6, 7, 8
Hogerbrugge, Komter & Scheepers (2013)	4090	-	Not specified	Constraint Norms Support	Relationship Status	Relationship	2, 3, 5, 6, 7, 9
Holmberg & Blair (2016)	407	-	Not specified	Support	Satisfaction	Relationship	2, 3, 6, 7, 8
Jensen & Rauer (2014)	67	2	Not specified	Support	Relationship Status	Relationship	2, 3, 4, 6, 7, 8, 9
Jin & Oh (2010)	278	-	Not specified	Support Time Spent Together	Satisfaction	Relationship	2, 3, 5, 6, 7, 8
Johnson & Leslie (1982)*	410	7	Not specified	Approval Friend/Family Composition Support	Relationship Status	Network	2, 3, 4, 5, 6, 7, 8, 9

Study	N Egos	N Alters	Relationship Studied	Network Variables Analyzed	Relationship Variables Analyzed	Outcome Variable	Methodological Limitations^a
Johnson & Milardo (1984)*	434	7	Not specified	Approval	Change in Satisfaction Relationship Status	Network Relationship	2, 3, 4, 6, 7, 9
Jordan & Deluty (2000)	305	-	Not specified	Quality Support	Satisfaction	Relationship	2, 3, 5, 6, 7, 8
Julien & Markman (1991)	174	-	Married	Constraint Support Time Spent Together	Satisfaction	Network Relationship	6, 7
Julien, Chartrand & Begin (1999)	266	11	Not specified	Friend/Family Composition	Satisfaction	Relationship	2, 4
Julien, Markman, Leveille, Chartrand & Begin (1994)	28	1	Married	Approval	Satisfaction	Relationship	1, 3, 4, 6, 8
Julien, Tremblay, Belanger, Dube, Begin & Bouthillier (2000)	88	1	Married	Quality	Satisfaction	Network	3, 6, 8
Kalmijn (2003)*	2717	3	Not specified	Constraint Time Spent Together	Relationship Status	Network	2, 6, 7
Kalmijn & Bernasco (2001)*	1523	-	Not specified	Constraint	Relationship Status	Network	2, 5, 6, 7, 8
Kalmijn & van Groenou (2005)	2287	-	Not specified	Time Spent Together	Relationship Status	Network	2, 3, 5, 6, 7, 8
Kalmijn & Vermunt (2007)	875	9	Not specified	Norms	Relationship Status	Network	2, 3, 6, 7, 8
Kearns & Leonard (2004)	694	-	Newlyweds	Constraint	Satisfaction	Network Relationship	6, 7, 9
Kim & Stiff (1991)	190	6	Not specified	Constraint	Satisfaction	Relationship	2, 4, 6
Knobloch & Donovan-Kicken (2006)	260	5	Not specified	Approval	Satisfaction	Network	2, 3, 4, 6, 7, 8
Kurdek (1989)	854	72	Newlyweds	Structure	Relationship Status	Network	7, 8
Lehmiller & Agnew (2007)	215	-	Not specified	Alternatives Approval	Satisfaction Relationship Status	Relationship	2, 3, 5, 6, 7, 8, 9
Lehmiller & Agnew (2008)	194	-	Not specified	Approval	Commitment	Relationship	2, 3, 4, 5, 6, 7, 8, 9
Leiter & Durup (1996)	151	-	Not specified	Support	Satisfaction	Network Relationship	2, 3, 4, 5, 6, 7, 8, 9
Leslie & Grady (1985)	30	10	Divorced	Friend/Family Composition Structure	Relationship Status	Network	1, 3, 4, 5, 7

Study	N Egos	N Alters	Relationship Studied	Network Variables Analyzed	Relationship Variables Analyzed	Outcome Variable	Methodological Limitations ^a
				Support			
Leslie, Huston & Johnson (1986)	159	2	Not specified	Approval	Relationship Status	Network	2, 3, 4, 6, 7, 8
Levitt, Weber & Clark (1986)	43	13	Married	Support	Satisfaction	Network	1, 3, 7
Lewis (1973)	316	-	Not specified	Approval	Satisfaction	Relationship	2, 3, 4, 5, 6, 7, 8, 9
Loving (2006)	325	2	Dating	Friend/Family Composition	Relationship Status	Relationship	3, 4, 6, 8, 9
MacDonald, Marshall, Gere, Shimotomai & Lies (2012) Study 1	193	-	Not specified	Approval	Satisfaction	Relationship	2, 3, 4, 6, 7, 8
MacDonald, Marshall, Gere, Shimotomai & Lies (2012) Study 2	242	-	Not specified	Approval	Satisfaction	Relationship	2, 3, 4, 6, 7, 8
McDaniel, Coyne & Holmes (2012)	157	-	Married	Online Network Quality Support	Satisfaction	Relationship	3, 5, 6, 7, 8
McDermott, Fowler & Christakis (2013)	5124	11	Not specified	Friend/Family Composition Norms Structure	Relationship Status	Network Relationship	2, 3, 4, 9
Milardo (1982)*	89	14	Dating	Constraint	Relationship Status	Network	3, 4, 7, 9
Milardo, Johnson & Huston (1983)*	89	26	Dating	Time Spent Together	Relationship Status	Network	3, 4, 7, 8, 9
Neff & Karney (2004)	164	-	Newlyweds	Quality	Change in Satisfaction Satisfaction	Relationship	5, 6, 7, 8, 9
Nelson (1995)	90	14	Not specified	Friend/Family Composition Quality Structure Support	Relationship Status	Network	2, 3, 7, 9
Orbuch, Bauermeister, Brown & McKinley (2013)	746	-	Newlyweds	Constrain Norms	Relationship Status	Relationship	5, 6, 7, 8, 9
Parks, Stan & Eggert (1983)	193	24	Dating	Approval Constraint Quality	Satisfaction	Network Relationship	3, 4, 7, 8
Pittman & Lloyd (1988)	810	-	Not specified	Quality Support	Satisfaction	Relationship	2, 3, 5, 6, 7, 8

Study	N Egos	N Alters	Relationship Studied	Network Variables Analyzed	Relationship Variables Analyzed	Outcome Variable	Methodological Limitations ^a
				Time Spent Together			
Proulx, Helms, Milardo & Payne (2009)*	52	1	Married	Support	Satisfaction	Relationship	3, 4, 6, 7, 8
Proulx, Helms & Payne (2004)*	52	1	Married	Alternatives	Satisfaction	Relationship	3, 4, 6, 7, 8
Reczek, Liu & Umberson (2010) Study 1	336	1	Married	Quality Support	Change in Satisfaction	Relationship	3, 6, 7, 8, 9
Reczek, Liu & Umberson (2010) Study 2	520	1	Married	Quality Support	Satisfaction	Relationship	3, 6, 7, 8, 9
Rodriguez, Helms, Supple & Hengstebeck (2014)	240	1	Married	Support	Satisfaction	Relationship	6, 7, 8, 9
Rogler & Procidano (1986)	400	8	Married	Structure	Satisfaction	Relationship	4, 6, 7
Røsand, Slinning, Røysamb & Tambs (2014)	18523	-	Not specified	Quality	Relationship Status	Relationship	2, 5, 6, 7, 8, 9
Sarkisian & Gerstel (2015) Study 1	5572	-	Not specified	Time Spent Together	Relationship Status	Network	2, 3, 5, 6, 7, 8, 9
Sarkisian & Gerstel (2015) Study 2	10005	-	Not specified	Support	Relationship Status	Network	2, 3, 5, 6, 7, 8, 9
Scinta & Gable (2007) Study 1	51	-	Dating	Time Spent Together	Satisfaction	Relationship	3, 4, 5, 6, 7, 8, 9
Scinta & Gable (2007) Study 2	81	-	Dating	Alternatives	Satisfaction	Relationship	4, 5, 6, 7, 8, 9
Seal, Doherty & Harris (2015)	1000	-	Not specified	Support	Relationship Status	Network	2, 3, 5, 6, 7, 8
Sinclair, Felmlee, Sprecher & Wright (2015) Study 1	228	2	Single	Approval	Satisfaction	Relationship	3, 4, 6, 7, 8
Sinclair, Felmlee, Sprecher & Wright (2015) Study 2	858	4	Dating	Approval	Satisfaction	Relationship	3, 4, 5, 6, 7, 8
Sinclair, Felmlee, Sprecher & Wright (2015) Study 3	340	2	Not specified	Approval	Commitment	Relationship	2, 3, 4, 6, 7, 8
Sinclair, Hood, & Wright (2014)	396	-	Not specified	Approval	Change in Satisfaction	Relationship	2, 3, 5, 6, 7, 8
Slatcher (2010)	120	2	Dating	Quality	Satisfaction	Relationship	5, 6, 8, 9
Sprecher & Felmlee (1992)*	202	-	Dating	Approval	Satisfaction	Relationship	4, 5, 6, 7, 8, 9

Study	N Egos	N Alters	Relationship Studied	Network Variables Analyzed	Relationship Variables Analyzed	Outcome Variable	Methodological Limitations^a
				Support	Relationship Status		
Sprecher & Feilmlee (2000)*	202	-	Dating	Approval Quality	Relationship Status	Network Relationship	4, 5, 6, 7, 8, 9
Stafford & Canary (1991)	956	-	Not specified	Time Spent Together	Relationship Status	Network	2, 3, 4, 5, 6, 7, 8
Stein, Bush, Ross & Ward (1992)	98	18	Married	Constraint	Satisfaction	Relationship	7
Surra (1985)	100	-	Newlyweds	Time Spent Together	Relationship Status	Network	3, 5, 6, 7, 8
Surra, Arizzi & Asmussen (1988)	39	-	Newlyweds	Approval	Satisfaction	Relationship	1, 3, 4, 5, 6, 7, 8
Taylor, Brown, Chatters & Lincoln (2012)	5191	-	Not specified	Quality Support	Satisfaction	Relationship	2, 5, 6, 7, 8, 9
Tietjen (1985)	80	6	Not specified	Support	Relationship Status	Network	2, 3, 6, 7, 8
Timmer & Veroff (2000)*	746	-	Married	Constraint Norms	Change in Satisfaction Relationship Status Satisfaction	Relationship	3, 5, 6, 7, 8, 9
Timmer, Veroff & Hatchett (1996)*	251	-	Married	Constraint Friend/Family Composition Norms	Satisfaction	Relationship	3, 5, 6, 7, 8, 9
Turner & Marino (1994)	1394	-	Not specified	Support	Relationship Status	Network	2, 3, 5, 6, 7, 8, 9
Udry & Hall (1965)	86	4	Not specified	Structure	Satisfaction	Relationship	2, 4, 6, 8
Valenzuela, Halpern & Katz (2014) Study 1	1160	-	Married	Online Network	Relationship Status Satisfaction	Relationship	3, 5, 6, 7, 8, 9
Valenzuela, Halpern & Katz (2014) Study 2	-	-	Not specified	Online Network	Relationship Status	Relationship	1, 2, 3, 5, 6, 7, 8, 9
Voydanoff (2005)	1816	-	Not specified	Support	Satisfaction	Relationship	2, 3, 5, 6, 7, 8
Walker, Isherwood, Burton, Kitwe-Magambo & Luszcz (2013)	80	-	Married	Quality	Satisfaction	Relationship	5, 6, 7, 8
Welker, Baker, Padilla, Holmes, Aron & Slatcher (2014) Study 1	124	2	Not specified	Quality	Satisfaction	Relationship	2, 4, 5, 6, 7, 8
Welker, Baker, Padilla, Holmes, Aron & Slatcher (2014) Study 2	176	1	Not specified	Time Spent Together	Satisfaction	Relationship	2, 4, 6, 7, 8
Wellman, Wong, Tindall & Nazer (1997)	33	6	Not specified	Structure	Relationship Status	Network	1, 2, 3, 6, 7, 9

Study	N Egos	N Alters	Relationship Studied	Network Variables Analyzed	Relationship Variables Analyzed	Outcome Variable	Methodological Limitations^a
White & Booth (1991)	1341	-	Married	Constraint	Relationship Status	Relationship Network	3, 5, 6, 7, 8, 9
Widmer, Giudici, Le Goff & Pollien (2009)	2178	4	Not specified	Approval Quality	Relationship Status Satisfaction	Relationship	2, 5, 6, 7, 8, 9
Widmer, Kellerhals & Levy (2004)	1820	4	Not specified	Quality	Satisfaction	Relationship	2, 5, 6, 7, 8
Wright & Sinclair (2012)	228	-	Single	Approval	Satisfaction	Relationship	3, 4, 6, 7, 8, 9

Note. Dashes indicate information was unavailable or not reported. Asterisks indicate the study made use of a data set also used in another published paper.

^a 1. Less than 50 egos assessed. 2. Relationship studied not specified. 3. Assessed individuals only. 4. Sample of convenience. 5. No assessment of specific alter characteristics. 6. Less than 5 alters assessed. 7. No data from alters. 8. No measures of network structure. 9. Cross-sectional design.

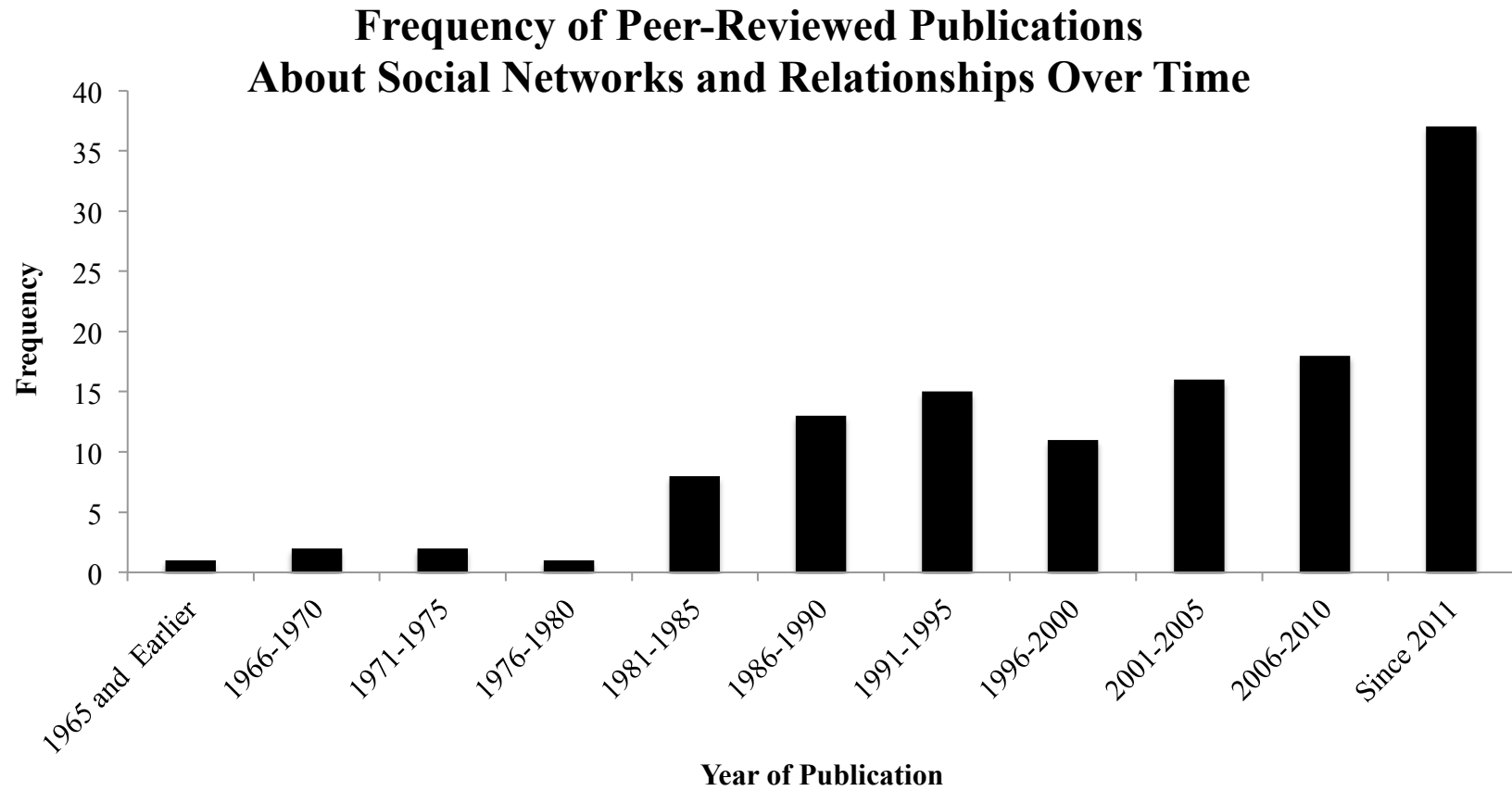


Figure 1. Frequency of peer-reviewed publications about social networks and relationships over time (N=125 studies)

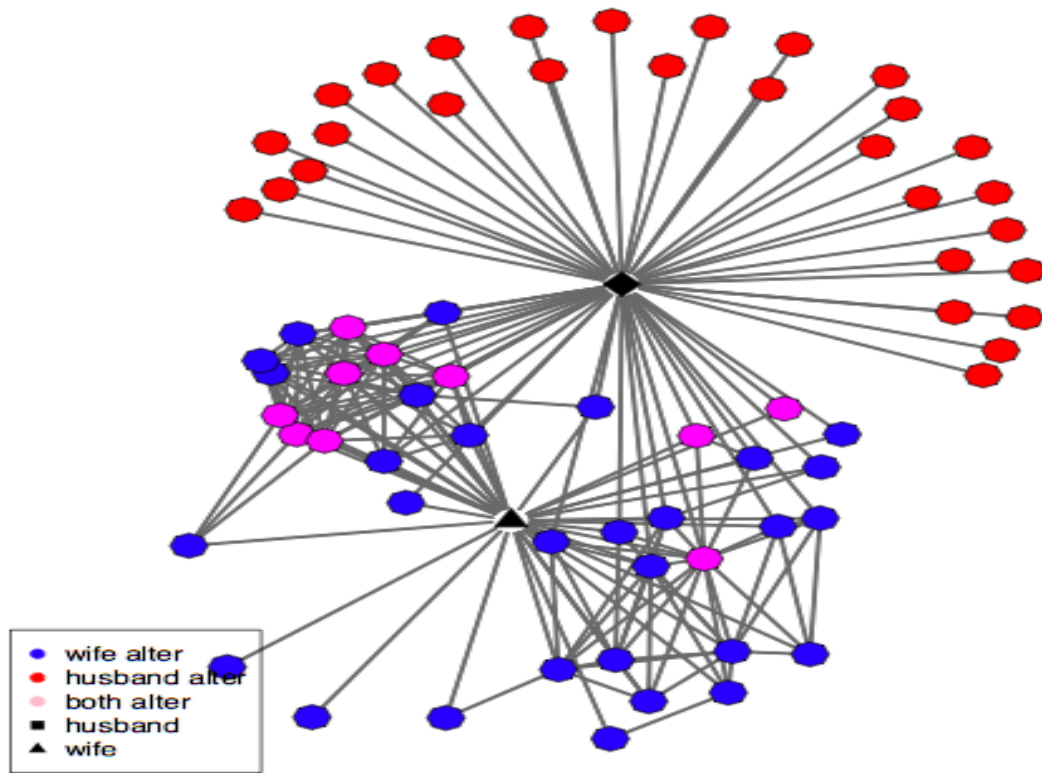


Figure 2. Sample Duo-Centered Social Network.

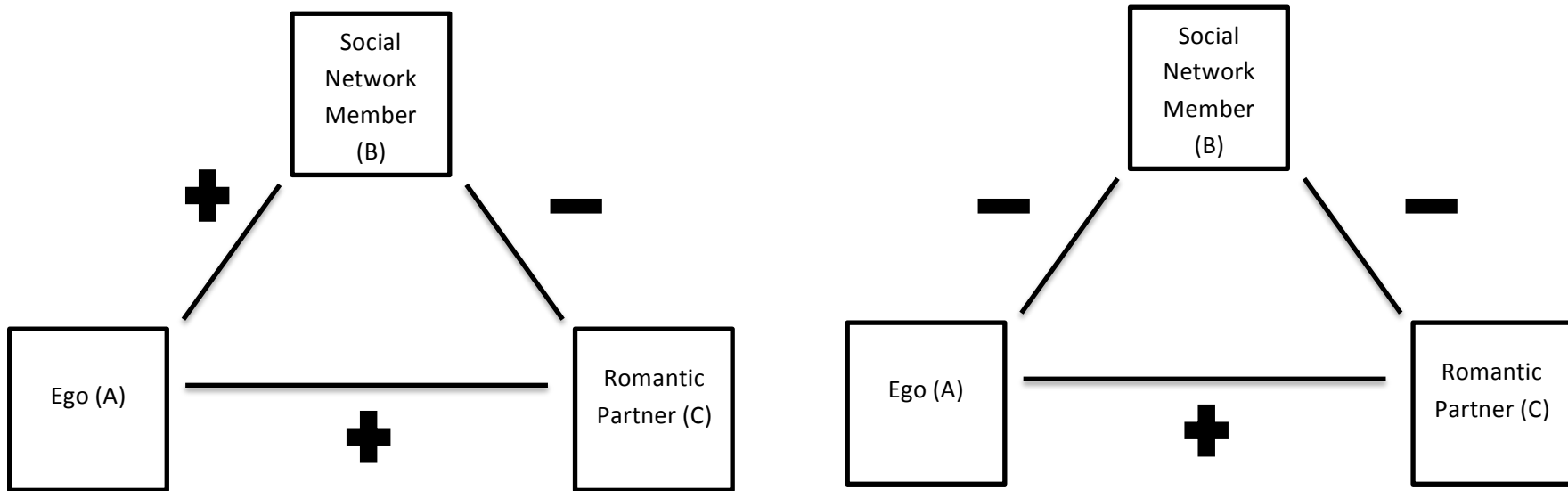


Figure 3. Balance Theory Example (Kearns & Leonard, 2004). The triad on the left is unbalanced, such that two people the ego (A) has a positive relationship with (B and C), do not like each other. The only way the ego can resolve this is by disconnecting from the network member (B) or the partner (C). The triad on the right is balanced (i.e., the enemy of my enemy is my friend).

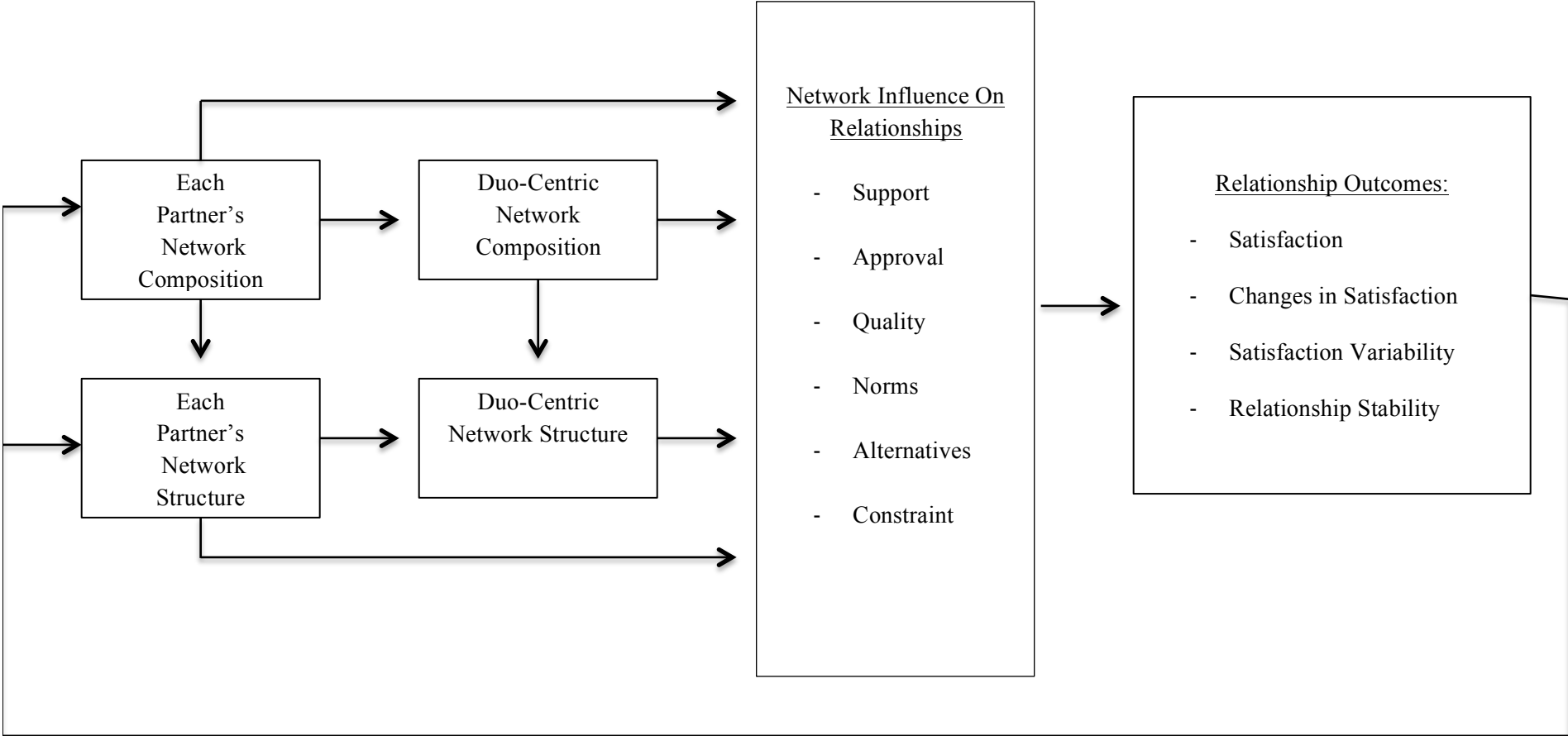


Figure 4. Social Network and Relationship Outcome Process Model.

% Frequency of Each Error Made in Prior Studies

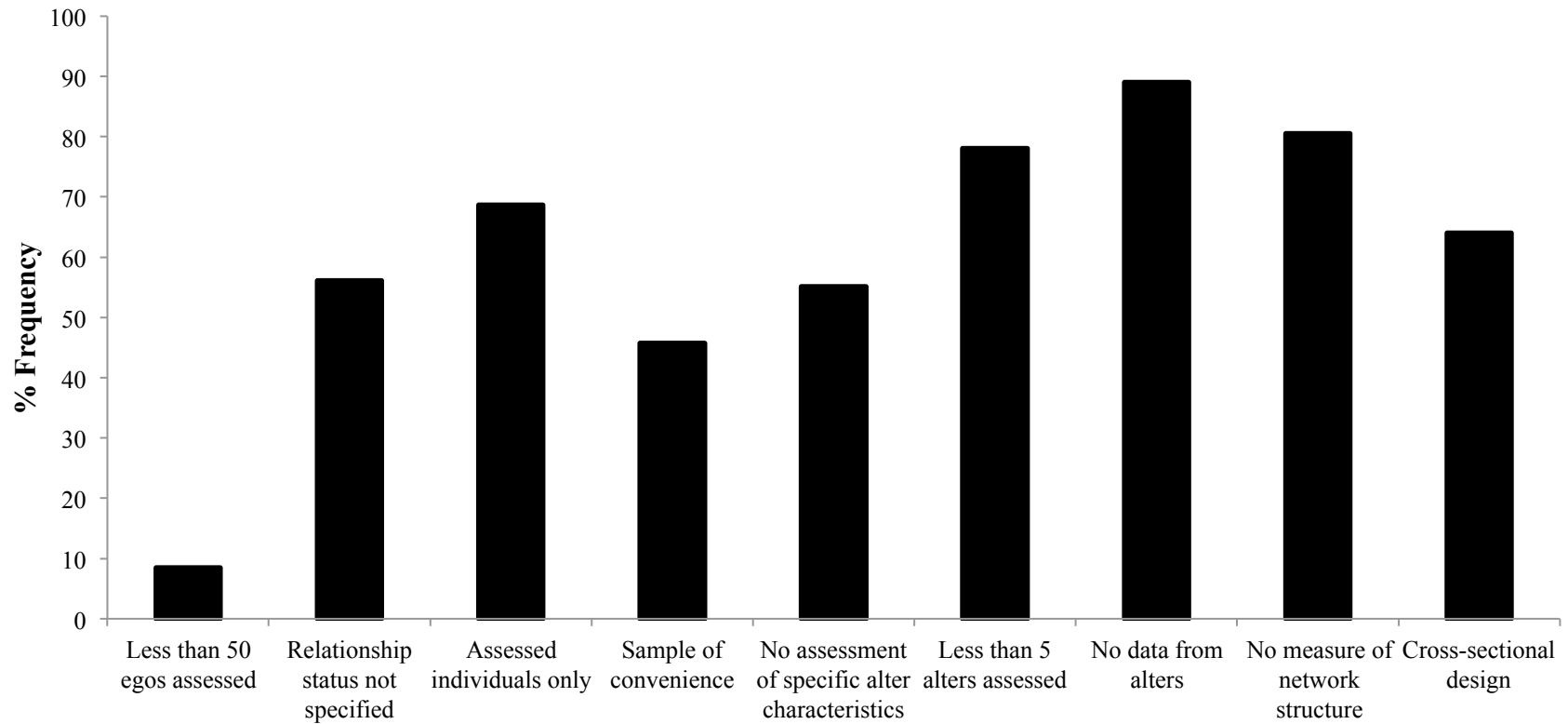


Figure 5. Frequency of each error made across the 118 independent studies in the prior literature. If data was unavailable for any particular error it was included as a limitation for that study.

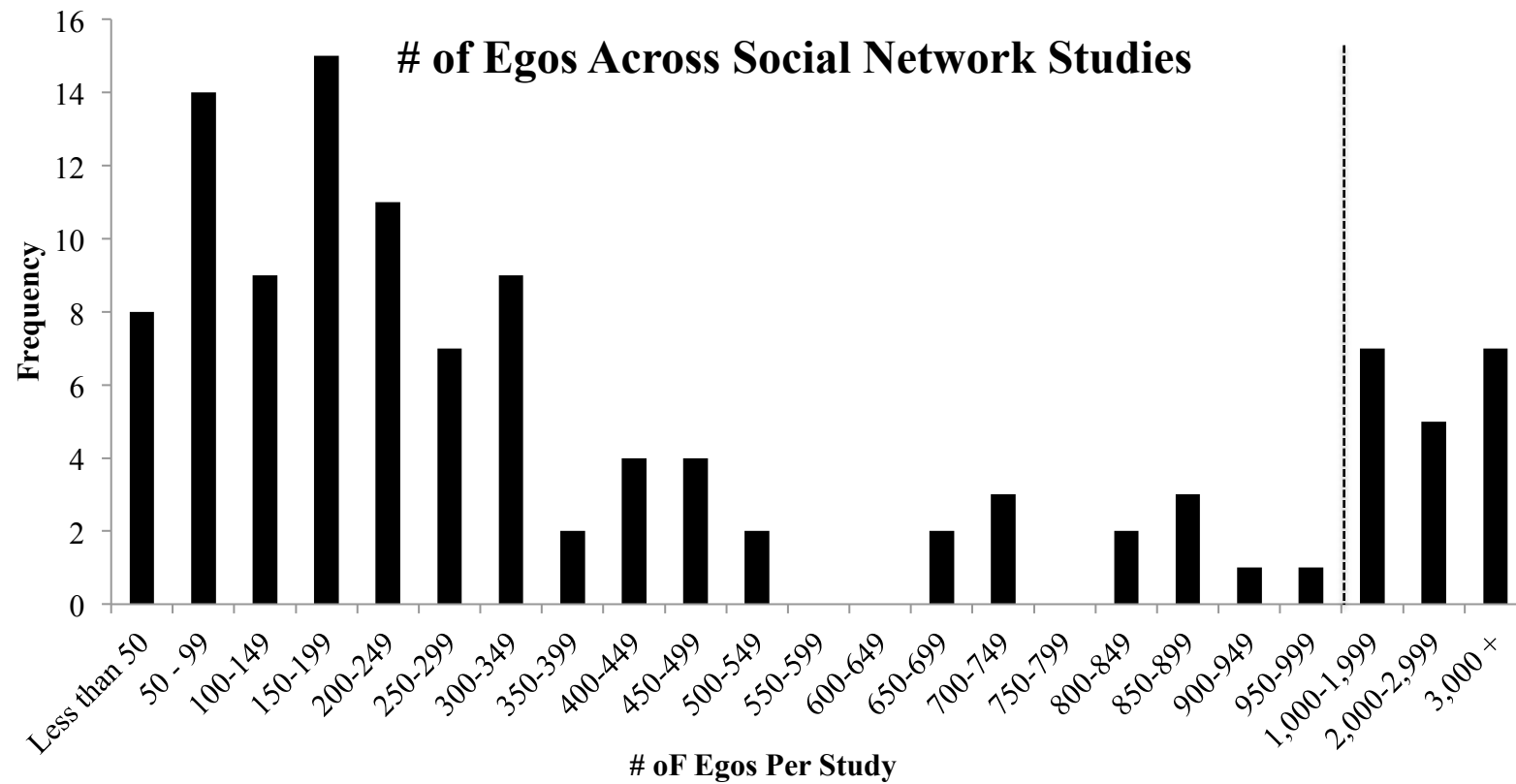


Figure 6. Frequency distribution of the # of egos per study across the 116 independent studies with available ego data ($N_{\text{missing}} = 2$ studies).

% Frequency of Relationship Statuses Represented in Prior Studies

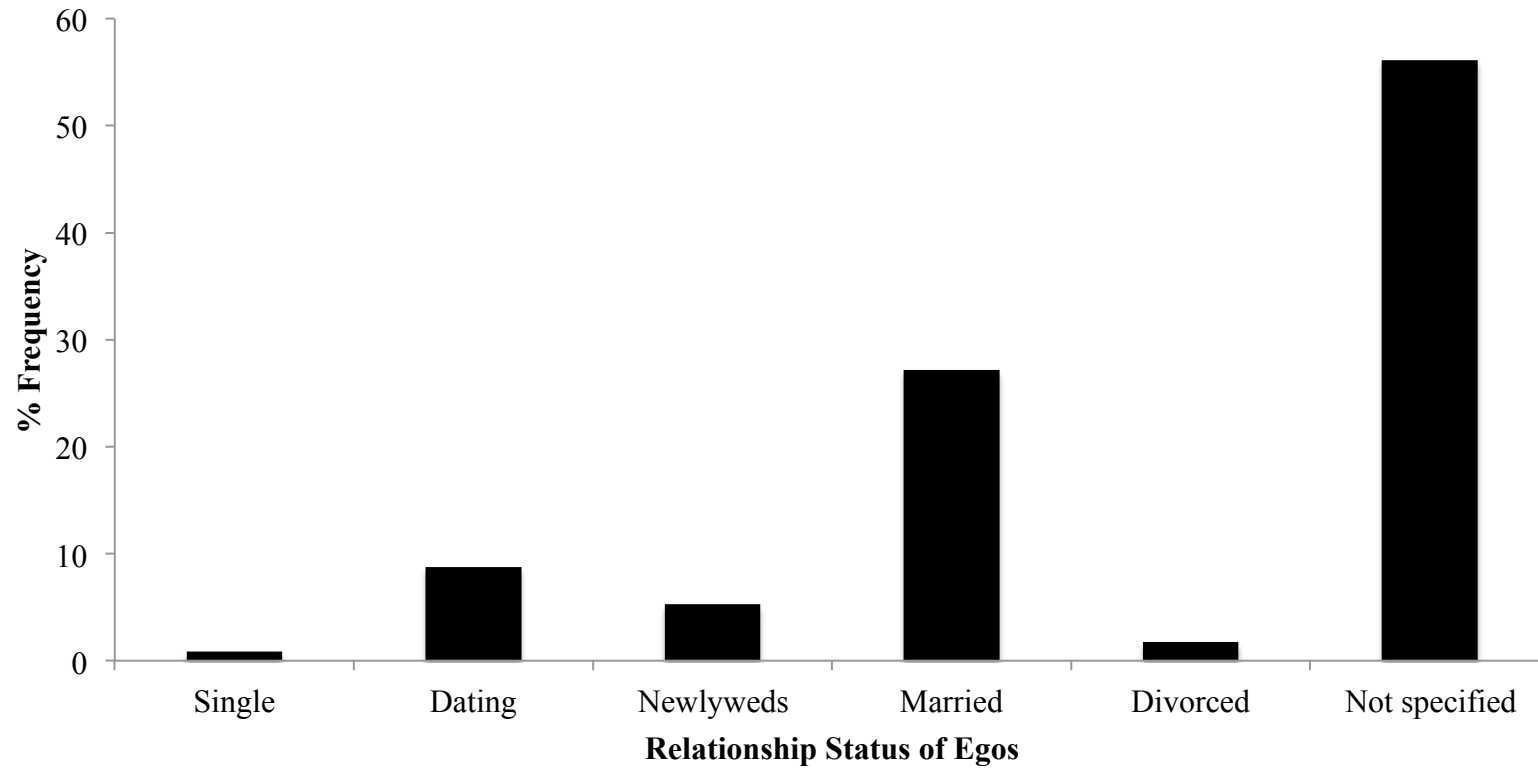


Figure 7. The relationship status of participants across the 118 independent studies in prior literature.

of Alters Across Social Network Studies

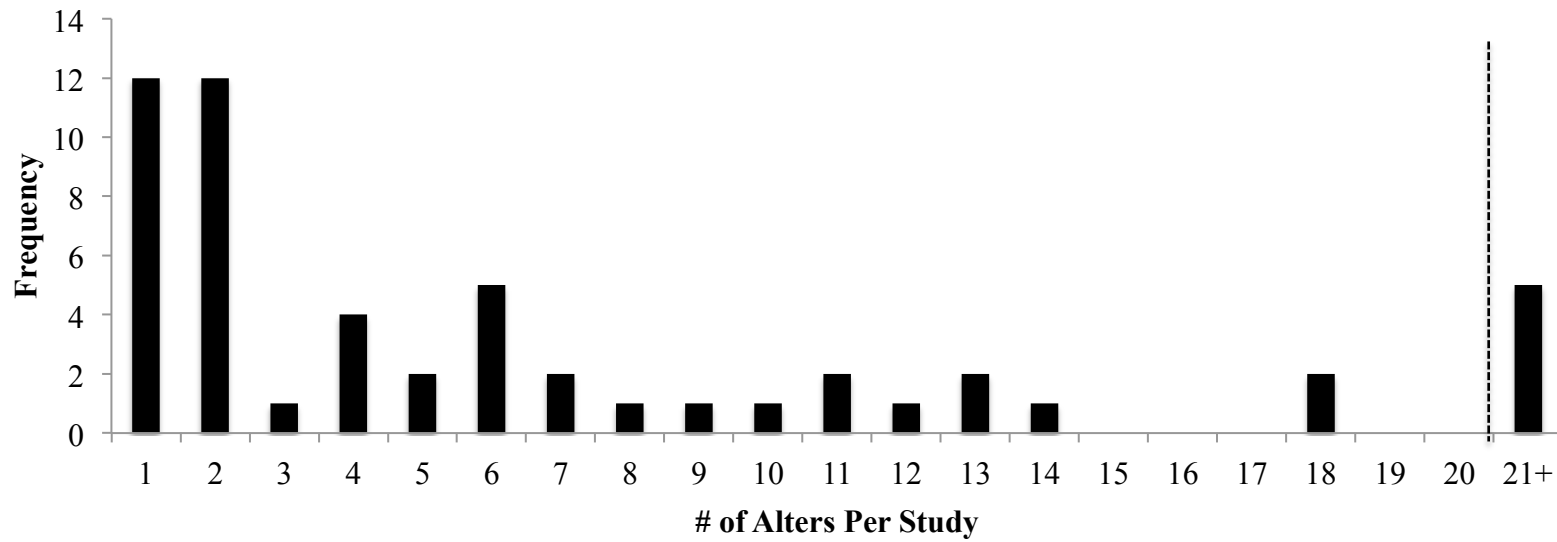


Figure 8. Frequency distribution of the # of alters per study across the 54 independent studies with available alter data ($N_{\text{missing}} = 64$ studies).

Categorizing Research on Social Networks and Relationships By Topic

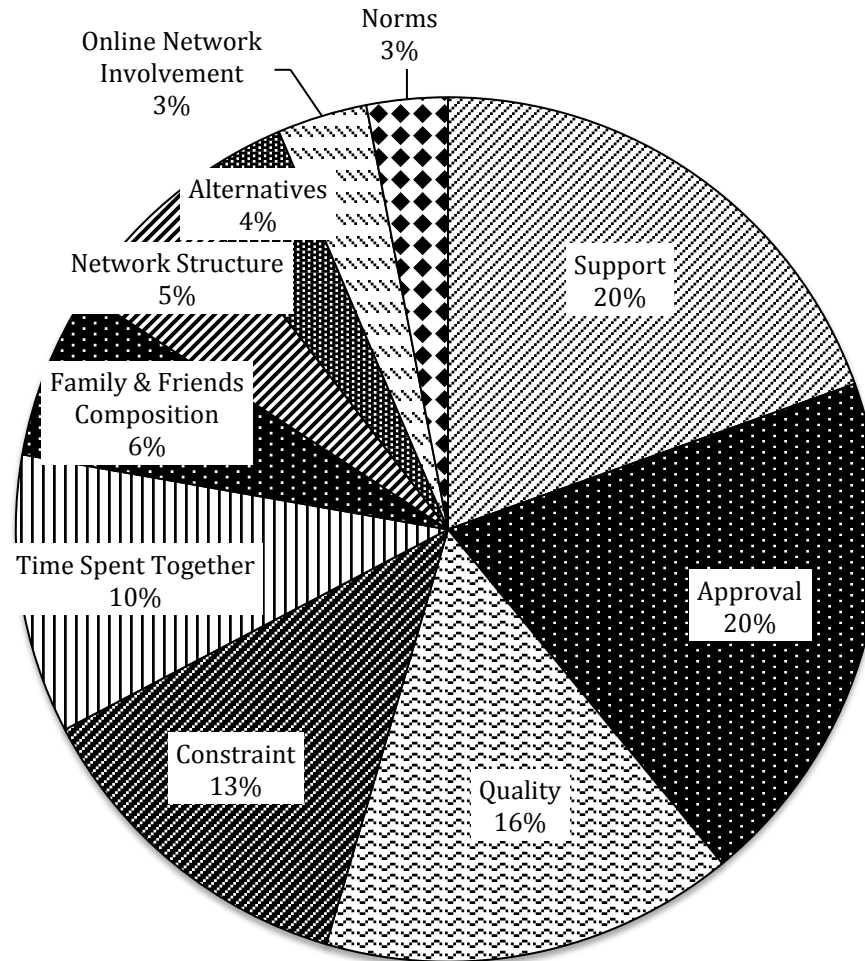


Figure 9. Mechanisms of influence in research on social networks and relationships across the 297 findings included in the 118 independent studies in prior literature.

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Effects of Premarital Courtship Experiences on Newlywed's Subsequent Marital Outcomes

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Preparation of this report was supported by research grants from the Fetzer Institute "Memory bias in early marriage" and "Compassionate love and social support in early marriage" and the National Institute of Mental Health MH59712 awarded to Benjamin R. Karney in 2000, 2003, and 2004 respectively, as well as a National Institute of Mental Health Grant MH48674 awarded to Thomas N. Bradbury. We gratefully acknowledge the crucial assistance of Jenni Fiederer, Lori Hinckley, Atina Manvelian, Danny Martinez, Robert Paul, Kevin Shaw, Van Tran, Stephanie Tuncel and Jessica Wibawa for their assistance in coding.

Abstract

Do the details of couples' premarital courtship predict their post-marital satisfaction and stability? To address this question, we examined how 4-year marital satisfaction trajectories and divorce rates gathered in 4 independent longitudinal studies of newlywed couples (total N=483, or 966 individuals) were predicted by 1) where couples met, 2) the length of each stage of their courtship, 3) whether partners were friends before they began dating and 4) whether partners cohabited prior to marriage. Across studies, approximately half of couples met through a shared environment (e.g., work, school, or church), one-third through a social network member, and the remaining through a chance encounter or dating service; couples knew each other about a year before dating, dated for 2 years, and were engaged for another year before marriage (for a total of 4 years of courtship on average); about one half of couples were friends before dating; and about one half of couples cohabited prior to marriage. Across all four studies, these elements of courtship were independent of spouses' age, education, parental divorce, prior relationships, self-esteem and personality. Across all four studies, these courtship experiences did not significantly account for divorce, initial marital satisfaction, or slopes of satisfaction over the first four years of marriage. Thus, although folk wisdom and several theories of relationship development suggest that different courtship experiences have meaningful implications for subsequent marital success and failure, instead it appears that all roads are equally likely to lead to romance.

KEYWORDS: Longitudinal; Marital Satisfaction; Courtship; Cohabitation; Dating

Effects of Premarital Courtship Experiences on Newlywed's Subsequent Marital Outcomes

On the path to marriage, partners have to make a number of crucial decisions. Should I date my best friend? Should I move in with my partner? When should we get engaged? These decisions can be agonizing because partners do not want to make a choice that might have negative consequences for the relationship down the road. Scholars have pondered these same questions, examining whether the course of couples' path to marriage predicts their likelihood of marital success. Much of the research on this issue has asked currently married spouses to describe the development of their relationship prior to their marriage. Research that has assessed spouses' retrospective evaluations of their premarital relationship shows that couples who report conflict before their marriage also report more relationship difficulty during marriage (Kelly, Huston, & Cate, 1985; Markman, 1981). Research that has asked partners to describe the development of passion throughout their courtship (i.e., Huston, Surra, Fitzgerald, & Cate, 1981; Surra, 1985) finds that passion during courtship is associated with greater expressions of affection during marriage (Niehuis, Reifman, Feng, & Huston, 2014). Prior research has also examined the way couples discuss their courtship, e.g., how couples collaborate in jointly telling their story. These aspects of relational story-telling have been associated with commitment and marital satisfaction in samples of established married couples (Buehlman, Gottman, & Katz, 1992) and newlyweds (Carrere, Buehlman, Gottman, Coan, & Ruckstuhl, 2000; Veroff, Sutherland, Chadiha, & Ortega, 1993).

Studies such as these reveal associations between memories, narratives, and marital outcomes, but they do not speak directly to the implications of specific courtship experiences, in part because retrospective appraisals of the premarital relationship and the way partners interact in talking about their history are both likely to share variance with assessments of present

satisfaction and commitment. Understanding whether decisions that couples make on the way to their wedding predict the subsequent longevity and quality of their marriage requires research that assesses aspects of premarital courtship unlikely to be shaped by current feelings about the relationship. The goal of the present investigation is to examine these aspects of premarital courtship, and their associations with subsequent marital quality and stability.

How Premarital Courtship May Effect Marital Outcomes

The advice column on the e-Harmony web site (n.d.) asserts that, “men and women in dating relationships will come to several crucial forks in the road and it does matter which one they choose.” Popular culture is rife with similar messages about the importance of the specific decisions that couples make during courtship. The attention to courtship makes intuitive sense, as this stage of premarital relationships is when two crucial tasks of relationship formation generally take place. First, courtship is when partners begin to gather information and develop an understanding of each other. As described by Swann, De La Ronde, and Hixon (1994), courtship relationships “provide a context wherein people may judge one another's suitability as potential mates.” Those who learn about how their partners manage conflict (e.g., Bradbury, Rogge, & Lawrence, 2001), and discover their specific strengths and flaws (e.g., Murray & Holmes, 1993) prior to marriage should be less likely to make unexpected or unpleasant discoveries about the spouse after the wedding day. From this perspective, any aspects of courtship that offer partners more opportunities to gather accurate information about their partner should enhance the couple's likelihood of success in their subsequent marriage.

Courtship also provides couples with the opportunity to develop overlapping social networks. Perceptions of support and approval from one's social network are important predictors of subsequent marital quality (e.g., Parks, Stan, & Eggert, 1983). Moreover, greater

social connections across partners (i.e., greater network overlap) have been reported to improve partners' sense of interdependence and increase the costs of ending a marriage (Ackerman, 1963; Bryant & Conger, 1999; Kearns & Leonard, 2004; Milardo, 1986; Sprecher & Felmlee, 2000). Any aspects of courtship that facilitate more and deeper connections between spouses' social networks prior to marriage may be associated with more stable and more satisfying relationships after marriage as well.

To the extent that the decisions partners make along the path to marriage facilitate or interfere with these tasks, those decisions are likely to be associated with subsequent marital outcomes as well. In the remainder of this section, we review theory and research relevant to understanding how four specific courtship decisions may come to be associated with more or less successful marriages.

Where To Look For A Potential Partner. In 1992, the National Health and Social Life Survey suggested that more than half of married couples met through family or friends, 38% met through school or work, and only 8% met at a bar (Laumann, Gagnon, Michael, & Michaels, 1994). In a more recent study of over 3000 Americans (Madden & Lenhard, 2006), among the two-thirds that were married 38% had met their spouse in "real-world" settings, such as work or school, 34% through family or friends, 13% at a social gathering, such as a nightclub, bar or café, and 3% reported meeting through the Internet. More recent studies have argued that an increasing number of adults are meeting their partners online through Internet dating sites (Cacioppo, Cacioppo, Gonzaga, Ogburn, & VanderWeele, 2013; Finkel, Eastwick, Karney, Reis, & Sprecher, 2012; Rosenfeld & Thomas, 2012). However, survey data reveals that despite increasing rates of dating through online venues, more than 90% of marriages still take place between spouses who first met offline (Paul, 2014).

To the extent that different contexts promote meeting more or less suitable potential mates, where people go to meet their potential spouse may have downstream consequences for the relationship. For example, couples meeting through shared environments like school, work, or church are likely to be more similar to each other and to share more social network ties in common at the outset of their relationship. Couples who meet through a mutual social network member are likely to benefit from the explicit approval and support of the network member(s) who set them up (Sprecher & Feilmeier, 1992). In contrast, couples who meet by chance, or in more anonymous settings, such as a bar or online, are less likely to share preexisting social connections. Without access to shared supportive social network members, partners who meet by chance or online may have trouble developing trust and integrating their disparate social circles, which may lead partners to perceive less support for their relationship (Sassler & Miller, 2014). Thus, partners who meet without the advantage of a shared social network may have difficulty maintaining satisfying long-term romantic relationships.

We are aware of only two studies that have examined whether the way spouses meet is associated with their marital outcomes; both compare couples who met online to couples who met offline. The first study, a cross-sectional survey of Internet users sponsored by eHarmony, reported that individuals who met their partners online were happier in their marriages and were less likely to have separated than those who met offline (Cacioppo et al., 2013). A nationally representative longitudinal survey, in contrast, found that both marital and non-marital relationships that began online were significantly more likely to dissolve than relationships that began offline (Paul, 2014). We are aware of no research that has examined differences in rates of marital dissolution or relationship quality across different offline contexts, i.e., the contexts in which most couples who go on to marry actually meet.

Length of Courtship. Some couples have already been together for years on the day they get married, whereas others take the plunge soon after their first meeting. The time that couples spend in various stages of courtship may facilitate or limit their ability to establish a foundation for their subsequent marriage. A relationship that progresses to marriage after only a few weeks may not offer partners the same degree of insight into each other as a relationship between partners who spend several months, or even years, getting to know one another before deciding to marry. Moreover, a quick courtship may not allow each partner's close friends and family members the opportunity to meet their future spouse before marriage, which may result in these couples feeling unsupported and disconnected from their social networks at the start of their marriage. From this perspective, longer courtship ought to predict stronger marital relationships. On the other hand, some argue that an excessively long courtship may reflect one or both partners' uncertainty or ambivalence toward their relationship. For example, Huston (1994) suggested that couples who spend a lot of time in any particular stage of courtship may not feel ready for greater commitment, may feel less certain about their love for each other, or may be experiencing greater conflict during those times. This perspective implies a negative association between courtship length and subsequent marital outcomes, with the longest courtship periods associated with less successful marriages.

The results of research examining these perspectives have been inconsistent. One cross-sectional survey of long-married individuals documented positive linear associations between total courtship length and marital satisfaction (Grover, Russell, Schumm, & Paff-Bergen, 1985). In contrast, Teichner and Farnden-Lyster (1997) reported that married couples with longer total relationship lengths (i.e., courtship duration plus marriage duration) had lower marital satisfaction. Longitudinal studies have been inconsistent as well. One found that the longer that

couples knew each other before marriage the more likely they were to remain intact after one year (Kurdek, 1991) and five years (Kurdek, 1993). Others find that the length of time partners knew each other and the length of time partners dated fails to predict whether couples end up divorced, distressed, or happily married after 13 years (Clements, Stanley, & Markman, 2004) and that longer courtships fail to predict marital satisfaction (Huston, 1994) or expressions of affection two years into the marriage (Niehuis et al., 2014). To reconcile these contradictory findings, Huston (1994) proposed that the association between relationship length and marital outcomes might be curvilinear. However, we are aware of no published studies that have addressed this possibility directly.

Prior Friendship. Friedrich Nietzsche (1878/1994) said, “The best friend will probably acquire the best wife, because a good marriage is founded on the talent for friendship.” If this is true, couples that were friends before they began their romantic relationship should be more capable of creating and maintaining a satisfying marriage than couples that began a romantic relationship without any previous relationship. To the extent that a period of friendship adds to the time that couples are likely to have known each other before marriage, couples that were friends before they began dating should have had more time to learn about one another, and presumably to break up if they discovered intolerable qualities in each other. Those that elected to marry after accumulating that knowledge may have more stable marriages, compared to couples that did not start as friends. Moreover, couples who meet as friends are likely to share other social connections, and may therefore be more likely to share network members supportive of the relationship.

Despite widespread acceptance of the wisdom of marrying your best friend, we are aware of only one study that has come close to putting this assumption to the test. In a cross-sectional

study of 137 long-married couples in Holland, couples who reported having been friends before their romantic relationship began were no more or less satisfied in their marriage than couples who had not been friends before they began dating (Barelds & Barelds-Dijkstra, 2007). This is a suggestive result, but the reliance on a sample of long-married couples excludes the more vulnerable couples that may have already left the population through divorce or separation, preventing strong conclusions.

Prior Cohabitation. Over the past several decades, rates of premarital cohabitation have greatly increased. Whereas in the 1970s only about ten percent of couples cohabited prior to marriage (Bumpass & Lu, 2000), today most couples report doing so (Kennedy & Bumpass, 2008), with some estimating that as many as two-thirds of couples now cohabit before marriage (Manning & Stykes, 2015).

Cohabitation provides partners with the opportunity to learn the intimate details of the others' routines and behaviors. For incompatible partners, this experience may teach them about (otherwise concealed) deal-breaking habits and provide sufficient justification for ending the relationship before escalating to marriage. For well-matched partners, cohabitation may instead provide experiences that build effective conflict management strategies, which could strengthen their relationship and buffer them from crises down the road. Thus, conventional wisdom suggests that living together may act as a screening process, such that only the most compatible cohabiters will go on to marry each other, leading to more stable marriages among this group (i.e., Teachman, Thomas, & Paasch, 1991).

Early researchers disputed this conventional wisdom, stating that cohabitation was non-normative, characterized by ambiguous roles and expectations that could lead partners to engage in greater conflict (Nock, 1995). Moreover, there was evidence of selection effects into

premarital cohabitation, such that the couples deciding to cohabit before marriage might have more liberal views, and therefore greater acceptance of divorce as a viable outcome, even in a relationship of equal quality to that of a non-cohabiter (Axinn & Thornton, 1992; N. G. Bennett, Blanc, & Bloom, 1988). It has even been argued that, rather than acting as an effective screening process for marriage, cohabitation may instead propel sometimes incompatible partners into marriage through the momentum of ever-increasing commitment (Stanley, Rhoades, & Markman, 2006).

With respect to predicting divorce, these issues have been studied for decades. Prior research has documented that even after adjusting for religiosity, length of cohabitation, age at marriage, premarital pregnancy, education, and a host of other sociocultural variables that might account for selection into cohabitation, premarital cohabitation has been persistently associated with greater likelihood of divorce (e.g., N. G. Bennett et al., 1988; DeMaris & Rao, 1992; Teachman & Polonko, 1990; Thomson & Colella, 1991). Some recent research has called these findings into question, reporting null associations, or at least weaker associations, between premarital cohabitation and marital stability (Lillard, Brien, & Waite, 1995; Manning & Cohen, 2012; Reinhold, 2010). A recent meta-analysis of this literature concluded that premarital cohabitation was only associated with greater likelihood of divorce for some people, whereas those in their first marriage, or those whose cohabitation was only with the eventual marital partner, were not more likely to divorce (Jose, O'Leary, & Moyer, 2010).

Less commonly studied has been the association between premarital cohabitation and marital satisfaction, as this requires psychological assessments of couples' sentiment toward their relationship rather than population-level information about cohabitation and divorce rates. If cohabitation is associated with more liberal attitudes about the acceptability of divorce, it does

not necessarily follow that the quality of the relationship would differ between cohabiters and non-cohabiters. The results of research examining cohabitation effects on marital quality, like research on marital stability, have been inconsistent. Some cross-sectional research has reported small but significant negative associations between premarital cohabitation and marital satisfaction (Jose et al., 2010). Others have only found this association among women but not among men (Brown, Manning, & Payne, 2015). The only longitudinal research on this topic measured marital satisfaction biannually for a cohort of wives at various marital lengths, and documented no differences in marital quality between cohabiters and non-cohabiters initially or over time (Tach & Halpern-Meeekin, 2009). To resolve these issues, marital quality data is needed on both spouses over time from a sample of newlywed couples that will include the population of couples who dissolve their relationships early. We are aware of no studies that have done this yet, so the goal of the present investigation is to fill this gap in the literature.

Overview of the Current Studies

Given the widespread belief that characteristics of premarital courtship have serious implications for later marital outcomes, and given the limited and inconsistent research on these implications, the goal of the current investigation was to examine directly whether specific choices that partners make on the path to marriage predict their marital outcomes. Toward this goal, we drew upon data from four independent longitudinal studies of newlywed couples that were assessed every six months for first four years of their marriage (eight assessments). All four studies employed similar strategies for recruiting married couples and nearly identical procedures and assessments. Specifically, couples in all studies were invited to describe their courtship, with specific prompts to determine where couples met, the total length of their courtship, whether they were friends before they began a romantic relationship, and whether they

lived together before marriage. At baseline and every subsequent semi-annual assessment, spouses were asked to report on their marital status and to complete measures of marital satisfaction.

Newlyweds are an appropriate sample in which to address these issues for two reasons. First, newlyweds are not far removed from their courtship, so their memories are likely to be more accurate than those of more established couples. Second, focusing on couples who have just been married ensures that the samples have not been biased by the selective departure of the most vulnerable couples from the population (Karney & Bradbury, 1995).

After describing the mean characteristics of couples' courtships and the associations between courtship decisions and spouses' individual differences, the analyses described below examine how each of the four courtship choices identified in prior research is independently associated with marital dissolution and trajectories of marital satisfaction over the first years of marriage. These trajectory analyses treat each courtship experience as a predictor of how satisfied couples are at the beginning of their marriage (marital satisfaction intercepts) as well as linear changes in marital satisfaction over time (marital satisfaction slopes). In light of the inconsistent findings of prior studies of these issues, the ability to evaluate whether any significant findings replicate across independent samples or are spurious seems an appropriate way of addressing the concerns about replicability that have recently swept across the social and biomedical sciences (e.g., Pashler & Wagenmakers, 2012).

METHOD

Sampling and Participants

Participants were 966 first-married heterosexual newlyweds (N=483 couples) from four independent longitudinal studies of relationship development during the first four years of

marriage. These studies have been examined separately and in combination in prior research (e.g., Lavner, Karney, & Bradbury, 2015), and none have yet to examine premarital history as a predictor of marital outcomes. Two of the studies were conducted in the Los Angeles area in 1991 (N=60 couples, “Sample 1”) and 1993 (N=172 couples, “Sample 2”); the other two studies were conducted in a central Florida community surrounding a major state university in 1998 (N = 82 couples, “Sample 3”) and 2001 (N=169 couples, “Sample 4”). Couples in all four studies were recruited using advertisements in community bridal shops and newspapers, or through direct invitations sent to couples that had recently completed a marriage license application in the county at the time of the study.

Participants across all four studies were screened in a telephone interview to determine whether they met the following criteria: (a) first marriage for each partner, (b) married less than six months, (c) did not have children, (d) spoke fluent English, (e) had at least a 10th grade education (to ensure comprehension of all materials), (f) were above 18, and (g) wives were below 35 years of age (to allow for the transition to parenthood for all couples). After determining eligibility, couples provided consent, and were scheduled for an initial laboratory session. Participants across all four studies were of similar age (i.e., spouses were in their mid-20s, with husbands slightly older than wives on average), mostly Caucasian, English speaking, and well-educated (see Table 1).

Procedure

Procedures were nearly identical in all four studies. Couples meeting all eligibility criteria were mailed a battery of questionnaires, which they were asked to complete at home independently before arriving to their scheduled three-hour laboratory session. Upon arriving at the session, spouses independently completed a number of additional demographic

questionnaires and questionnaires assessing their marital satisfaction and marital problems. As part of the lab session, husbands and wives also independently participated in an audio-recorded semi-structured interview. During the interview, partners began by describing their early relationship experiences, such as where they met, and how their relationship progressed from dating to marriage, along with a number of other interview questions beyond the scope of the present investigation. The interviews lasted about one hour on average for husbands and wives across all four of the studies. Husbands and wives also participated in several videotaped communication tasks beyond the scope of the present investigation.

After the initial session, couples were mailed subsequent packets to assess marital status and marital quality every six months over the first four years of their marriage, for a total of up to eight assessments. Spouses also revisited the lab and completed another round of additional questionnaires and recorded interviews beyond the scope of the present study six months after the initial assessment (Time 2) in Sample 2, and two years after the initial assessment (Time 5) in Samples 3 and 4. Couples were paid at each stage of their participation. Depending on the sample, participants were paid \$50–\$75 initially and \$25–\$50 at each follow-up.

Measures

Courtship Measures. In their self-report questionnaires and during their in-person interviews, husbands and wives were separately asked to describe their pre-marital experiences with their partner. Whenever available, responses from the self-report measure were used in the present analyses, but in cases when data was missing for specific individuals, or when an item was not asked on the questionnaire in a particular study, we attempted to fill in missing data using responses provided during the interview. During the interview, husbands and wives were

separately asked to describe their early marital experiences with a non-specific probe, such as, “*I would like you to take a few moments and tell me the history of your relationship with [spouse’s name] up until now. It needn’t be too elaborate, but I’d like you to talk about: how you started dating and what the early stage of your relationship was like...*” The exact phrasing in the prompt varied slightly across the four samples, but the goal was similar across them all. This general prompt was then followed by a series of more specific probes. Those relating to the present investigation are each described in greater detail in the following sections. For variables exclusively derived from the interviews, a team of research assistants coded spouses’ interviews into quantifiable responses comparable to those from the self-report measures (i.e., interview responses describing the history of their relationship’s progression in years were recoded into months). One third of these interviews were randomly selected to be double-coded by two raters. Intraclass correlation coefficients (ICCs) indicated that the reliability of coders’ ratings was adequate (across studies, the ICCs ranged from .77 to .98 for where the couples met, from .91 to .99 for the four courtship length variables, from .73 to .92 for whether partners were friends before dating, and from .92 to .96 for cohabitation prior to marriage). Disagreements between raters were resolved by random selection.

Where the Couple Met. In the audio-recorded interviews in all four studies, spouses were asked to describe how they had met their partner. Their responses included (occasionally lengthy) stories about the series of events that led to the partners meeting each other. To develop coding categories for responses to this question, we used standard procedures for coding open-ended survey questions (Ryan & Bernard, 2003). The goal of this procedure was to develop a comprehensive set of categories that would accurately describe responses without being overly general or overly specific in scope. In the first step of this process, a sample of the responses was

given to five trained coders. Each coder read through the sample responses and independently developed a set of categories to capture the content of the responses to the question. The five coders then met with the researchers and discussed the categories that they had generated. This discussion yielded a set of six categories that were agreed upon by all coders. Couples all met through either 1) a shared work environment, 2) a shared educational environment (e.g., high school or college), 3) a shared religious environment (e.g., church, or church-related activity), 4) a shared social network member (e.g., friend, neighbor, or relative), 5) a real-world chance encounter (e.g., a bar, grocery store, or gym), or 6) an online or real-world dating service. In the next step, coders were assigned to code each response independently with an appropriate code. In about ten percent of cases, the stories identified more than one method that was at play for the partners' introduction. For example, a couple may have met through a shared contact in a university dorm. Using details from the story, coders were asked to select the one category that best described the primary context of the couple's meeting. Any uncertainties about the codes were discussed collaboratively with the researchers in an iterative process, with coders sorting and categorizing all responses for one spouse before moving on to another. ICCs of coders' ratings of where couples met were .86, .94, .77 and .98 across Studies 1-4 respectively.

After all responses were coded into the six categories, the six categories were then collapsed into three categories based on the a priori hypotheses of the current studies: 1) those who met each other by regularly sharing the same environment at work, school or church; 2) those who met through a social network member (friend, family or otherwise), and 3) those who had no overlapping social network or physical environment (i.e., those who met by chance or those who used a dating service).

Courtship Length. The present studies examine four courtship length variables; 1) how long spouses knew each other before their marriage in total, 2) how long between meeting and beginning their dating relationship, 3) how long the couple dated before their engagement, and 4) how long they were engaged.

In Samples 1 and 2, spouses were not asked about their relationship's progression in the self-report questionnaires. Instead, spouses were each asked in their interviews: 1) "*How long have you known [spouse's name]?*" 2) "*How long had you known one another before you began dating?*" 3) "*How long after [you started dating] did you decide to get married or actually get engaged?*" and 4) "*How long after that did you actually marry?*" Interviewers were trained to elicit rough dates from their interviewee, and worked with them to obtain an accurate response (recorded to the month) at the time of the interview.

In Samples 3 and 4, spouses were asked in their self-report questionnaires to report the date they originally met their spouse, the date they became engaged, as well as the date of their marriage. From these responses, the total length of time spouses knew each other (1) was calculated as the difference between the date of their first meeting and their marriage date in months. The length of engagement (4) was calculated as the difference between the date of their engagement and their marriage date in months. Spouses did not report the specific date they began dating their partner, but were asked "*How long had you and your spouse known each other before deciding to become romantically involved?*" Spouse's response to this question was used as a measure of the length of time partners knew each other prior to dating (2). To calculate the length of time partners dated before their engagement (3), the length of time partners knew each other before dating and the length of their engagement were subtracted from the total length

of time partners knew each other to derive an estimate of the remaining time partners were together.

Prior Friendship. A goal of the present studies was to identify whether spouses were friends prior to beginning their dating relationship. In Samples 1 and 2, spouses were never asked this explicitly, but coders were able to derive prior friendship from the interview responses to the probes: “*What were your initial feelings toward [spouse’s name]?*” and “*At what point did you feel that your relationship was more than just another friendship?*” In some cases, determining prior friendship was clear from other aspects of the interview, such as their story about where they had met. Coders’ ratings were reliable both in Sample 1 (ICC= .73) and Sample 2 (ICC= .82). In Samples 3 and 4, spouses were asked in their self-report questionnaires: “*Were you and your spouse friends before becoming romantically involved?*” Responses to this item were dummy coded with a 1 to indicate the partners had been friends prior to beginning their dating relationship, or a 0 to indicate no prior friendship.

Prior Cohabitation. Finally, all four studies asked whether spouses had lived together prior to becoming married. This question was asked in Samples 1 and 2 during the interview only (ICCs = .96 and .92, respectively), and in Samples 3 and 4 in both the self-report questionnaires and interview. Responses were dummy coded with a 1 to indicate the partners had cohabited prior to marriage, or a 0 to indicate no prior cohabitation. If partner’s moved in together only within a few months of the wedding in preparation for their marriage, this was coded as a 0.

Relationship Outcome Measures. At every follow up assessment across the four studies, husbands and wives were asked whether they were still married to their spouse. Those who were still together were then also asked to describe how satisfied they were in their

marriage. Those who indicated that their marriage had dissolved were not contacted again at subsequent waves of assessment.

Marital Dissolution. Participants' responses to whether they were still with their spouse were categorized as "married," "temporarily separated or not living together," "trial separation," "legally separated," or "divorced/permanently separated." Responses of "legally separated" and "divorced/permanently separated" were considered dissolved relationships, with dissolution coded as 1 and intact coded as 0.

Marital Satisfaction. Most commonly used measures of marital satisfaction ask spouses to report their global sentiments toward the marriage as well as their level of agreement about specific problem areas (e.g., the Marital Adjustment Test; Locke & Wallace, 1959). As several authors have pointed out (e.g., Fincham & Bradbury, 1987), the use of such omnibus measures can lead to inflated associations with other variables that also address relationship processes. Thus, all four studies included two different measures of marital satisfaction that tap global sentiments exclusively, the Semantic Differential (SMD; Osgood, Suci, & Tannenbaum, 1957) and the Quality of Marriage Index (QMI; Norton, 1983). The SMD asked spouses to rate their current feelings about their marriage on 7-point scales between 15 pairs of opposing adjectives (e.g., "Bad-Good," "Dissatisfied-Satisfied," "Unpleasant-Pleasant"), yielding total scores with a potential range from 15 to 105. To ensure that any results were not specific to a particular instrument for measuring satisfaction, we also measured spouses' marital satisfaction with the QMI, a six-item scale asking spouses to report the extent to which they agree or disagree with general statements about their marriage (e.g., "We have a good marriage" and "My relationship with my partner makes me happy"). Five items ask spouses to respond according to a 7-point scale, whereas one item asks spouses to respond according to a 10-point scale, yielding scores

from 6 to 45. Higher scores across both measures reflect greater satisfaction with the relationship. Each of these measures was assessed every 6 months over the 4 years of each study, for a total of 8 assessments in each of the four studies. The internal consistency of both scales was high across all eight waves (Cronbach's alpha was higher than .90 for both spouses across all waves of assessment in all four studies).

Antecedents of Courtship. To examine whether the odds of experiencing courtship in any particular way were predicted by pre-existing individual factors that might need to be controlled for in the primary analyses of this investigation, we examined spouses' demographic characteristics, self-esteem, and personality. Each are described in turn below.

Demographic Information. Demographic data were collected at the baseline interview. Each participant's date of birth, years of education completed, the number of prior relationships and parental divorce were all collected at this time. Age at the baseline interview was calculated from the self-reported birth date in all four studies. Years of education was calculated as the sum of three items: years of high school completed (where all years of primary and middle school education were added for participants completing any high school or more), years of college completed, and years of school completed after college (each ranging from 0-5) in all four studies. Prior relationship history was only assessed in Samples 1, 3, and 4, with the following question, "*Before your current relationship, how many serious relationships would you say you had?*" Response options included, 0, 1, 2, 3, 4 or 5+. Parental history of divorce was also only assessed in Samples 1, 3 and 4, with the following question, "*Did your parents ever divorce or separate permanently?*" Responses to this item were dummy coded with a 1 to indicate the parents had divorced or separated, or a 0 if not.

Self-esteem. Spouses in all four studies were asked to complete the Rosenberg (1965) Self-Esteem Scale, which is a 10-item measure, in which participants are asked to indicate the extent to which they agree with a number of statements about their own self-esteem (e.g., “I feel that I am a person of worth, at least on an equal plane with others” or “I feel I do not have much to be proud of” (reverse scored) on a scale from 1 = *strongly disagree* to 4 = *strongly agree*). Higher scores on the scale indicate greater levels of self-esteem. In the present samples, internal consistency reliabilities ranged from .87 to .88 across studies for husbands, and from .83 to .89 across studies for wives.

Personality. Personality was measured in two ways. In Samples 2, 3 and 4, spouses were asked to complete a Big 5 personality inventory. In Sample 2, husbands and wives completed the shortened version 60-item NEO – Five Factor Inventory (NEO-FFI; Costa & McCrae, 1992), which assesses the Big Five personality traits: Extraversion, Agreeableness, Neuroticism, Conscientiousness, and Openness to Experience with demonstrated high internal consistency (.79, .75, .79, .83, and .80 respectively; Costa & McCrae, 1992). In Sample 2, internal consistency reliabilities for husbands and wives, respectively, were .77 and .76 for Extraversion, .75 and .80 for Agreeableness, .75 and .78 for Neuroticism, .84 and .77 for Conscientiousness, and .74 and .75 for Openness to Experience. In Samples 3 and 4, husbands and wives completed the 50-item IPIP representation of the Goldberg (1992) markers for the Big Five factor structure. Each of these five factors also have demonstrated high internal consistency (.87, .82, .86, .79, and .84; Goldberg, 1992). In the present samples, internal consistency reliabilities for husbands in Samples 3 and 4 respectively were .90 and .91 for Extraversion, .84 and .84 for Agreeableness, .90 and .88 for Neuroticism, .82 and .84 for Conscientiousness, and .83 and .79 for Openness. The internal consistency reliabilities for wives in Samples 3 and 4 respectively

were .88 and .88 for Extraversion, .81 and .76 for Agreeableness, .89 and .88 for Neuroticism, .88 and .85 for Conscientiousness, and .85 and .81 for Openness.

Across all four studies, a sub-facet of personality, neuroticism, was also assessed using the Neuroticism scale of the Eysenck Personality Questionnaire (EPQN; Eysenck & Eysenck, 1978). This is a 23-item measure asking spouses to answer yes or no questions about their negative affectivity (e.g., “Are you a worrier?” “Does your mood go up and down often?”). Yielding scores ranging from 0 to 23, the EPQN has demonstrated high internal consistency (.84; Eysenck & Eysenck, 1978). In Sample 1, data were recorded at the time of interview as a sum score across all items, which does not allow us to assess internal reliability. However in Samples 2, 3 and 4, internal consistency reliabilities were adequate ranging across studies from .82 to .88 for husbands, and from .83 to .85 for wives.

A Note About The Analyses

We sought to design a research protocol and set of analytic procedures that would represent the best practices for scientific research. As stated by Lykken (1968) long before the present replication crisis in the social and behavioral sciences, “Ideally, all experiments would be replicated before publication but this goal would be impractical” (p. 159). Fortunately, this was an achievable goal for the present investigation. Throughout the results section, we will be conducting separate but parallel analyses across each of the four independent samples. In order to avoid drawing conclusions from potentially spurious results, we will only discuss the effects that are statistically significant in the same direction in most samples (i.e., three of the four). It is worth noting that there were no patterns of effects statistically significant in the same direction in only two of the four studies, though several sporadic results were significant in only one.

RESULTS

Do Spouses Agree About the Details of Their Courtship?

Across the four studies, spouses were independently asked about their courtship experiences. To evaluate the reliability of partners' responses, we estimated the agreement between spouses on each question (see Table 2).

As we reported earlier, our coding team reliably agreed about how partners met. Similarly, results of these analyses indicate that stories also lined up well between spouses. Spouse agreement was calculated as a raw percent agreement score ranging from 75% to 85% across the four studies. Most disagreements that arose were derived from stories in which one partner described having met their spouse at work, school or church, but the other described having met through a social network member at work, school or church.

With respect to the length of the partners' courtship, intraclass correlation coefficients comparing responses between spouses within a couple were relatively high across all four premarital timing variables with few exceptions. ICCs across the four studies ranged from .86 to .98 for the total length of time spouses knew each other before their marriage (1); from .75 to .97 for the length of time between meeting and beginning their dating relationship (2); from .67 to .95 for the time the couple dated before their engagement (3); and from .53 to .91 for the length of their engagement (4). A closer look at the variables with lower ICCs in a particular study indicated that most disagreements came from a limited number of cases in which spouses disagreed about the specific date of their engagement. Removing these one to four cases per study increased all ICCs to higher than .80 across the four courtship length items across all four

studies, however to make use of the available data all cases were retained. The pattern of results for any further analyses did not change when including or excluding these cases.

For the categorical courtship variables, spouse agreement was calculated as a raw percent agreement score. Agreement on whether spouses were friends prior to dating was also calculated as a raw percent agreement score, which ranged from 69% to 85% across the four studies. Finally, percent agreement on cohabitation ranged from 92% to 100% across the four studies.

In sum, when each spouse was asked to report independently on the details of their premarital relationship, their answers generally converged, justifying further analyses of these variables.

What Are the Most Common Courtship Experiences?

As illustrated in Figure 1, 49-60% of couples met at work (9-20%), school (20-42%), or church (3-12%) across the four studies. An additional 26-35% of couples met by being introduced through a social network member. The least common way of meeting was through a chance encounter (i.e., a bar, grocery store, or gym) or through a dating service; only 7-15% of couples met in this way across studies.

Across all four studies, couples on average reported knowing each other between 9 and 16 months prior to beginning their dating relationship. Excluding those who began dating right away, those with non-zero scores knew their partner an average of 12 to 19 months across studies, with the longest reported time being over 12 years. Couples then dated an average of 20 to 31 months, and were engaged for an additional 10 to 13 months on average across studies, for a total average courtship period of about 4 years (see Figure 2). In sum, in this sample of couples

who went on to marry, the average couple knew each other for about a year before dating, dated for about two years, and then was engaged for about a year before getting married.

Across studies, about one-half of couples reported being friends before they began dating (Figure 3) and one-half of couples also reported living together before they were married (Figure 4).

Do Different Aspects of Courtship Covary With Each Other?

In addition to examining the frequencies of each of these four courtship experiences independently (as described in the previous section), we also examined whether there were any systematic associations *among* the courtship experiences. For example, is the length of each stage of courtship associated with where couples met, whether or not they were friends before they began dating, or whether or not they lived together before they were married? To address these questions we conducted a series of analyses examining the association between each combination of the courtship variables of interest. With the four courtship length variables, where couples met, prior friendship and premarital cohabitation, there were a total of 21 combinations. When considered across all four studies, for both husbands and wives, this yielded a total of 168 analyses. Without any Bonferroni correction, 65 of the 168 tests were significant at a $p < .05$ significance level. Five patterns of association emerged across both husbands and wives and in at least three of the four studies. Not surprisingly, partners with longer total courtships (1) knew each other longer before dating (2) dated for a longer period of time (3) and were engaged for a longer period of time (4). Those who were friends prior to dating also reported knowing each other longer before dating (2). Finally, those who were friends prior to dating also were more likely to have met each other through a shared work, school or church environment than

through a social network member, chance encounter or dating service. When we employed a Bonferroni correction for the large number of tests, 27 effects and only one pattern remained significant across at least three of the four studies for both husbands and wives at a $p < .001$ significance level. Partners with longer total courtships (1) dated for a longer period of time (3). Otherwise, different aspects of couples' premarital experiences tended to be independent of each other. For example, husbands and wives who reported meeting through a social network, were no more or less likely to cohabit than those who met at work, school, church, in a chance encounter, or dating service.

Predicting the Course of Couples' Courtship?

To determine if there were any aspects of personality or personal history that might allow us to predict where partners meet and marry their spouses, we conducted a series of analyses predicting the courtship experiences from a number of individual factors. Specifically, we examined age, education, parental history of divorce, the number of serious prior relationships a person had before their spouse, self-esteem, the Big 5 personality traits (Extraversion, Agreeableness, Neuroticism, Conscientiousness, and Openness) as well as a second measure of Neuroticism (the EPQN), as potential predictors of the decisions couples make in courtship.

To examine associations between where couples met each other with these potential predictor variables, we developed three dummy codes to test significant differences between those who met via work, school or church versus the other two categories (Table 3); between those who met through a social network member versus the other two categories (Table 4); and between those who met in a chance encounter or through a dating service versus the other two categories (Table 5). Without any Bonferroni correction, 18 of the 222 tests were significant at a

$p < .05$ significance level. However, none of the effects were replicated in at least three of the four studies across husbands or wives. With a Bonferroni correction, none of these effects remained statistically significant.

With respect to relationship timing, correlations for the how long partners knew each other before marriage in total (1), how long partners knew each other prior to dating (2), how long partners dated before getting engaged (3), and how long partners were engaged (4) are presented in Tables 6-9. Without any Bonferroni correction, 31 of the 296 tests were significant at a $p < .05$ significance level. One reliable pattern emerged for one of the four relationship timing variables. Husbands who listed more prior serious relationships reported shorter total lengths of time knowing their spouse (r s range from $-.24$ to $-.29$, p s $< .05$ in Samples 1 and 3, and $p < .01$ in Sample 4). The number of prior relationships was not measured in Sample 2, so although it does not replicate in all four studies, it does replicate in all available studies for husbands. This effect did not replicate for wives, nor was this effect replicated for any other periods of the courtship. With a Bonferroni correction, none of these effects remained statistically significant.

Correlations for whether partners were friends prior to dating and these potential predictor variables are presented in Table 10. Without a Bonferroni correction, 7 of the 74 tests were significant at a $p < .05$ significance level. All of these effects were sporadic, so no significant patterns of effects replicated in at least three of the four studies for husbands or wives. With a Bonferroni correction, none of these effects remained statistically significant.

Finally, correlations for whether partners cohabited prior to marriage and the potential predictor variables are presented in Table 11. Without a Bonferroni correction, 12 of the 74 tests

were significant at a $p < .05$ significance level. Again all of these effects were sporadic, so no significant patterns of effects replicated in at least three of the four studies for husbands or wives. With a Bonferroni correction, 2 of the 74 sporadic effects remained statistically significant, but again not systematically.

In sum, across all four of the studies, personal history, self-esteem, and aspects of personality could not reliably and significantly predict the way partners met and married their spouse. In light of these findings, we do not make any adjustments for these variables in further analyses on marital outcomes.

Do Pre-Marital Courtship Experiences Predict Long-term Marital Outcomes?

The primary goal of this research was to examine whether the choices partners make during courtship place them on a trajectory to a more or less successful marriage. To examine this question, participants' coded responses were used as predictors of relationship dissolution and marital satisfaction trajectories over the first four years of marriage.

Marital Dissolution. Across the four samples, 8% - 32% of couples dissolved their relationship by the end of the four-year study. These rates are comparable to average national rates of marital disruption of 12-20% within the first 3-5 years of marriage (Bramlett & Mosher, 2002). In Sample 1, 19 couples (32%) dissolved their relationship, 38 couples (63%) confirmed they were still together, and the remaining 3 couples (5%) were lost to follow up. In Sample 2, 13 couples (8%) dissolved their relationship, 124 couples (72%) confirmed they were still together, and the remaining 35 couples (20%) were lost to follow up. In Sample 3, 17 couples (21%) dissolved their relationship, whereas the remaining 65 couples (79%) all confirmed they

were still together. In Sample 4, 22 couples (13%) dissolved their relationship, whereas the remaining 147 couples (87%) all confirmed they were still together.

To examine the association between the categorical measures of couples' courtship experiences (i.e., where couples met, prior friendship and prior cohabitation) we evaluated each courtship predictor independently in a series of Chi-Square tests. Where couples met, whether spouses were friends before dating, and whether partners cohabited prior to marriage were not significantly associated with subsequent marital dissolution for husbands or wives across all four studies (Table 12).

To examine the association between each of the continuous measures of couples' courtship experiences (i.e., the length of relationship transitions) on marital dissolution, we evaluated each courtship length variable independently in a series of logistic regressions. None of the four courtship length variables predicted marital dissolution for husbands or wives across all four studies (Table 12). To allow for the possibility that time may have had a curvilinear association with divorce (such that too little or too much time in a particular stage of courtship was associated with worse outcomes, but some middle amount was ideal), we also examined quadratic effects of time on marital dissolution. Results of these tests indicated no significant quadratic associations for any of the four courtship length variables across all four studies for either husbands or wives ($ps > .16$).

Marital Satisfaction. When considering the success or failure of a marriage, remaining intact and remaining satisfied (initially and over time) are distinct phenomena (i.e., Karney & Bradbury, 1995). Thus, another goal of this research was to examine how courtship decisions predicted subsequent marital satisfaction trajectories over the first four years of marriage.

In these analyses, participants' responses were used as predictors of marital satisfaction trajectories in a series of multi-level models with repeated observations of marital satisfaction nested within partners over time. These models were estimated using the MIXED procedure of SAS 9.3 (SASInstitute, 2001) in order to estimate equations at all levels of nesting simultaneously (up to eight repeated observations nested within individuals, and individuals nested within couples) and to estimate associations with each growth curve parameter controlling for effects on all other parameters. Growth curve modeling provides maximally efficient estimates of trajectories by weighting parameter estimates with the cases comprised of complete data, i.e. those that can be estimated precisely. When the trajectory of an individual cannot be estimated precisely, the final estimate relies more heavily on the mean of the sample. Because the most precise estimates therefore contribute more to the final estimated variance of the sample, variances are more conservative than those obtained through traditional optimal least squares (OLS) approaches.

To account for statistical interdependence within couples, we followed procedures described by Laurenceau and Bolger (2005), which are based on recommendations by Raudenbush, Brennan, and Barnett (1995). In particular, husbands' and wives' parameters were estimated separately but simultaneously using a multivariate technique in which dummy variables were used to nest husband and wife data within each couple. Each model included husbands' and wives' reports of each courtship variable (one at a time) as time-invariant predictors. Time was included (centered at the first assessment) using the following equations.

Level 1:

$$Y_{ti} (\text{Marital Satisfaction}) = \pi_{w0i} + \pi_{w1i} (\text{Time})_{ti} + \pi_{h0i} + \pi_{h1i} (\text{Time}) + e_{tij}$$

Level 2:

$$\begin{aligned} \pi_{w0i} \text{ (Wife Intercept)} &= b_{w00} + b_{w01}(\text{Courtship Experience}) + m_{w0i} \\ \pi_{w1i} \text{ (Wife Slope)}_{ti} &= b_{w10} + b_{w11}(\text{Courtship Experience}) + m_{w1i} \\ \pi_{h0i} \text{ (Husband Intercept)} &= b_{h00} + b_{h01}(\text{Courtship Experience}) + m_{h0i} \\ \pi_{h1i} \text{ (Husband Slope)} &= b_{h10} + b_{h11}(\text{Courtship Experience}) + m_{h1i} \end{aligned}$$

where Y_{ti} is the marital satisfaction of partner i at Time t ; π_{w0i} is the marital satisfaction of the wife at Time 1 (i.e., the wife's initial marital satisfaction), π_{w1i} is the rate of linear change in marital satisfaction for the wife, similarly π_{h0i} is the marital satisfaction of the husband at Time 1 (i.e., the husband's initial marital satisfaction), π_{h1i} is the rate of linear change in marital satisfaction for the husband. In this model, variance components were estimated as e_{tij} , or the residual variance in repeated measurements and m_{w0i} , m_{w1i} , m_{h0i} , and m_{h1i} as the level 2 partner-specific variance components for intercepts and slopes. In this way, the analyses adjusted for the autocorrelation from repeated assessments and the shared variance between husbands' and wives' data. In each analysis, the primary variable of interest was examined using only within-partner associations between each courtship experiences and their own intercept and slope (b_{w01} , b_{w11} , b_{h01} , b_{h11}). Moreover, each predictor was evaluated twice per study using each of the two measures of marital satisfaction as outcome measures.

As is the case in most studies of newlywed couples, and as reported across all four of these studies in prior research (e.g., Lavner et al., 2015), husbands and wives reported being quite satisfied in their relationships at the beginning of their marriage. However, as is also true in nearly all longitudinal studies of marital satisfaction (e.g., Kurdek, 1998) and these studies in the past (e.g., Lavner et al., 2015), there was a significant main effect of time for husbands and wives across all four studies on both measures of marital satisfaction (all $ps < .001$). Specifically, across studies, husbands and wives reported declines ranging from -0.55 to -1.33 for each wave

on the SMD, and from -0.31 to -0.72 for each wave on the QMI. These declines were all relatively small leading to an average decline of only 4-9 points over the first four years of marriage for husbands and wives on the SMD, and a decline of only 2-5 points on the QMI across all four studies.

With respect to marital satisfaction intercepts (Table 13), none of the premarital courtship variables predicted how happy husbands or wives would be in the beginning of their marriage in at least three of the four studies on either of the two measures of marital satisfaction. We also conducted a series of tests to allow for the possibility that time may have had a curvilinear association with marital satisfaction intercepts. Results of these tests again indicated no significant quadratic associations for any of the four courtship length variables on marital satisfaction intercepts for either husbands or wives on the SMD or QMI.

With respect to marital satisfaction slopes (Table 14), the results were similar. None of the premarital courtship variables predicted how happy husbands or wives stayed over time in at least three of the four studies on either measure of marital satisfaction. We again conducted a series of tests to allow for the possibility that time had a curvilinear association with marital satisfaction slopes. Results of these tests again indicated this was not the case. There were no significant quadratic associations for any of the four courtship length variables on marital satisfaction slopes for either husbands or wives on the SMD or QMI.

In sum, it appears that the decisions one makes in courtship, such as how long to date their partner, or stay engaged; where to seek out a new partner; whether to date a friend; and whether to move in together before getting married, do not determine how happy spouses will be

or how happy spouses will stay in their marriage, nor whether the relationship will end in the first four years of marriage.

DISCUSSION

Although many believe that premarital courtship has important implications for subsequent marital outcomes, prior research has studied the details of premarital courtship inconsistently, leading to inconsistent results. The goal of the current investigation was to draw upon longitudinal data from four independent samples of newlywed couples to examine whether the specific aspects of couples' courtships predicted their subsequent marital quality and stability across the first four years of marriage.

Descriptive analyses revealed that most people married someone that they met through a shared physical environment or through a shared social network member, a pattern also found in prior work from the 1990s (Laumann et al., 1994), nationally-representative data from the mid-2000s (Madden & Lenhard, 2006), and recent research on Internet-facilitated relationships (Paul, 2014). Descriptive analyses also reveal that on average, couples knew each other for about four years before getting married: one year of pre-dating contact, two years of dating, and a year-long engagement. These rates are similar to those documented as early as the 1940s (Burgess & Wallin, 1944), more recent evidence from newlywed couples (Niehuis et al., 2014), and a recent study conducted by theknot.com of 16,000 brides and grooms (C. Bennett & Perciballi, 2015). The consistency of the findings across time and samples highlights continuity in how couples meet and marry their spouses. Despite recent attention to all of the ways that dating and mate selection have changed in the Internet age, people seem to be meeting their future spouses and proceeding toward marriage in the same ways that they did prior to the Internet. The present studies also documented that about one-half of marriages were preceded by non-romantic

friendships and about one-half of couples cohabited before their marriage, which are consistent with national statistics on premarital cohabitation rates across the 1990s and early 2000s (Bramlett & Mosher, 2002).

Before addressing our central research question, we examined whether premarital courtship experiences were independent from the individual characteristics and personal histories of the individual partners. Specifically, we examined whether individual differences that previous research has shown are significantly and reliably associated with marital stability and quality also predict characteristics of premarital courtship. In these studies, none of the individual differences we measured accounted for how couples progressed to marriage. The idea that individual differences may play a negligible role in the process of selecting a spouse has a precedent in a classic twin study by Lykken and Tellegen (1993). Their study of 738 pairs of monozygotic and dizygotic married twins revealed that, although the monozygotic twins were more similar than the dizygotic twins on a number of their preferences and choices, they were not more similar to each other in the partners they ended up marrying. The failure to find a genetic basis for mate selections lead the authors to describe the process of finding a long-term partner as “adventitious,” i.e., when people are at the right stage of life to select a mate, they may choose partners more or less randomly from within a broad range of suitable and available partners. The present findings are consistent with this idea, suggesting that future research on the way couples progress toward marriage direct attention away from individual characteristics and more toward stage of life and physical environment.

The primary research question for this investigation was to determine whether courtship experiences prior to marriage have downstream consequences for marital outcomes. Despite conventional wisdom that the concrete experiences we have in courtship should have profound

impact on the ultimate success of a relationship in marriage, we found no consistent evidence for any associations between courtship experiences and marital outcomes. It did not matter how we operationalized courtship or how we modeled the analyses (i.e., linear or curvilinear associations). It did not matter which measure of marital satisfaction we examined, whether we looked at effects for husbands or for wives, or whether we evaluated effects on marital quality intercepts, marital quality slopes, or marital dissolution. Although there were a few sporadic significant associations here and there, courtship experiences did not reliably predict marital outcomes across these four independent studies conducted over ten years from two different regions of the country. If there was an effect to find, these studies were highly poised to find it and yet we did not.

Does this mean that nothing of import occurs during premarital courtship? That conclusion seems premature. As discussed earlier, the courtship period provides couples with the opportunities to accomplish two critical tasks of relationship formation. First, courtship is when partners begin to gather information and develop an understanding of each other. The non-significant associations between the shape of couples' courtship experiences and their marital outcomes in the present studies do not suggest that learning about each other is not important. But, it does imply that this learning can be accomplished adequately in many ways. Partners may be able to learn the information they need regardless of whether they were friends first, whether they lived together or not, or whether they took longer to progress through each stage of courtship. Research on first impressions has shown that people can be remarkably accurate in judging someone's skills, personality, or attitudes, within just a few seconds of interacting with them (e.g., Levesque & Kenny, 1993). Likewise, one may only need a little time to make an informed decision about a potential romantic partner, as is the case in speed-dating paradigms

(Finkel, Eastwick, & Matthews, 2007). Therefore, it is quite possible that learning the information necessary to pick an appropriate mate can be done quite efficiently and that courtship parameters that provide additional means to gather information may not be necessary precursors to a successful relationship in marriage.

The second function of relationship formation that courtship serves is the opportunity to develop shared supportive social networks. The process of social network building may not be constrained by the courtship parameters examined here; it may be possible to build an effective shared network regardless of how long partners knew each other before dating or where they met. Indeed, prior research has repeatedly documented increased perceptions of support, approval, and network overlap as relationships naturally progress through increasing levels of commitment over time (e.g., Dailey, Brody, & Knapp, 2015; Hogerbrugge, Komter, & Scheepers, 2013; Kalmijn, 2003; Kalmijn & Bernasco, 2001; Sprecher & Felmlee, 2000). In this way, as long as couples eventually build a network of shared supportive social ties, their relationships may be equally likely to succeed in marriage.

In the present investigation, we focused on four specific elements of the courtship experience that have received attention from prior research and that spouses are likely to recall and report accurately. Yet these four parameters do not exhaust the qualities of premarital courtship. Future researchers may yet identify elements of premarital courtship that do account for subsequent marital outcomes. For example, relationships that develop under contexts of stress, financial hardship, or unemployment in courtship are likely to be more difficult relationships in marriage as well. Prior research has shown that the unique stressors faced by lower-income couples limits their capacity to communicate effectively (Williamson, Karney, & Bradbury, 2013). If the stressful environments these relationships are embedded in remain

constant across both courtship and marriage, these lower-income couples' relationships may be persistently more difficult to maintain. This is an element of the courtship experience that would be likely to predict subsequent marital outcomes. On the brighter side, positive relational qualities of the dating relationship, such as passion and love during the courtship, are also associated with subsequent marital outcomes (Niehuis et al., 2014). Therefore, if partners want to shape their courtship in a way that best promotes positive outcomes later on, they could instead focus on ways to improve the quality of the relationship early on. For example, partners could choose to invest in exciting and novel experiences that build passion (Aron, Norman, Aron, McKenna, & Heyman, 2000) or learn how to manage conflict and provide effective support when it is needed (Pasch & Bradbury, 1998). These kinds of choices in courtship, in contrast to the choices about the overall shape of the courtship, may help couples establish positive traditions and habits that improve subsequent marital outcomes.

Strengths and Limitations

If there were a significant association between the concrete aspects of couples' courtships and their marital outcomes, the studies assembled here were ideally suited to find it for five reasons. First, in contrast to retrospective research that relies on memories of evaluations that are likely to be retrospectively biased (i.e., Kelly et al., 1985; Markman, 1981; Niehuis et al., 2014), we examined concrete aspects of couples' courtships. Where couples met, how long they dated, whether they were friends prior to dating, and whether they lived together before marriage, were all aspects of the courtship experience that spouses agreed upon despite being interviewed independently, and that our research team agreed on when coding from their audio-recorded interviews. Thus, we can be sure that these measures of courtship were reliable. Second, the studies all included the same two measures of marital satisfaction, the Semantic Differential

(SMD; Osgood et al., 1957) and the Quality of Marriage Index (QMI; Norton, 1983). Each of these measures was reliable for husbands and wives across all eight waves of assessment in each of the four studies. This allows us to be certain that the effects observed (or lack of significant effects in this case) were not idiosyncratic to a particular survey instrument. Third, the studies followed couples every 6 months over the first 4 years of marriage. The longitudinal design allowed us to examine the effects of these courtship experiences on trajectories of marital satisfaction over several years of marriage, so we can be certain these effects are not unique to a particular time in couples' lives. We also were able to analyze possible effects on marital quality intercepts, marital quality slopes and marital status, so we can be certain the lack of significance was not idiosyncratic to a particular marital outcome. Fourth, because we sampled newlywed couples, we have minimized the likelihood of selection effects caused by couples leaving the sample early due to divorce. Finally, we examined the possible associations between courtship and marital outcomes in four independent studies of first-married couples across the nation spanning over a decade (1991-2005). In the present studies, there were occasions when a significant effect emerged sporadically, as had been found in some of the prior inconsistent research on this topic. However, by replicating the non-significant patterns of association across all four of these studies, it ensured that we did not draw any strong conclusions from spurious results. These strengths give us confidence in the conclusion that, at least for this population, these courtship experiences do not have downstream implications for marital outcomes.

Despite our confidence in this conclusion there are still limits that should be kept in mind. First, although these findings may generalize to the young, first-married newlyweds that we sampled, cohabiting unmarried couples, older couples, or remarried couples, for example, may experience different courtships that may be more or less influential for downstream

relationship outcomes. We recognize that the present studies were not designed to yield a nationally or globally representative sample, thus it is important to consider the possibility that courtship might predict marital outcomes differently with a broader range of people. Second, the sampling strategy systematically recruited individuals who were married. Although our findings suggest that the decisions couples make in courtship might not predict how happy or long-lasting couples' marriages are, they might instead predict whether couples get married in the first place. These studies do not have the appropriate data to estimate the base rates for these decisions in the population of dating people, as compared to our sample of married people, so future research should examine whether courtship decisions predict other important premarital relationship outcomes, such as the likelihood for cohabitation, engagement, or marriage. Third, each of the four studies examined in the present investigation followed these newlywed couples over the first four years of their marriage. It is possible that the decisions couples made in courtship may influence marital outcomes only over longer periods of time.

Conclusions

Courtship has been changing. Couples are dating less, and hooking up more (Bogle, 2007). The age of marriage for some demographic groups is much later than in the past (United States Census Bureau, 2008), and the rates of cohabitation in particular have increased dramatically (Manning & Stykes, 2015). Observing these changes has led some to wonder, and even express concern over, whether the evolving path to marriage is changing marriage itself. The results reported here suggest that such concerns are unfounded. Regardless of where they met, how long they waited to marry, whether or not they lived together before the wedding, and whether they were friends before dating, all of the couples in these four studies had an equal

chance of having a satisfying and long-lasting marriage. When it comes to premarital courtship, all roads are equally likely to lead to romance.

Table 1. Demographics by Sample

		Sample 1 N = 60	Sample 2 N = 172	Sample 3 N = 82	Sample 4 N = 169
Age M (SD)	Husbands	25.4 (3.4)	25.4 (3.4)	25.1 (3.3)	25.5 (4.1)
	Wives	24.0 (2.9)	26.0 (3.4)	23.7 (2.8)	23.8 (3.6)
Years of Education M (SD)	Husbands	15.6 (2.2)	15.6 (2.2)	16.4 (2.2)	16.5 (2.3)
	Wives	15.6 (1.6)	16.2 (2.0)	16.4 (1.8)	16.3 (2.0)
Annual Income Median	Husbands	\$11K–\$20K	\$21K–\$30K	\$5K–\$10K	\$5K–\$10K
	Wives	\$11K–\$20K	\$11K–\$20K	\$5K–\$10K	\$0K–\$5K
% Caucasian	Husbands	75%	67%	83%	94%
	Wives	75%	61%	89%	86%

Note. The relatively low income level of participants in Samples 3 and 4 reflects the fact that a large proportion were full-time students at the baseline assessment.

Table 2. Intraclass correlations and percent agreement between spouses' reports of their premarital experiences

Variable	Sample 1	Sample 2	Sample 3	Sample 4
Total Length Known (in months)	0.98	0.91	0.92	0.86
Length Known Prior to Dating (in months)	0.97	0.81	0.75	0.86
Length Dating to Engagement (in months)	0.90	0.95	0.87	0.67
Length of Engagement to Marriage (in months)	0.53	0.87	0.91	0.86
Where the Couple Met	75%	85%	82%	83%
Prior Friendship	69%	85%	83%	85%
Prior Cohabitation	97%	92%	100%	96%

Table 3. Correlations between couples who met via work, school or church (vs. not) and covariates

Covariate	Sample 1		Sample 2		Sample 3		Sample 4	
	H n = 58	W n = 59	H n = 155	W n = 146	H n = 76	W n = 77	H n = 136	W n = 133
Age ^a	-.07	-.17	-.23**	.04	-.09	.01	-.22*	-.10
Education ^a	.11	.15	.16*	.13	.09	.11	.16	-.16
Parental Divorce ^b	.17	-.12	-	-	-.05	-.30**	-.08	.08
# of prior relationships ^a	-.11	-.12	-	-	-.20	-.05	-.09	-.10
Self-esteem ^a	.18	.05	-.04	-.21*	-.04	.03	.08	.05
Personality (Big 5 Inventory)								
Extraversion ^a	-	-	.01	-.04	-.16	-.14	-.06	-.15
Agreeableness ^a	-	-	.07	.07	-.15	.10	-.09	-.09
Neuroticism ^a	-	-	-.13	.08	-.17	-.21	-.06	.03
Conscientiousness ^a	-	-	.09	.13	.24*	-.05	-.02	-.14
Openness ^a	-	-	-.01	.14	-.06	-.11	.06	-.13
Neuroticism (EPQN) ^a	.18	.01	.10	-.01	-.07	-.21	.03	-.07

Note. ^a We conducted t-tests to examine differences among those who met at work, school or church as compared to those who met through one of the other two coding categories for the continuous covariates. These t-values were then converted to correlation coefficients to facilitate comparisons in the present table. ^b As parental divorce is a dichotomous variable, differences in meeting through work, school or church versus the other two categories were examined using Chi-Square tests, which were then also converted to correlation coefficients to facilitate comparisons. * $p < .05$, ** $p < .01$.

Table 4. Correlations between couples who met via their social network (vs. not) and covariates

Covariate	Sample 1		Sample 2		Sample 3		Sample 4	
	H n = 58	W n = 59	H n = 155	W n = 146	H n = 76	W n = 77	H n = 136	W n = 133
Age ^a	.12	.09	.12	-.06	.03	-.05	.22*	.13
Education ^a	.06	-.02	-.13	-.07	.05	-.05	-.03	.12
Parental Divorce ^b	-.19	.07	-	-	.06	.22	.01	-.03
# of prior relationships ^a	-.04	.03	-	-	.26*	.05	-.04	.03
Self-esteem ^a	-.29	-.14	.05	.19*	-.01	.04	-.04	-.08
Personality (Big 5 Inventory)								
Extraversion ^a	-	-	-.04	.01	.05	.29*	-.02	.18
Agreeableness ^a	-	-	.01	-.09	-.05	.02	.04	.07
Neuroticism ^a	-	-	.04	-.03	.26*	.12	.03	-.01
Conscientiousness ^a	-	-	-.04	-.09	-.27*	.14	.12	.07
Openness ^a	-	-	.05	-.04	-.03	.12	-.05	.04
Neuroticism (EPQN) ^a	-.18	-.07	-.01	.06	.12	.13	-.07	.05

Note. ^a We conducted t-tests to examine differences among those who met through their social network as compared to those who met through one of the other two coding categories for the continuous covariates. These t-values were then converted to correlation coefficients to facilitate comparisons in the present table. ^b As parental divorce is a dichotomous variable, differences in meeting through the social network versus the other two categories were examined using Chi-Square tests, which were then also converted to correlation coefficients to facilitate comparisons. * $p < .05$.

Table 5. Correlations between couples by chance (vs. not) and covariates

Covariate	Sample 1		Sample 2		Sample 3		Sample 4	
	H n = 58	W n = 59	H n = 155	W n = 146	H n = 76	W n = 77	H n = 136	W n = 133
Age ^a	-.05	.17	.22*	.04	.09	.16	.07	-.01
Education ^a	-.25	-.26	-.09	-.13	-.07	-.21	-.33*	.11
Parental Divorce ^b	.01	.07	-	-	-.01	.17	.11	-.07
# of prior relationships ^a	.22	.17	-	-	-.05	.01	.29*	.15
Self-esteem ^a	.08	.15	-.01	.07	.07	-.21	-.10	.03
Personality (Big 5 Inventory)								
Extraversion ^a	-	-	.05	.08	.31*	-.42*	.18	-.01
Agreeableness ^a	-	-	-.14	.04	.16	-.38	.13	.05
Neuroticism ^a	-	-	.18	-.12	-.10	.33	.08	-.05
Conscientiousness ^a	-	-	-.09	-.10	.01	-.26	-.19	.15
Openness ^a	-	-	-.08	.35**	.14	-.02	-.03	.18
Neuroticism (EPQN) ^a	-.06	.04	-.18	-.10	-.05	.31	.09	.05

Note. ^a We conducted t-tests to examine differences among those who met in a chance encounter or through a dating service as compared to those who met through one of the other two coding categories for the continuous covariates. These t-values were then converted to correlation coefficients to facilitate comparisons in the present table. ^b As parental divorce is a dichotomous variable, differences in meeting in a chance encounter or dating service versus the other two categories were examined using Chi-Square tests, which were then also converted to correlation coefficients to facilitate comparisons. * $p < .05$, ** $p < .01$.

Table 6. Correlations between total length of time known (in months) and covariates

Covariate	Sample 1		Sample 2		Sample 3		Sample 4	
	H n = 60	W n = 60	H n = 172	W n = 172	H n = 80	W n = 82	H n = 161	W n = 156
Age	.08	.11	-.12	.06	.22*	.12	-.09	.01
Education	.03	.03	-.05	.11	.32**	.09	.01	.02
Parental Divorce ^a	.16	.02	-	-	-.01	-.16	-.16*	.18*
# of prior relationships	-.10	-.29*	-	-	-.07	-.27*	-.26*	-.24**
Self-esteem	-.07	-.01	.20*	-.11	-.13	-.08	-.07	-.03
Personality (Big 5 Inventory)								
Extraversion	-	-	.05	-.01	-.03	.12	-.10	.01
Agreeableness	-	-	.02	.02	-.08	.14	-.08	-.05
Neuroticism	-	-	-.13	.06	.09	-.14	-.01	.01
Conscientiousness	-	-	.12	.02	.10	.06	-.01	-.13
Openness	-	-	-.05	.03	.05	-.12	-.11	-.11
Neuroticism (EPQN)	-.28*	-.01	.20*	-.05	.08	-.09	-.12	.07

Note. ^a As parental divorce is a dichotomous variable, t-tests were run to examine differences in the total length of time known. These t-values were then converted to correlation coefficients to facilitate comparisons in the present table. * $p < .05$, ** $p < .01$

Table 7. Correlations between length of time known prior to dating (in months) and covariates

Covariate	Sample 1		Sample 2		Sample 3		Sample 4	
	H n = 60	W n = 60	H n = 172	W n = 172	H n = 81	W n = 81	H n = 135	W n = 137
Age	-.05	-.06	-.01	.05	.16	.01	-.05	-.10
Education	-.03	-.05	-.08	.07	.06	-.05	-.11	-.04
Parental Divorce ^a	.16	.10	-	-	-.24**	-.13	-.15	.04
# of prior relationships	.01	-.24	-	-	.14	-.03	-.04	-.07
Self-esteem	-.12	.15	.04	-.06	.06	-.03	-.24**	-.01
Personality (Big 5 Inventory)								
Extraversion	-	-	.09	.10	-.09	.03	-.12	.08
Agreeableness	-	-	.12	-.01	-.05	.14	.01	-.09
Neuroticism	-	-	-.11	-.01	-.04	-.03	.19*	-.02
Conscientiousness	-	-	.10	.10	.05	.05	-.13	-.21*
Openness	-	-	.03	.10	-.01	-.04	-.06	.03
Neuroticism (EPQN)	-.21	-.06	.10	.08	-.13	-.05	.06	.10

Note. ^a As parental divorce is a dichotomous variable, t-tests were run to examine differences in the total length of time known. These t-values were then converted to correlation coefficients to facilitate comparisons in the present table. * $p < .05$, ** $p < .01$

Table 8. Correlations between length of time dating before engagement (in months) and covariates

Covariate	Sample 1		Sample 2		Sample 3		Sample 4	
	H n = 60	W n = 60	H n = 172	W n = 172	H n = 76	W n = 81	H n = 103	W n = 110
Age	.11	.24	-.14	.06	.15	.16	.01	.05
Education	.06	.05	.04	.10	.39**	.18	-.01	-.02
Parental Divorce ^a	.07	-.20	-	-	.18	-.08	-.09	.04
# of prior relationships	-.14	-.23	-	-	-.17	-.19	-.22*	-.23**
Self-esteem	.06	-.11	.18*	-.10	-.10	.15	.01	-.09
Personality (Big 5 Inventory)								
Extraversion	-	-	-.08	-.09	-.12	.08	-.06	.03
Agreeableness	-	-	-.07	.04	-.10	-.01	-.01	-.12
Neuroticism	-	-	-.01	.11	.20	-.12	.01	-.03
Conscientiousness	-	-	.05	-.07	.09	.10	-.07	-.20*
Openness	-	-	-.05	-.04	.09	-.14	-.20*	-.26**
Neuroticism (EPQN)	-.12	.09	.14	-.13	.20	-.07	-.20*	.02

Note. ^a As parental divorce is a dichotomous variable, t-tests were run to examine differences in the total length of time known. These t-values were then converted to correlation coefficients to facilitate comparisons in the present table. * $p < .05$, ** $p < .01$

Table 9. Correlations between length of time engaged (in months) and covariates

Covariate	Sample 1		Sample 2		Sample 3		Sample 4	
	H	W	H	W	H	W	H	W
	n = 60	n = 60	n = 172	n = 172	n = 81	n = 82	n = 159	n = 159
Age	.21	.01	-.11	-.06	.02	-.02	.04	.16*
Education	.17	.29*	.01	-.03	-.11	-.01	.08	.22**
Parental Divorce ^a	.13	.10	-	-	-.18	.07	-.24**	.25*
# of prior relationships	-.04	-.07	-	-	-.02	-.24**	-.22**	-.02
Self-esteem	-.09	-.26	.17*	-.01	-.07	.11	.04	.06
Personality (Big 5 Inventory)								
Extraversion	-	-	.13	-.06	.12	.12	-.02	-.10
Agreeableness	-	-	-.06	-.01	-.04	.13	-.02	.07
Neuroticism	-	-	-.13	-.02	.05	-.06	.05	-.01
Conscientiousness	-	-	.02	-.02	.05	-.06	.10	.06
Openness	-	-	-.12	-.13	-.01	-.02	.05	.05
Neuroticism (EPQN)	-.17	-.12	.09	-.06	-.03	.02	-.01	.04

Note. ^a As parental divorce is a dichotomous variable, t-tests were run to examine differences in the total length of time known. These t-values were then converted to correlation coefficients to facilitate comparisons in the present table. * $p < .05$, ** $p < .01$

Table 10. Correlations between prior friendship and covariates

Covariate	Sample 1		Sample 2		Sample 3		Sample 4	
	H n =58	W n =60	H n = 135	W n = 134	H n = 82	W n =82	H n = 169	W n = 169
Age ^a	-.38*	-.33*	-.10	-.06	-.09	.14	-.09	-.14
Education ^a	-.04	-.11	.09	-.02	.15	.04	-.03	-.24**
Parental Divorce ^b	.07	-.05	-	-	.03	-.20	.02	.18*
# of prior relationships ^a	-.18	-.03	-	-	-.17	-.03	-.10	-.04
Self-esteem ^a	.18	.14	-.05	-.06	-.01	.08	.04	.02
Personality (Big 5 Inventory)								
Extraversion ^a	-	-	.03	-.01	-.10	-.05	-.07	-.03
Agreeableness ^a	-	-	.12	.02	-.10	.10	-.02	.09
Neuroticism ^a	-	-	-.18*	-.04	-.05	-.25*	-.07	-.01
Conscientiousness ^a	-	-	.09	-.01	.20	.08	.10	-.01
Openness ^a	-	-	.05	.05	.03	-.18	-.02	-.02
Neuroticism (EPQN) ^a	-.05	-.01	.17	-.06	-.09	-.23*	-.05	-.01

Note. ^a To examine differences in friendship prior to dating as a function of the continuous covariates, we conducted t-tests, which were then converted to correlation coefficients to facilitate comparisons. ^b As parental divorce is a dichotomous variable, differences in prior friendship were examined in Chi-Square tests, which were then converted to correlation coefficients to facilitate comparisons. * $p < .05$, ** $p < .01$.

Table 11. Correlations between prior cohabitation and covariates

Covariate	Sample 1		Sample 2		Sample 3		Sample 4	
	H	W	H	W	H	W	H	W
	n = 60	n = 60	n = 171	n = 172	n = 82	n = 82	n = 169	n = 169
Age ^a	-.11	-.22	.02	.22	.31**	.15	.12	.14
Education ^a	-.09	-.32*	.06	.08	-.01	.24*	.05	.10
Parental Divorce ^b	.08	.11	-	-	.18	.12	.01	.29***
# of prior relationships ^a	.10	.39*	-	-	.26*	.21	.09	.15
Self-esteem ^a	.09	.11	.06	-.07	.04	.30*	-.07	-.06
Personality (Big 5 Inventory)								
Extraversion ^a	-	-	.03	-.03	.02	.15	.01	-.03
Agreeableness ^a	-	-	.01	-.04	-.05	-.12	-.07	-.01
Neuroticism ^a	-	-	-.05	.08	.02	-.17	.23**	.14
Conscientiousness ^a	-	-	-.12	.09	-.09	.11	-.08	-.04
Openness ^a	-	-	.14	.28***	-.03	.08	.08	.17*
Neuroticism (EPQN) ^a	.27	.05	-.12	-.20*	.10	-.19	.12	.18*

Note. ^a To examine differences in cohabitation as a function of the continuous covariates, we conducted t-tests, which were then converted to correlation coefficients to facilitate comparisons.

^b As parental divorce is a dichotomous variable, differences in cohabitation were examined in Chi-Square tests, which were then converted to correlation coefficients to facilitate comparisons.

* $p < .05$, ** $p < .01$, *** $p < .001$.

Table 12. Correlations between premarital experiences and divorce

Covariate	Sample 1 n = 57		Sample 2 n = 137		Sample 3 n = 82		Sample 4 n = 169	
	H	W	H	W	H	W	H	W
Total length known ^a	-.10	-.11	-.06	-.09	-.09	-.14	-.16	-.15
Length known prior to dating ^a	-.04	-.01	-.21	-.23	-.19	-.07	.02	-.05
Length dating before engagement ^a	-.15	-.15	.10	.11	.16	.11	-.15	-.12
Length of engagement ^a	.02	-.23	-.10	-.07	-.28*	-.21	-.13	-.19
Where the couple met ^b								
Met via work, school or church	-.09	-.16	-.12	-.14	-.13	-.14	.09	.07
Met via social network	.04	.15	-.01	-.04	.13	.09	-.08	-.05
Met in a chance encounter or dating service	.07	.03	.17	.24*	.01	.09	-.04	-.03
Prior friendship ^b	-.10	-.10	-.02	-.08	-.21	-.17	.02	.12
Prior cohabitation ^b	.40**	.38**	.06	.05	.08	.08	-.01	.02

* $p < .05$, ** $p < .01$.

Table 13. Association between premarital experiences and marital satisfaction intercepts on two satisfaction measures

Variables		Sample 1 N = 60		Sample 2 N = 172		Sample 3 N = 82		Sample 4 N = 169	
		H	W	H	W	H	W	H	W
Total length known (in months)	SMD	0.05 (0.06)	0.12 (0.06)	0.03 (0.02)	0.01 (0.02)	0.03 (0.05)	0.10 (0.06)	-0.03 (0.02)	0.01 (0.02)
	QMI	0.03 (0.03)	0.04 (0.03)	0.01 (0.01)	0.01 (0.01)	0.01 (0.02)	0.04 (0.03)	-0.01 (0.01)	-0.01 (0.01)
Length prior to dating (in months)	SMD	0.05 (0.07)	0.10 (0.08)	0.05 (0.03)	0.04 (0.03)	-0.06 (0.09)	0.14 (0.08)	-0.12 (0.08)	-0.07 (0.06)
	QMI	0.03 (0.04)	0.04 (0.04)	0.01 (0.02)	0.01 (0.01)	-0.02 (0.04)	0.04 (0.03)	-0.02 (0.03)	-0.04 (0.02)
Length of dating (in months)	SMD	-0.02 (0.09)	0.11 (0.09)	-0.01 (0.03)	-0.05 (0.03)	0.03 (0.03)	0.06 (0.07)	-0.01 (0.04)	-0.01 (0.03)
	QMI	0.01 (0.04)	0.01 (0.04)	0.01 (0.02)	-0.01 (0.01)	0.01 (0.03)	0.03 (0.03)	0.01 (0.02)	-0.02 (0.01)
Length engaged (in months)	SMD	0.38 (0.22)	0.31 (0.17)	0.17 (0.11)	0.02 (0.11)	0.19 (0.14)	0.25 (0.15)	-0.07 (0.08)	-0.04 (0.07)
	QMI	0.15 (0.10)	0.13 (0.08)	0.08 (0.05)	0.02 (0.05)	0.06 (0.07)	0.10 (0.07)	0.01 (0.03)	-0.03 (0.03)
Where the couple met ^a									
Met through work school or church	SMD	4.58 (4.48)	8.41 (5.19)	1.21 (2.52)	-1.67 (2.72)	2.04 (3.26)	4.37 (4.92)	-0.86 (3.31)	-3.09 (2.41)
	QMI	-0.59 (1.99)	2.67 (2.24)	0.10 (1.13)	-0.87 (1.22)	0.86 (1.45)	3.39 (2.17)	-0.74 (1.44)	-1.42 (1.10)
Met through social network	SMD	5.72 (4.82)	-0.30 (5.30)	0.95 (2.68)	-0.96 (2.79)	1.60 (3.48)	0.33 (5.10)	1.07 (3.42)	-0.71 (2.58)
	QMI	0.29 (0.39)	0.20 (0.40)	0.16 (1.19)	0.42 (0.20)*	0.51 (1.54)	-0.16 (0.38)	0.04 (1.50)	0.13 (0.23)
Prior friendship	SMD	2.00 (3.13)	2.49 (3.28)	2.99 (1.99)	2.30 (1.83)	2.65 (2.35)	3.71 (2.52)	-0.77 (1.66)	1.78 (1.52)
	QMI	0.69 (1.39)	1.85 (1.40)	1.55 (0.87)	0.74 (0.80)	1.64 (1.02)	2.18 (1.10)*	-0.73 (0.73)	0.95 (0.69)
Prior cohabitation	SMD	-4.11 (4.02)	-4.00 (4.28)	0.18 (1.75)	0.84 (1.72)	1.89 (3.14)	2.98 (3.40)	-0.32 (1.79)	0.53 (1.61)
	QMI	-2.81 (1.90)	-0.88 (2.04)	0.22 (0.79)	0.61 (0.79)	0.32 (1.48)	0.23 (1.60)	-0.33 (0.10)	0.60 (0.79)

Note. Values represent unstandardized estimates (and standard errors). * $p < .05$, ** $p < .01$. ^a Met through a chance encounter or dating service are used as the reference group here.

Table 14. Association between premarital experiences and marital satisfaction slopes on two satisfaction measures

Variables		Sample 1 N = 60		Sample 2 N = 172		Sample 3 N = 82		Sample 4 N = 169	
		H	W	H	W	H	W	H	W
Total length known (in months)	SMD	-0.01 (0.01)	-0.01 (0.01)	0.01 (0.01)**	0.01 (0.01)**	-0.01 (0.01)	0.10 (0.06)	0.01 (0.01)	-0.01 (0.01)
	QMI	-0.01 (0.01)	-0.01 (0.01)	0.01 (0.01)**	0.01 (0.01)*	-0.01 (0.01)	0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)
Length prior to dating (in months)	SMD	-0.03 (0.01)*	-0.02 (0.01)	0.01 (0.01)	0.01 (0.01)	-0.01 (0.01)	-0.02 (0.01)*	0.01 (0.01)	0.02 (0.01)
	QMI	-0.01 (0.01)	-0.01 (0.01)	0.01 (0.01)	0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)	0.01 (0.01)	0.01 (0.01)
Length of dating (in months)	SMD	0.01 (0.01)	0.02 (0.01)	0.02 (0.01)***	0.02 (0.01)***	0.01 (0.01)	0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)
	QMI	0.01 (0.01)	0.01 (0.04)	0.01 (0.01)*	0.01 (0.01)**	0.01 (0.01)	(0.01) (0.01)	-0.01(0.01)	-0.01 (0.01)
Length engaged (in months)	SMD	-0.08 (0.04)*	-0.03 (0.03)	-0.02 (0.01)	-0.02 (0.01)	-0.02 (0.02)	-0.04 (0.02)	-0.01 (0.01)	-0.01 (0.01)
	QMI	-0.03 (0.02)	-0.01 (0.01)	-0.01 (0.01)	-0.02 (0.01)*	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)	0.01 (0.01)
Where the couple met ^a									
Met through work school or church	SMD	-1.02 (0.77)	-0.80 (0.84)	0.87 (0.37)*	1.34 (0.40)***	0.97 (0.54)	0.93 (0.76)	-0.07 (0.51)	0.70 (0.42) ^b
	QMI	0.18 (0.34)	0.01 (0.37)	0.32 (0.17)	0.60 (0.19)**	0.86 (1.45)	0.06 (0.37)	-0.74 (1.44)	0.37 (0.21)
Met through social network	SMD	-0.45 (0.88)	-0.12 (0.91)	0.56 (0.39)	0.84 (0.41)*	1.11 (0.58)*	0.41 (0.79)	-0.42 (0.53)	-0.11 (0.48) ^b
	QMI	0.29 (0.39)	0.20 (0.40)	0.16 (1.19)	0.42 (0.20)*	0.51 (1.54)	-0.16 (0.38)	0.04 (1.50)	0.13 (0.23)
Prior friendship	SMD	-1.13 (0.55)*	0.35 (0.55)	0.16 (0.29)	0.55 (0.28)*	0.30 (0.40)	0.42 (0.40)	0.62 (0.27)*	0.38 (0.27)
	QMI	-0.30 (0.24)	0.19 (0.25)	0.06 (0.13)	0.36 (0.13)**	0.13 (0.19)	0.08 (0.19)	0.32 (0.13)*	0.14 (0.13)
Prior cohabitation	SMD	0.07 (0.56)	-0.59 (0.56)	-0.29 (0.24)	-0.48 (0.24)*	-0.35 (0.41)	-0.90 (0.40)*	-0.05 (0.27)	-0.41 (0.26)
	QMI	0.01 (0.25)	-0.30 (0.25)	-0.20 (0.11)	-0.23 (0.11)*	-0.27 (0.20)	-0.18 (0.19)	-0.10 (0.13)	-0.18 (0.12)

Note. Values represent unstandardized beta coefficients (and standard errors). * $p < .05$, ** $p < .01$, *** $p < .001$. ^a How the couple met was analyzed with the chance encounter as the reference group. ^b Significantly greater decline in marital satisfaction (as measured by the SMD) among those who met through their social network as compared to those who met through work, school or church.

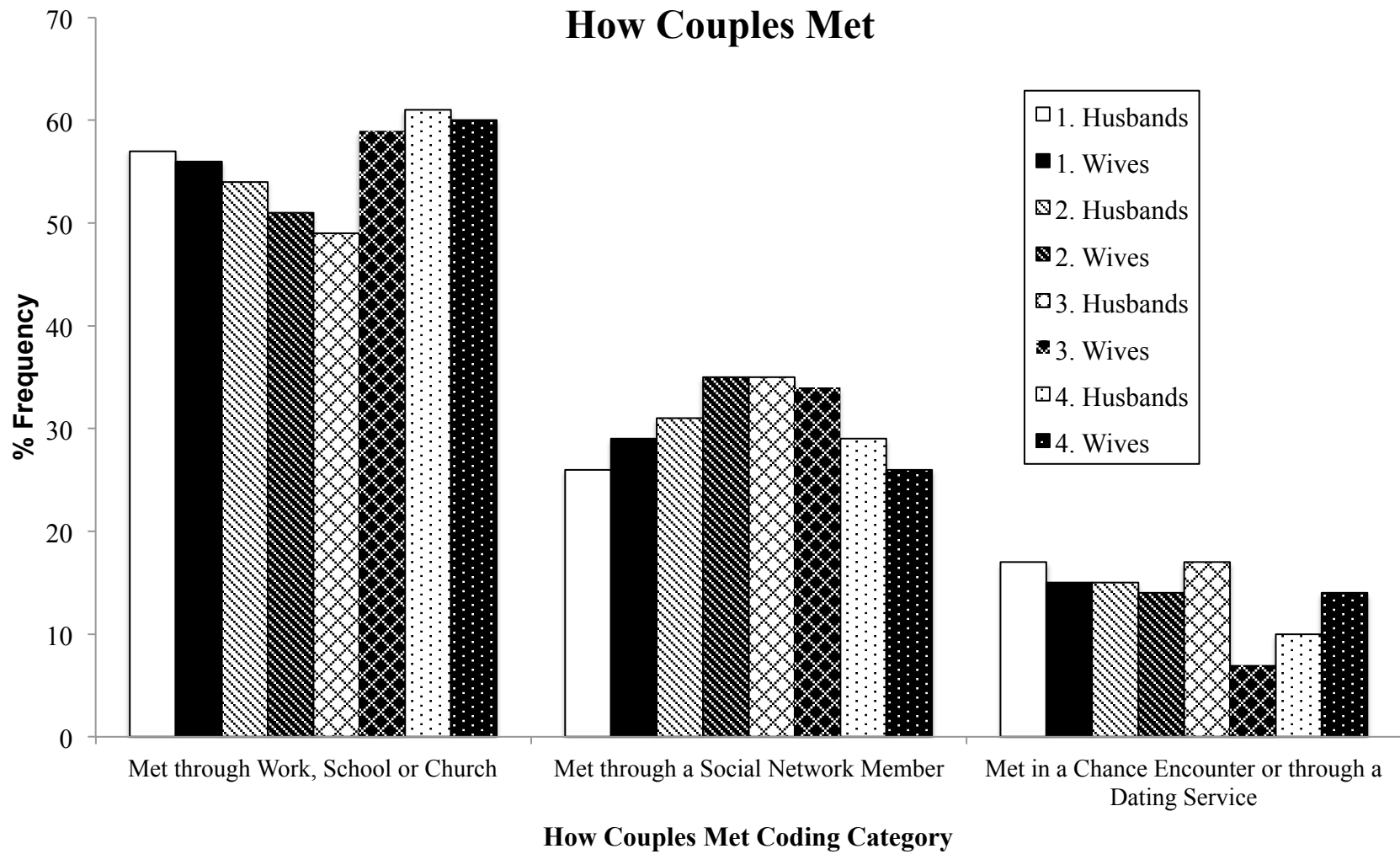


Figure 1. Spouse's report of how they met their partner across Samples 1 - 4.

Spouse's Premarital Relationship History

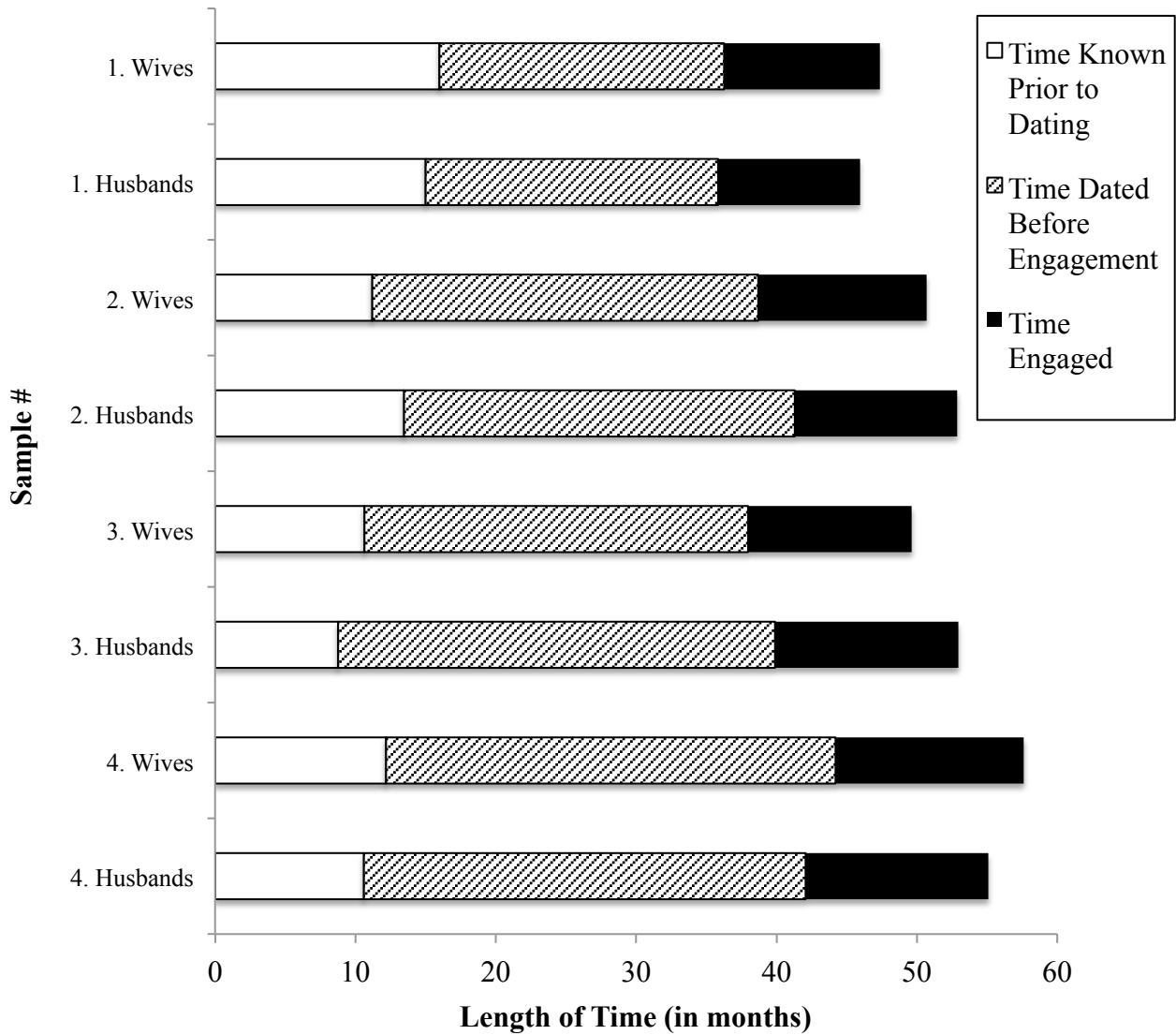


Figure 2. Spouse's self-reported average dating trajectories (length of time they knew each other before dating, dating and engaged) across the four studies for husbands and wives.

% of Spouses Who Were Friends Before Dating

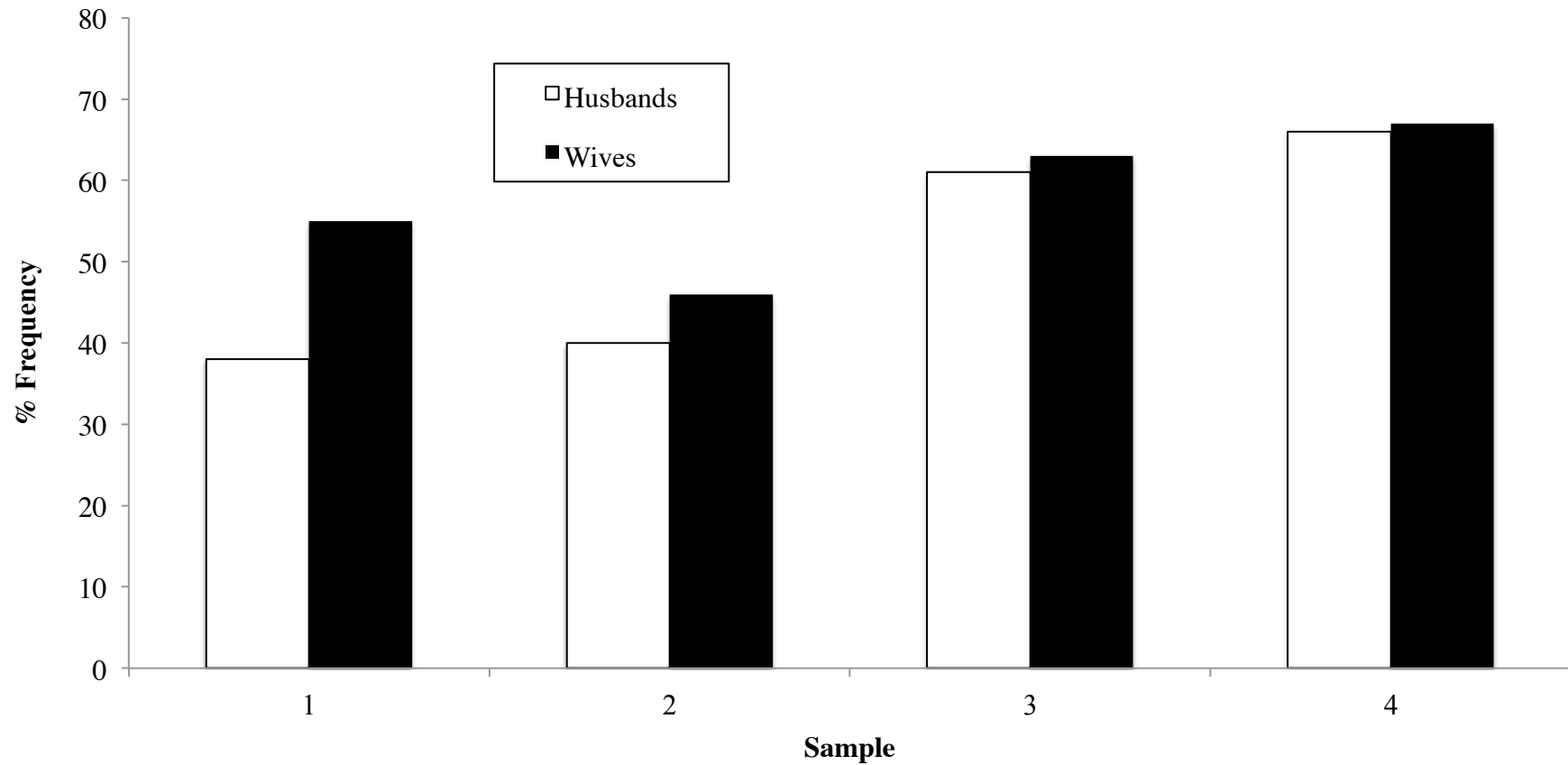


Figure 3. Spouse's report of whether they were friends prior to dating across Samples 1 - 4.

% of Spouses who Cohabited Before Marriage

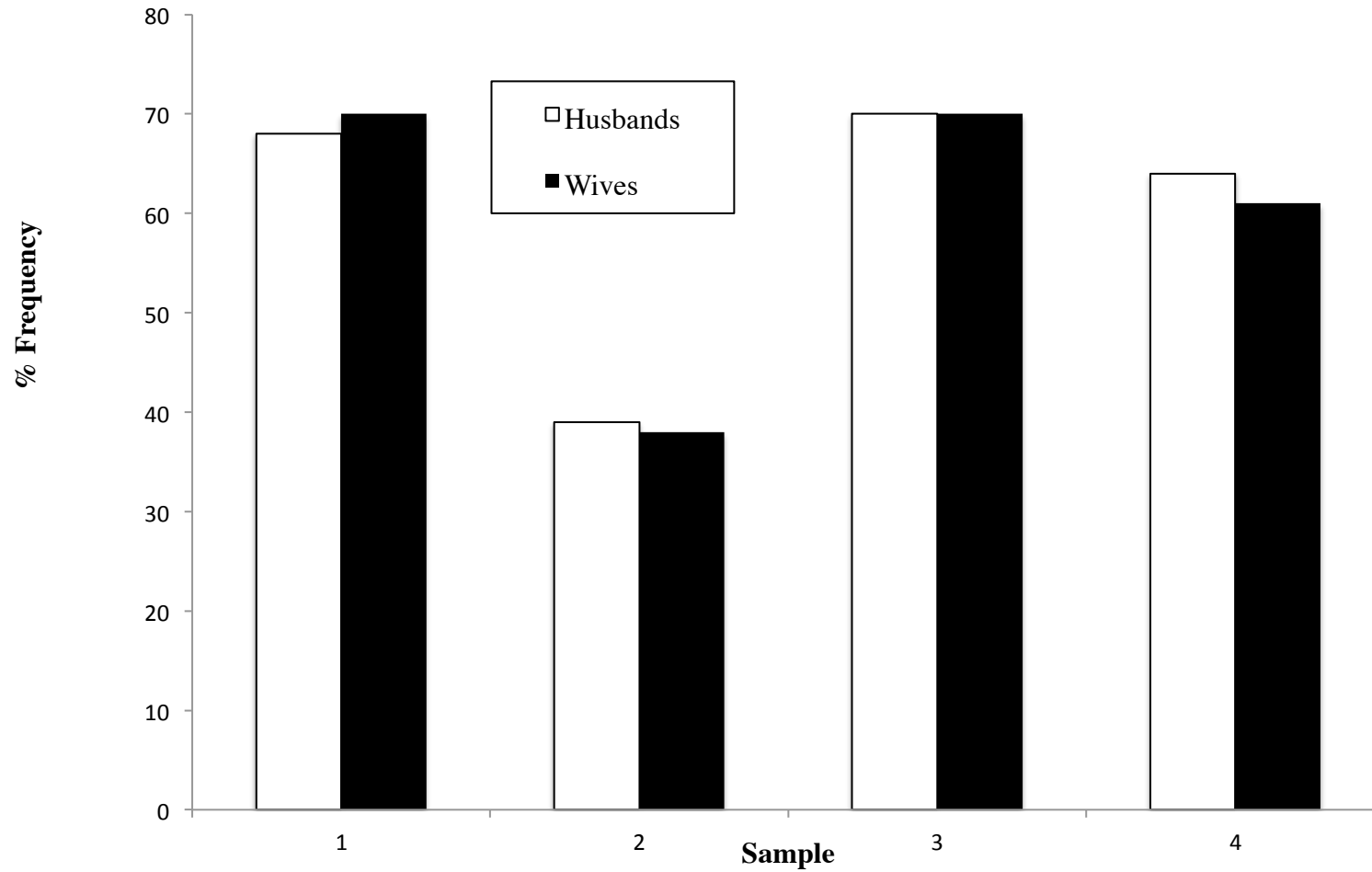


Figure 4. Spouse's report of whether they were cohabited prior to their marriage in Samples 1-4.

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