ABSTRACT

Title of Dissertation: THE PHYSICAL AND MENTAL HEALTH
                                EFFECTS OF ADULT CHILDREN ON
                                FATHERS: A LONGITUDINAL
                                STRUCTURAL EQUATION ANALYSIS

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Men are entering the later stages of life at an unprecedented rate. As fathers and

their children age, a gradual transition in the hierarchy of their relationship occurs,

eventually resulting in fathers being recipients, rather than providers, of care.

Unfortunately, little is known about the effect that adult children (children ages 19 years

old and above) have on fathers' physical and mental health in the middle-to-late stages of

life. Using a sample of 588 fathers who were between the ages of 50- and 80-years-old

and who had at least one adult child, a series of structural equation models using a cross-

lagged panel design were conducted to increase our understanding of 1) the nature of the

associations among fathers' physical health, mental health, relationship quality with their

spouse, and relationship quality with their adult children over time in middle-to-late

adulthood, and 2) how these associations change as fathers age in middle-to-late

adulthood. The findings indicate that fathers' mental health is strongly correlated with

their physical health, marital relationship quality, and relationship quality with their focal child across all age groups of fathers between 57- and 80-years-old. However, a transition seems to occur for fathers between 63- and 68-years-old that increases the within-time salience of fathers' relationship quality with their focal child. In spite of the strong bivariate correlations, the structural equation models revealed high levels of within-trait stability and a lack of cross-trait predictive power among each of these aspects of fathers' lives across age groups. The lone exception to this was in the emergence of a significant effect from father's mental health between the ages of 69- and 74-years-old to their father-child relationship quality six years later, suggesting the possibility of a final transition in father-child relationship dynamics late in fathers' lives.

THE PHYSICAL AND MENTAL HEALTH EFFECTS OF ADULT CHILDREN
ON FATHERS: A LONGITUDINAL STRUCTURAL EQUATION ANALYSIS

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Chapter 1: Introduction

From 2000 to 2010, the fastest growing age group in the United States was the group of individuals aged 45 to 65, followed by the group over the age of 65 (U.S. Census Bureau, 2011b). As the size and growth rate of the older population has been increasing, so too has the average life expectancy. For today's adults who are over the age of 65, the life expectancy has increased from 12.2 years in 1929, to 18.5 years in 2010 (U.S. Census Bureau, 2011a); not only are more men entering the later stages of life than ever before, but they are remaining in those stages of life longer. Given these trends, it is critical that we have a thorough understanding of the factors impacting men's well-being as they transition into and remain in the later stages of adulthood. For example, from 1999 to 2014, the three age groups in the United States with the highest rates of suicide all consisted of groups of men over the age of 45 (Curtin, Warner, & Hedegaard, 2016) and the greatest increase in the rate of suicide was in the group of men over the age of 45 (an increase of 43%; Curtin, Warner, & Hedegaard).

Based on the premise of "linked lives" (Settersten, 2015) within the life course perspective, men's personal developmental trajectories are not isolated, solitary phenomena, but are interconnected with and interdependent upon the development of the other individuals with whom they interact (Settersten, 2015). This interdependence indicates that men's interpersonal relationships are likely to be highly influential in shaping men's well-being across the life course.

Multiple studies have demonstrated that men's interpersonal relationships are associated with their own ratings of life satisfaction (Fuller-Iglesias, 2015), mental health (Almeida, Subramanian, Kawachi, & Molnar, 2011; Fuller-Iglesias, 2015; Silverstein &

Bengtson, 1994), and physical health (e.g., Bartlett, 2004; Berkman, 1995; Condon, Boyce, & Corkindale, 2004; Nielsen et al., 2007; Ryan & Willits, 2007; Steptoe et al., 2004; Uchino, Cacioppo, & Kiecolt-Glaser, 1996). Of these interpersonal relationships, individuals' family ties have been found to be especially influential, demonstrating a more powerful impact than friendships (Almeida et al., 2011; Fuller-Iglesias, 2015) and an individual's gender, education, and income (Ryan & Willits, 2007) on their well-being.

Studies of family ties are often categorized into three types: marital relationships, parent-child relationships, and relationships with extended family (e.g., Ryan & Willits, 2007; Silverstein & Bengtson, 1994) and each type has been found to be associated with men's well-being.

The first type of relationship, marital relationships, consistently has been found to be associated with individuals' mental (Ryan & Willits, 2007; Schoenborn, 2004; Syu, Yu, Chen, & Chung, 2013) and physical health (Bookwala, 2005; Kiecolt-Glaser & Newton, 2001; Schoenborn, 2004; Syrda, 2017; Wilson, 2012); married individuals generally enjoy better mental and physical health (Schoenborn, 2004) and live longer (Kaplan & Kronick, 2006) than their unmarried counterparts. Additionally, of the three common categories of family ties (marital relationships, parent-child relationships, and relationships with extended family), marital relationships have been shown to be most powerfully associated with individuals' reports of well-being (Ryan & Willits, 2007). However, the association between marital relationships and individuals' mental and physical health symptoms appears to be mediated by the quality of the marriage (Bookwala, 2005; Leach, Butterworth, Olesen, & Mackinnon, 2013). In fact, rather than

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providing a protective buffer against physical and mental health deterioration, individuals in low-quality marriages have exhibited increases in negative physical (Bookwala, 2005) and mental health symptoms (Leach et al., 2013).

Moreover, as the life course perspective predicts, the association between individuals' well-being and the quality of their marital relationships is not uni-directional, flowing solely from marital quality to individuals' mental and physical health. Rather, individuals' mental and physical health have also been shown to impact marital satisfaction (Lee, Zarit, Rovine, Birditt, & Fingerman, 2016; Mokhtari, Pollock, Ashtari, & Blick, 2015) and stability (Butterworth & Rodgers, 2008; Mojtabai et al., 2017). Furthermore, evidence also suggests that the quality of individuals' marital relationships is interconnected with the quality of their relationship with their children, such that individuals who have positive relationships with their spouse also tend to have postive relationships with their children (Lee et al., 2016).

With regards to parent-child relationships, important understanding has been gained regarding the impact of fathers on their children's development (e.g., Amato & Gilbreth, 1999; Lamb, 2010; Marsiglio, Amato, Day, & Lamb, 2000). However, relatively few studies have examined the impact of children on their fathers' mental and physical health or the nature of the interplay among those variables. The studies that have examined the effect of children on fathers provide some evidence that children do impact fathers' physical (Bartlett, 2004; Condon, Boyce, & Corkindale, 2004; Nielsen et al., 2007) and psychological well-being (Eggebeen & Knoester, 2001; Kotila & Kamp Dush, 2013; Paulson & Bazemore, 2010; Ryan & Willits, 2007). We know the transition into fatherhood and the postpartum stages of fatherhood are often associated with physical

and psychological strain for fathers that can lead to negative physical and psychological health effects (e.g., Bartlett, 2004; Condon, Boyce, & Corkindale, 2004; Durette, Marrs, & Gray, 2010), including an increase in depression (Paulson & Bazemore, 2010), psychological distress (Durette et al., 2010), sleep disruption (Condon et al., 2004; Durette et al., 2010) and a reduction in marital quality (Twenge, Campbell, & Foster, 2003).

On the other hand, the transition into fatherhood has also been shown to have beneficial effects on fathers, including generating a new sense of identity and purpose (Palkovitz, Copes, & Woolfolk, 2001), greater motivation (Olmstead, Futris, & Pasley, 2009), and hope for a better future (Roy & Lucas, 2006). Furthermore, high levels of father engagement have been shown to be predictive of increases in fathers' self-efficacy and self-esteem and reductions in levels of psychological distress over time (Schindler, 2010). As Bartlett (2004) indicates, the strains the father experiences in the early stages of the child's life (i.e., from birth through the teenage years) may dissipate as the child becomes more independent, allowing the father to experience less role strain and greater benefits of fatherhood over time.

Unfortunately, little is known about the effect that adult children (children ages 19 years old and above) have on fathers' physical and mental health. There is reason to believe that the effects of the parent-adult child relationship on fathers' well-being will be unique to those of the parent-child relationship prior to adulthood. As children enter adolescence, they begin a process of individuation from their parents that extends into adulthood (Buhl, 2007), accompanied by a gradual shift in the dynamics of the parent-child relationship toward greater autonomy (Hill & Holmbeck, 1986) and mutual

reciprocity (Wintre, Yaffe, & Crowley, 1995). As parents and children continue to age, the biological transitions they experience create new relationship contexts (Smollar & Youniss, 1989) in which the direction of support continues to shift from the mutual support exhibited in the child's early adulthood toward more unilateral support from the adult children to their parents, causing adult children to take on greater importance over the well-being of their parents (Fingerman, 2000). This shift in support suggests that an understanding of the influence that adult children will have on fathers later in life cannot be based solely upon information gleaned from studies of fathers and pre-adult children.

In addition to the relatively limited understanding of the impact of adult children on their fathers, our current understanding of the direction of the relationships among each of these constructs (fathers' physical and mental health, their relationships with their spouse, and their relationships with their children) is also limited due to the cross-sectional data used in most studies examining father-child relationships (e.g., Durette et al., 2010; Lee et al., 2016; Paulson, Dauber, & Leiferman, 2010). While various associations among these variables have been demonstrated, the directional nature of the relationships among these variables remains largely unknown, especially as the child enters and progresses through adulthood. The few studies that have used longitudinal data have generally focused on the early stages of fatherhood (when children are younger than 19-years-old) and have only followed the families for relatively short durations of time (e.g., Hernandez, 2012; Nomaguchi & Milkie, 2003). As Hernandez (2012) notes, longitudinal studies that only follow families for a few years "may not be a long enough window to observe health improvements (or declines)…if they take longer to manifest" (p. 250).

The current study therefore, seeks to contribute to the current literature by addressing the following central question: What is the nature of the relationships among fathers' physical health, mental health, relationship quality with their spouse, and relationship quality with their adult children over time? The current study incorporates multiple waves of data, enabling an increase in our understanding of the directional and dynamic nature of the relationships among fathers' physical and mental health, their relationship quality with their spouse, and their relationship quality with their children. Second, the current study uses data that followed families for 12 years, allowing for the development of physical and mental health effects of children on their fathers to be more fully manifested. Third, the use of structural equation modeling techniques allows the relative influential strength that each of these constructs has on one another across time to be analyzed through the simultaneous estimation of the each of those relationships.

The answer to the above question provides insights into several of the key areas affecting men's well-being in the later stages of life. An increased understanding of the factors that contribute to fathers' mental health, such as relationship interactions and quality, can provide greater insights about how to most effectively curtail the rapidly increasing suicide rate among men over the age of 45. An increased understanding of the predictors of fathers' physical health helps generate previously unconsidered options for intervention, or potentially even prevention, that could not only increase fathers' overall longevity, but also increase the amount of time that they enjoy good health, while also decreasing their use of health care services. Expanding our knowledge of how fathers' mental and physical health interrelate, and the potential influence that their interpersonal relationships have on each of those areas of well-being, can enable us to more effectively

direct our finite resources to the areas that are most impactful and more adequately

address programmatic and policy initiatives for men's health.

Chapter 2: Literature Review

This chapter addresses the theoretical framework guiding this study and reviews previous research exploring the factors influencing men's well-being (i.e., men's mental and physical health outcomes). The potential role this research plays in advancing understanding of the factors influencing men's well-being is discussed and the specific research questions and hypotheses addressed within this study are outlined.

Theoretical Framework

Studies of men's lives must be "equipped with a theory that links history, social structures, and individual lives" (Roy, 2014, p. 320). Life Course Theory provides a strong foundation from which to examine the most salient influences on men's well-being over time (Roy, 2014).

According to Life Course Theory, an individual's developmental trajectory is situated within multiple reciprocally influential contexts (Bengtson & Allen, 1993), the first which is related to time. Individuals' lives are positioned within multiple "time clocks" (Bengtson & Allen, p. 480): First is an individual's ontogenetic time, or the individual's personal biopsychosocial development. Second is generational time, or the biogenetic status of individuals within their families (i.e., child, parent, grandparent, etc.), including the attendant roles and expectations associated with those statuses. Third is historical time, referring to the macrosocial events or periods that affect the broader societal context within which the individual resides. Each of these three time clocks is reciprocally influential with the others throughout an individual's life. Thus, an individual's age, physical health, mental health (ontogenetic time), generational status

within the family (generational time) and placement in history (historical time) affect that individual's overarching developmental trajectory, which, in turn, reciprocally influences each of the contexts in which that individual's development occurs.

This distinction among the three forms of time as postulated in Life Course Theory has important implications for conducting studies focused on individuals' development. Due to the reciprocal influence of each of these time frames on one's developmental trajectory, it is important not only to consider the stage of an individual's ontogenetic development (often measured by biological age), but also the cohort location in history (potentially measured by the individual's birth cohort) and the individual's generational status (e.g., child, father, grandfather) in which the ontogenetic development was occurring. The 20th century in the United States was fraught with historical events that could greatly impact individuals' ontological and generational development. The Great Depression of the 1930's, World War II in the 1940's, and the manifestation of various sociocultural ideological shifts such as the civil rights movement of the 1950's and 1960's and the women's movement of the 1960's and 1970's, are all examples of the potential for historical time to profoundly influence individuals' ontogeny and generational development. Men who were born in the 1920's would face much different historical influences than men who were born in the 1970's. Similarly, men who are in similar ontological and cohort historical timeframes, but who differ in generational time (e.g., 25-year-old men in the 1970's who are fathers vs 25-year-old men in the 1970's who do not have children) also face different expectations and influences on their development. Thus, including a measure of each in such studies is necessary in order to

be able to gain the most accurate and comprehensive understanding of individuals'

developmental trajectories and outcomes.

Not only are an individual's own ontogenetic, generational, and cohort historical

trajectories reciprocally influential, but they are also exposed to and reciprocally

influential with the trajectories of other individuals with whom that person interacts

(Hagestad & Settersten, 2017). Thus, one's development is not an isolated, solitary

endeavor, but is linked with the lives of everyone else with whom that person interacts

(Elder, 1991) and "experiences and changes in one person's life ripple through others'

lives" (Marsiglio & Roy, 2012, p. 355). Based on the notions of multiple time clocks and

linked lives within Life Course Theory, then, men's ontogeny and well-being cannot be

fully understood in isolation. To fully understand men's lives, the interpersonal contexts

in which the men develop must also be explored.

In addition to an acknowledgment of the relationships among ontogenetic,

familial, and cohort historical time in an individual's development, Life Course Theory

also recognizes that each aspect of development occurs within a broader social context—

including one's culture and sociostructural location (Bengtson & Allen, 1993). One's

culture shapes the meaning ascribed to life events and provides expectations regarding

appropriate responses to those events (Oliffe, 2007). As Hagestad (1990) notes, the life

course reflects how society gives social and personal meaning to the passage of

biological time. Additionally, the sociostructural location of the individual and family

determine access to resources and opportunities that shape individual and familial

developmental trajectories (Marmot, 2005). Therefore, from a life course perspective,

studies of men's lives must also incorporate an understanding of the social context in which the development occurs.

Life Course Theory recognizes the dynamic nature of change across the life course, resulting in a necessity for a diachronic approach (i.e., one that follows processes over time) to the study of change (Bengtson & Allen, 1993). The strength, type, and continuity of men's interpersonal relationships and the impact that those relationships have on men vary as they age (Rossi & Rossi, 1990) and as they experience transitions within and across the stages of parenting (Galinksy, 1987; Palkovitz & Palm, 2009). Studies of men's lives and of the influences of fathering on men's well-being, therefore, must be able to account for this diversity and dynamic nature of fathering over the life course (Eggebeen, 2002; Roy, 2014).

Influences on Fathers' Well-being

Using the framework of Life Course Theory, in this section I identify and discuss the literature related to fathers' well-being (mental and physical health) in terms of their ontogenetic and generational/familial developmental contexts. In terms of an individual's ontogeny, I discuss the association between men's mental and physical health as they age. I present the literature related to the influence of fathers' familial developmental trajectory on their well-being, beginning with a discussion of the influence of social support on men's health, followed by discussing the influences, first, of marriage and, then, of children on men's well-being. Finally, I discuss the literature related to the linked lives interdependent nature of men's relationships with their children and spouse and their own physical and emotional health.

Ontogenetic Development.

Individuals' ontogenetic development incorporates their mental and physical health as they age. Several studies have demonstrated an association between men's mental and physical health, continuing through middle and late-adulthood (e.g., Bookwala, 2005). Fukukawa and colleagues (2004) conducted a two-year, longitudinal study of 1,802 men between the ages of 40 and 79 and found that physical health problems were predictive of increases in men's depressive symptoms. Similarly, in a 4-year, longitudinal study of 1,532 married individuals who were over the age of 65, Ha and Carr (2005) found that physical limitations were predictive of increases in anxiety and depression. Similar associations have been found between the presence of chronic disease and emotional health in adults over the age of 40 (Heinze, Kruger, Reischl, Cupal, & Zimmerman, 2015).

There is also evidence suggesting the possibility of a bidirectional relationship between mental and physical health. Unützer et al. (2009) found that the costs of healthcare services for older adults with depression were nearly twice that of older adults who did not have depression, even though less than 1% of those total costs involved patients' use of mental health services.

Familial Relationships.

Social Support.

As the concept of linked lives in Life Course Theory asserts, individuals' ontogenetic development is influenced by the people with whom they interact. Studies of the impact of social support on individuals' well-being have supported this claim. Loneliness (i.e., low levels of perceived social support) has been found to be associated

with higher levels of noradrenergic and hypothalamic-pituitary-adrenocortical (HPA) reactivity to stress in middle-aged men and women (Steptoe, Owen, Kunz-Ebrecht, & Brydon, 2004), both of which are associated with detrimental effects on individuals' physical health over time. High levels of social support, on the other hand, have been consistently associated with positive health effects. In a review of 81 studies examining the effects of social support on physiological functioning, Uchino, Cacioppo, and Kiecolt-Glaser (1996) found that high levels of social support were consistently found to be beneficial to individuals' cardiovascular, endocrine, and immune systems. Additionally, Berkman (1995) found that the mortality rates of individuals who suffered from various diseases, including heart disease and cancer, were found to be as much as 3 times lower for individuals with high levels of social support than those who had low social support.

In addition to physical health benefits, social support has also been shown to provide mental health benefits to individuals, including being associated with lower levels of depression (Grav, Hellzèn, Romild, & Stordal, 2012), and buffering the effects of stress on depression (Wang, Cai, Qian, & Peng, 2014). Fukukawa et al. (2004) found that support from family members moderated the relationship between patients' health problems and symptoms of depression as well as the relationship between patients' health problems and declines in physical activities. The negative association between social support and depression has also been demonstrated among individuals suffering from various forms of chronic disease (Manne, Pape, Taylor, & Dougherty, 1999; Mohr, Classen, & Barrera, 2004; Revenson, Schiaffino, Majerovitz, & Gibofsky, 1991).

In spite of the consistent association between mental and physical health and social support, some studies indicate that the influence of social support on individuals' well-being is dependent upon the quality of the relationship between the individuals giving and receiving the support. In a study of the influence of social support on individual's blood pressure during stressful tasks, Gramer and Supp (2014) found that participants who received support from individuals with whom they classified having ambivalent relationships showed higher levels of blood pressure than when they received support from individuals with whom they reported having high quality relationships. In another study of men and women over the age of 60, Fuller-Iglesias (2015) found that relationship quality fully mediated the link between the size of the participants' social support network and their own depressive symptoms, stress levels, and rating of overall life satisfaction. Similarly, Ryan and Willits (2007) also found that the quality of family relationships, rather than the number of family ties, was associated with men's and women's psychological well-being.

Though the influence of social support has been shown to be dependent upon relationship quality, the type of relationship an individual has with those offering support also influences the power of the support. Holt-Lunstadt, Birmingham, and Jones (2008) found that marital quality was a more powerful predictor than other forms of social support of an individual's physical and psychological well-being. Fukukawa et al. (2004) further demonstrated the relative influence of family versus friends in their study of 1,802 Japanese adults between the ages of 40 and 79, in which they found that family support, but not support from friends or other acquaintances, buffered the influence of health problems on adults' subsequent depressive symptoms and physical activity. Likewise,

Fuller-Iglesias (2015) found that the percentage of family members in one's support network was positively associated with one's life satisfaction and negatively associated with one's level of stress, indicating that family members provide more influential levels of support than friends or acquaintances. Furthermore, the association between the percentage of family members in one's support network and one's levels of stress and life satisfaction was not mediated by relationship quality, indicating that the type of relationship one has with his or her support network contributes uniquely beyond relationship quality to one's well-being. However, two caveats in the study by Fuller-Iglesias should be mentioned. First, relationship satisfaction was the only significant predictor of all three indicators of individuals' psychological well-being (depression, stress, and life satisfaction) whereas the composition of the support network was only associated with individuals' reports of stress and life satisfaction (not depressive symptoms). Thus, though social support network composition was uniquely associated with individuals' psychological health, relationship satisfaction was, nonetheless, a more powerful predictor of their psychological health. Second, Fuller-Iglesias did not test whether relationship satisfaction moderated the influence of social support on psychological well-being for individuals with high percentages of family members in their support network. It is possible that, though support from family was more powerfully associated with one's psychological health than support from other sources, for individuals who have high percentages of family in their support network, relationship satisfaction might have still moderated the influence of that support on individuals' mental health, had it been tested. Nevertheless, each of these studies indicate

that support received from family members is more powerfully associated with individuals' physical and mental health than support received from non-familial sources.

Marriage.

The influence of marital relationships on individuals' health has been widely studied and the effects appear to be far-reaching. In a review of 64 articles examining the associations between marriage and individuals' mental and physical health, Kiecolt-Glaser and Newton (2001) found consistent linkages between marriage and a wide range of aspects of individuals' physical and mental health, including measures of pain, physiological reactivity and functioning (e.g., blood pressure, immune system, endocrine system), depression, mood, and behavioral responses (e.g., hostility). Marriage generally appears to be positively associated with individuals' physical health (Lee, Zarit, Rovine, Birditt, & Fingerman, 2016; Schoenborn, 2004; Verbrugge, 1983), mental health (Ryan & Willits, 2007; Schoenborn, 2004) and life satisfaction (Holt-Lunstad, Birmingham, & Jones, 2008). In a study of 612 men and women in Detroit, Verbrugge (1983) found that married individuals were the healthiest. Married individuals have been shown to engage in higher levels of health-promoting behaviors than single individuals, such as obtaining regular healthcare (Clark, Freeman, Kane, & Lewis, 1987), while simultaneously being less likely to engage in high-risk behaviors, such as abusing alcohol and drugs (Gray & Crittenden, 2014). Marriage has also been shown to provide individuals with a turning point in which they turn from past maladative or illegal behaviors toward more productive futures (Laub & Sampson, 2003; Roy & Lucas, 2006).

In addition to direct effects on well-being, marriage has also been shown to have indirect effects. Syu, Yu, Chen, and Chung (2013) found, for example, that the benefits of

engaging in volunteer work on one's own levels of depression were only seen in married individuals; single participants did not experience those benefits.

Marriage also appears to extend individuals' longevity. Kotler and Wingard (1989) examined the relative risk of mortality over an eighteen-year period among 3,700 individuals who were between the ages of 35 and 64 and found that married individuals had lower mortality rates than individuals who were not married. Results from a study of the relative risk of mortality among respondents to the 1989 National Health Survey (NHIS) yielded similar findings (Kaplan & Kronick, 2006).

The potential effects of marital status on individuals' physical and mental health are particularly pronounced in studies of divorce. In a study of suicide rates, Kposowa (2000) found that divorced men were more than twice as likely to commit suicide than married men (being single or widowed was not related to elevated suicide risk). Verbrugge (1983) found that, whereas being married was associated with the best overall health, individuals who were divorced were found to be in worse health than individuals who had never married. Divorced fathers have also been shown to exhibit higher rates of depression than fathers who have not divorced, even after controlling for child residence (Shapiro & Lambert, 1999). Furthermore, Kotler and Wingard (1989) found that individuals who were divorced or separated had higher mortality rates than people who had never married. Kaplan and Kronick (2006) found that the order of mortality was reversed among the never-married and divorced groups. However, across each of the studies, married individuals were shown to exhibit better physical and mental health than all groups of non-married individuals.

As with social support in general, the quality of individuals' relationships with their spouse appears to be an important factor in shaping individuals' physical and mental health. In a longitudinal study of 997 men between the ages of 18 and 65, Hibbard and Pope (1993) found that marital quality was predictive of men's mortality rates, with individuals in high quality marriages experiencing lower mortality rates. Additionally, Ryan and Willits (2007) found that higher marital satisfaction scores were related to a greater sense of psychological well-being. Similarly, Leach, Butterworth, Olesen and Mackinnon (2013) found that the quality of the marriage moderated the association between marital status and an individual's levels of depression and anxiety, such that only individuals in high-quality marriages experienced the mental health benefits of marriage.

On the other side of the spectrum, some studies have also indicated that low-quality marital relationships actually increase one's risk for health problems. In a study of 303 married and single individuals, Holt-Lunstadt, Birmingham, and Jones (2008) found that, whereas individuals in high-quality marriages showed lower blood pressure, stress, depression, and higher satisfaction with life, individuals in low-quality marriages showed no mental health benefits over single individuals and actually had worse blood pressure than single individuals. Furthermore, Bookwala (2005) found that negative, uncaring behaviors by one's spouse were predictive of a greater number of health problems and worse perceived health.

In spite of these general associations between marital quality and mental and physical health, some studies have found contradictory evidence. Ryan and Willits (2007) found that, though marital satisfaction was related to psychological well-being, it was not

related to physical well-being. Hibbard and Pope (1993) found that marital quality was only predictive of lower mortality rates; it was not associated with individuals' risk for developing heart disease, cancer, or having a stroke. Furthermore, Hernandez (2012) found that change in marital status was not related to changes in one's physical health, nor was it predictive of changes in fathers' use of drugs.

There is also evidence calling into question the direction of the relationships between individuals' well-being and marital satisfaction and stability. Mokhtari, Pollock, Ashtari and Blick (2015) found that depression and poor physical health negatively affect individuals' marital satisfaction. Furthermore, husbands' and wives' mental health problems have been shown to be predictive of subsequent divorce (Butterworth & Rodgers, 2008; Mojtabai et al., 2017). Finally, longitudinal research is needed to clarify the relative impact and direction of the relations among men's physical health, mental health, and marital relationship quality.

Children.

The psychological and physical effects of children on fathers present a more complex picture than that of marriage. Multiple studies have demonstrated that fatherhood status (in other words, having a biological child) has an impact on men. The transition to fatherhood is associated with changes in the ways fathers allocate their time, with fathers spending less time socializing (Gray & Anderson, 2010; Knoester, Petts, & Eggebeen, 2007) and engaging in physical activity (Nielsen et al., 2007) and spending more time in childcare (Gray & Anderson, 2010), doing housework (Nomaguchi & Milkie, 2003), and being involved in organizations related to their children's lives, such school boards, children's sports, and religious groups (Eggebeen, Knoester, & McDaniel,

2013). Palkovitz and Palm (2009) posit that fathers' interactions with their children cause them to "experience degrees of disequilibrium that initiate cognitive, behavioral, and emotional change (p. 10). This claim is supported in studies by Hawkins, Amato, and King (2007) and Coley and Medeiros (2007), in which they found that fathers adjust their level of involvement with their children in response to their children's needs.

In addition to behavioral changes, fatherhood is also associated with physiological changes in men, including a reduction in testosterone and increases in prolactin (Gettler, McDade, Feranil, & Kuzawa, 2011) and changes in waist size (Nielsen et al., 2007). Areas in fathers' brains related to emotions, motivation, attention, and empathy have also been shown to be activated by the sound of their infants crying (Rilling, 2013; Swain, Lorberbaum, Kose, & Strathearn, 2007).

In spite of the studies demonstrating the multifaceted impact that fatherhood has on men, the nature of the relationships between these changes and men's overall well-being remains unclear. On the one hand, fatherhood and the presence of children appear to have beneficial physical and psychological effects on men. Using a national sample of 4,809 adults, Clark, Freeman, Kane, and Lewis (1987) found that, for married and single men over the age of 41, the presence of children in the household was associated with better physical health. Hernandez (2012) also found that father involvement showed protective qualities against decline in physical and psychological health. Likewise, using the Panel Study of Income Dynamics (PSID), Smith and Zick (1994) found that married men's risk of mortality decreased as their number of children increased, which may be related to fathers' lower rates of engagement with addictions and violence than non-fathers (Eggebeen, Knoester, & McDaniel, 2013).

Fatherhood has also been shown to have beneficial effects on men's psychological health. Becoming a father can bring men a sense of validation and elevated societal status (Gilmore, 1990). Fatherhood can create a new sense of identity and purpose for men (Palkovitz, Copes, & Woolfolk, 2001), provide them with greater motivation (Olmstead, Futris, & Pasley, 2009), and give them an opportunity at a second chance in life to make a break from past mistakes and failures (Roy & Lucas, 2006). Fathers who are highly involved with their children have been shown to enjoy greater psychological well-being (e.g., Eggebeen & Knoester, 2001; Schindler, 2010) and increases in father involvement have also been shown to be predictive of increases in fathers' psychological well-being (Schindler, 2010).

Additionally, children may provide fathers with protective factors in life. Thomas and Umberson (2017) found that older fathers who received emotional support from their children exhibited less cognitive decline, and Ha and Carr (2005) found that the receipt of emotional support from children and having children who live nearby reduces the psychologically negative effects of loss for older, widowed parents.

On the other hand, fatherhood has also been shown to negatively affect fathers' mental and physical health. Fathers of young children report increases in sleep disruptions, greater psychological distress, and declines in overall health (Condon, Boyce, & Corkindale, 2004; Durette, Marrs, & Gray, 2010). Paulson & Bazemore (2010) found that new fathers experienced increased rates of depression. Durette, Marrs, and Gray (2010) surveyed 126 fathers with children under the age of 4 and found that over 95% of fathers reported moderate or severe physical distress (75% reported severe physical distress) and 99% of fathers experienced psychological distress.

Some studies have shown a more nuanced association between children and fathers' mental and physical health. In a study of 4,252 British men aged 69-70, Lawlor et al. (2003) found a J-shaped association between the number of children and heart disease: men with 2 children had the lowest risk for developing heart disease, significantly lower than men with zero children or one child. However, each additional child beyond two increased the risk of developing heart disease by 12%. Those findings are contrary to findings by Haynes, Eaker, & Feinlieb (1983), in which they found a linear, positive association between the number of children and incidence of heart disease, indicating that the men with children were at greater risk for heart disease than men without children. Additionally, Clark, Freeman, Kane, and Lewis (1987) found that the impact of children on men's health was moderated by fathers' age: having children was associated with poorer health for married men younger than 40-years-old, but was associated with better health for men over the age of 40.

To further complicate the issue, some studies have found no association between the presence of children or the quality of the parent-child relationship and fathers' well-being. Hibbard and Pope (1993) found no association between the parent-child relationship and mortality risk or occurrence of disease 15 years later. Kotler and Wingard (1989) also found that the risk of mortality was unrelated to the presence of children or the number of children in the home. In further support of these findings, Ryan and Willits (2007) found that parent-child relationship quality was only related to fathers' psychological well-being; the number of children and the parent-child relationship quality were unrelated to fathers' physical health. However, Nomaguchi & Milkie (2003) extended the lack of significant effects of parenthood to also include fathers' levels of

depression, marital strain, or self-esteem, only finding that the transition to parenthood decreased new parents' levels of self-efficacy.

The difficulty in determining the exact nature of the associations among these facets of men's lives could, in part, be due to the potential for bidirectional relations in each of these areas. Durette et al. (2010) found that new fathers often simultaneously experienced both positive and negative emotions. In two separate longitudinal studies, Kotila and Kamp Dush (2013) and Hernandez (2012) each found that men's mental health and level of involvement were bidirectional: greater father involvement led to lower levels of depressive symptoms in fathers, but higher levels of depressive symptoms were also predictive of lower levels of involvement. However, even the question of the bidirectional nature of the relationship between involvement and fathers' psychological well-being has yielded mixed results. Schindler (2010) found that early father involvement was a more powerful predictor of parental psychological well-being than vice versa.

The unclear nature of the influence of father-child relationships on fathers' well-being may also be due to the influence of third variables. In the previously mentioned study, Hernandez (2012) found that role strain and child residence both moderated the influence of involvement on fathers' mental health: involved fathers who experienced increases in role strain also showed increases in the likelihood of depression. Additionally, though high involvement generally predicted lower levels of depression, for nonresident fathers, high involvement was predictive of higher levels of depression.

Additionally, Ha and Carr (2005) found the geographic distance between parents and their children played a role in older parents' well-being, even after controlling for

parent-child relationship quality. Older, widowed adults who lived within a one-hour drive from their child reported less psychological distress than widowed parents who lived farther away. Ryan and Willits (2007), on the other hand, did not find the same results: neither the number of children living nearby nor the number of family members living nearby was associated with fathers' physical or psychological health. However, this could be due to the fact that Ryan and Willits specifically sampled older adults who were married.

Adult Children.

The dynamic nature of change over the life course indicates the need for data and analyses specific to each stage of the life course, rather than attempting to extrapolate understanding about one stage of life based upon information gained from the other stages. As Rossi and Rossi (1990) note, "Dependency, dominance, and reciprocal influence do not translate readily from their base in child development research to old parents and middle-aged children…" (p. 6).

The relationship between adult children and parents is unique in several ways. As children enter adolescence, they and their parents enter a co-constructed process of individuation that extends into adulthood (Buhl, 2007). What begins as a relationship of unilateral authority from parents toward their young children is gradually transformed into one of mutual respect and reciprocity (Wintre, Yaffe, and Crowley, 1995). As children's autonomy and capability increase, a gradual shift also takes place in the degree to which each person relies upon the other. Children in late adolescence and early adulthood continue to depend on assistance from their parents (Frank, Avery, & Laman, 1988; Roy, Vesely, Fitzgerald, and Buckmiller Jones, 2010). However, as parents enter

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late adulthood and children enter middle adulthood, the direction of support continues to shift until the children are providing the majority of support toward their parents (Fingerman, 2000). The physiological changes that come with age present children and parents with new tasks that need to be addressed and new relationship contexts in which to address those tasks (Perrig-Chiello & Perren, 2005; Smollar & Youniss, 1989).

As adult children enter into the developmental stage of "filial maturity" (the recognition of parents as individuals with their own needs separate from the parental role; Blenkner, 1965), parents and children must develop mutually satisfying arrangements for caregiving (Campbell & Carroll, 2007) and connectedness and independence (Buhl, 2008). Adult children must also learn to manage the dual role of caregiver to their parents and caregiver to their own children (Rossi & Rossi, 1990). The transitions that parent-child relationships encounter as children enter adulthood indicate the need for analyses and data specific to the relationships between parents and adult children, rather than relying on data gathered from young parents and their young children.

Parent-child relationship quality.

As with other interpersonal interactions, the effect of children on fathers' well-being is often contingent upon the quality of their relationship. Fathers who have positive relationships with their children have been found to have better psychological health than fathers with lower relationship quality (Ryan & Willits, 2007). Ryan and Willits (2007) also found that the parent-child relationship quality, and quality of family ties in general, were more powerfully associated with fathers' psychological well-being than the number of children and the number of extended family members living in the area.

In the Ha and Carr study (2005), though geographic distance from their child(ren) positively impacted widowed adults' overall levels of mental distress, those parents whose children were overly critical or demanding experienced increases in anxiety and grief. Kotila and Kamp Dush (2013) found that parent-child relationship quality was positively associated with father involvement and negatively associated with fathers' depressive symptoms. Additionally, the father-child relationship quality also moderated the association between fathers' involvement and depressive symptoms; for fathers in high-quality relationships with their children, greater involvement was associated with fewer depressive symptoms, whereas for fathers in low-quality relationships with their children, greater involvement led to more depressive symptoms.

Children and marital relationships.

As could be expected through the concept of linked lives, not only are individuals' trajectories interdependent with others, but their relationships with those others are also interdependent. In a meta-analytic review of 97 articles examining the effects of parenthood on marital satisfaction, Twenge, Campbell, and Foster (2003) found that the transition to parenthood is generally associated with declines in marital quality. Additionally, the transition to parenthood, beginning with pregnancy, is also related to a decline in marital sexual frequency (Brewis & Meyer, 2005; Escasa-Dorne, Young, & Gray, 2013).

Regarding the link between marital quality and parent-child relationship quality, fathers' marital satisfaction has been shown to be positively associated with fathers' own relationship quality with their children and the spouse's relationship quality with their children (Lee, Zarit, Rovine, Birditt, & Fingerman, 2016). Roy, Buckmiller, and

McDowell (2008) found that emotional support from their partners encouraged non-resident fathers to be more engaged with their children.

Interdependence of individuals' ontogenetic and familial developmental trajectories.

The lack of clarity related to the influence of children on fathers' mental and physical health could be in large part due to the related and potentially competing simultaneous influences of children and marriage on their well-being. Historically, the transition to parenthood generally occurred in the context of a long-term relationship (Gray & Crittenden, 2014). Thus, the apparent effects of parenthood tended to be confounded by the effects of entering into a long-term relationship (Gray & Crittenden). Verbrugge (1983), for example, found, that although fathers experienced better physical health than non-fathers, the relationship between parenthood and men's physical health was weaker than the relationship between men's marital status and their physical health.

The same has been shown to be true for the difference in fathers' engagement in risky behaviors compared with non-fathers: many of the initial effects appear to be more related to the effects of entering into a long-term relationship than the effects of fatherhood (Eggebeen, Knoester, & McDaniel, 2013). Ryan and Willits (2007) also found that the effects of marriage on men's psychological well-being were more powerful than were the effects of the parent-child relationship. Additionally, Paulson & Bazemore (2010) found that, following the birth of a child, maternal post-partum depression was the most powerful predictor of men's depression, indicating that the effects of fatherhood on men's psychological well-being might be due more to characteristics of the spouse and marriage rather than due to parenthood per se.

In addition to direct effects of marriage, marital status also appears to moderate the effects of children on their fathers. Popay and Jones (1990) and Benzeval (1998) found that single fathers experienced worse physical health than married fathers. Nomaguchi and Milkie (2003) found that the transition to parenthood most negatively affected single individuals' sense of self-efficacy, whereas it showed little effect on the self-efficacy for individuals who were married for the duration of the study. Nomaguchi and Milkie also found that the transition to parenthood was predictive of higher levels of depression for single adults than for married adults.

However, to say that the effects of the marital relationship are more powerful than the effects of the parent-child relationship is not to say that the parent-child relationship is not important. In the study by Ryan and Willits (2007), the effect of the parent-child relationship, though less powerful than the effect of the marital relationship, was still more powerful than the effects of income, education, and the number of family members living nearby. Additionally, Thomas and Umberson (2017) found that the receipt of support from their adult children was predictive of slower cognitive decline in older fathers, even after controlling for the marital relationship and other non-familial sources of support.

Additionally, there is evidence to suggest that children can provide protective effects in the absence of a spouse. In studies by Kotler and Wingard (1989) and Hemström (1996), having a child in the home was associated with lower mortality risk among single fathers. Divorced men with at least one child in the home have also been shown to have fewer health and social problems following their divorce than divorced men without children (Hallberg, 1992). Additionally, Ha and Carr (2005) found that

factors related to the relationship with their adult children, such as shorter geographic distance from their children, receipt of positive support, and high relationship quality, helped assuage grief and anxiety following the death of a spouse.

Diachronic Approaches to the Study of Fathers' Well-being

Methodological Limitations.

The life course perspective recognizes the dynamic (as opposed to static) nature of change and, thus, emphasizes the need for a diachronic approach to the study of individuals and families. Although the need for the use of longitudinal data in studies of fathering has been recognized (e.g., Roy, 2014), the majority of studies on fatherhood have used cross-sectional data, thereby eliminating the possibility of understanding the relative effect and directional nature of each of the most influential facets of men's lives on one another. For those studies that have used longitudinal data, methodological limitations have limited the degree to which patterns of interactions among the important predictors of men's health are able to be discerned.

One methodological limitation present in previous longitudinal studies is related to the duration of the study. Several studies (e.g., Ha & Carr, 2005; Hernandez, 2012; Nomaguchi & Milkie, 2003; Schindler, 2010) followed families for seven years or less. As Hernandez (2012) points out, physical and mental health effects may take longer to manifest than the duration of these studies allow for. Additionally, such short time frames artificially truncate the relational contexts in which development occurs, essentially ignoring the potential for and influence of "sleeper effects" (Rossi & Rossi, 1990, p. 8) that pre-study relationship characteristics could have on fathers' development and well-being.

Second, the focus of most longitudinal studies of fatherhood has been on the early stages of fatherhood—either the transition to fatherhood or fatherhood with a young child or teen (e.g., Hernandez, 2012; Shapiro & Lambert, 1999; Nomaguchi & Milkie, 2003; Schindler, 2010). As noted above, the direction of support between parents and children gradually shifts as children enter adulthood. Thus, the effects of adult-children on older parents are likely to be distinct from those of young children and teenagers. Unfortunately, as Roy (2014) notes, in spite of "a growing commitment to foster longitudinal research…few surveys follow fathers into middle or later life" (p. 328).

A third methodological limitation is related to the nature of the variables used in previous studies. Dichotomous variables involving marital status (e.g., Kotler & Wingard, 1989; Smith & Zick, 1994), parental status (Nomaguchi & Milkie, 2003) and presence of children in the home (e.g., Shapiro & Lambert, 1999) have all been used as predictor variables in studies of interpersonal influences on men's health. Because relationship quality has been shown to be a more accurate and powerful predictor of men's health than the simple presence or absence of a spouse and children, it is important to delve more deeply into the impact of the quality of interpersonal relationships on men's health over time. According to Astone and Peters (2014), there has been "very little research…about how different levels, types, and quality of involvement affect the men themselves" (p. 167).

In addition to the nature of the variables employed in the study, some longitudinal studies (e.g., Butterworth & Rodgers, 2008; Haynes, Eaker, & Feinleib, 1983; Hibbard & Pope, 1993; Kotler & Wingard, 1989) only used baseline data on relationship status to conduct risk analyses for morbidity, mortality, or relationship dissolution. Though

longitudinal, such analytical approaches assume static, rather than dynamic relationships and fail to account for the impact that such change has on men's well-being over time.

Finally, within the studies that incorporate longitudinal data, few examine or allow for the possibility of bidirectional influences among variables or reciprocal relationships among people, opting instead to assume unidirectionality. In studies in which the possibility of bidirectional influences has been explored, however, conventional understanding of the directional nature of relations among the variables has been found to be misrepresentative. Hawkins, Amato, and King (2016), for example, found that, rather than the expected direction of adolescents' well-being resulting from father involvement (i.e., parent effects), father involvement was shown to occur in response to adolescent well-being (i.e., child effects).

Thus, it is important to incorporate a methodology that allows for the emergence of possible bidirectional relationships in studies of fathers' well-being. To date, no known studies have used longitudinal data to examine the potential bidirectional relations among parent-child relationship quality, marital relationship quality, fathers' physical health, and fathers' mental health in fathers' later life. As Roy (2014) notes, "with advances in life expectancies, fathers and children are more likely to share more years in some form of relationship. The reciprocity that develops in these linked lives over time is dramatically understudied and poorly understood" (p. 329).

Advancing the literature on men's well-being in mid-to-late life.

The present study attempted to further the literature on fathers' well-being in mid-to-late life in the following ways:

1) Longitudinal data spanning 17 years were used, allowing for potentially slow-

acting effects of fatherhood and marriage on older fathers' well-being to be manifest. As indicated, these data also followed fathers into mid- and later-life.

2) Multiple waves of data were incorporated into the analyses, allowing for the emergence of patterns of change and influence among each of these areas of influence in men's lives across time.

3) Measures of parent-child relationship quality, rather than the conventional measures of father presence or involvement (Roy, 2014), were used, elucidating the influence that high-quality relationships with their adult children have on men's well-being.

4) Multiple measures were used to construct latent variables related to men's physical health, mental health, relationship quality with their children, and relationship quality with their spouse, increasing the validity associated with assessing the influence of each in men's lives and bringing greater accuracy in uncovering potential relationships among those areas of influence.

5) The use of structural equation modeling allowed for the simultaneous estimation of multiple pathways among each of these areas of influence, thereby more fully clarifying the relative influence and directional nature of each of the constructs on one another.

Research Questions and Hypotheses

This study was designed to answer the following central research questions: 1) What is the nature of the relations among fathers' physical health, mental health, relationship quality with their spouse, and relationship quality with their adult children over time in

middle-to-late adulthood? and 2) How does the nature of these relationships change as fathers age in middle-to-late adulthood?

To answer the research question 1, the following hypotheses were tested:

1) *Hypothesis 1:* The concept of linked lives within Life Course Theory suggests that fathers' physical health, mental health, relationship quality with their adult child, and relationship quality with their spouse would all be positively correlated with one another.

2) *Hypothesis 2:* Fathers' physical health, mental health, relationship quality with their adult child and relationship quality with their spouse would all be significant predictors of each other across all of the fathers' age ranges analyzed (i.e., cross-lagged effects will be present for all variables in each age group). Thus, bidirectional relationships would be manifested among each of these areas of fathers' lives.

3) *Hypothesis 3:* Given the previous research on the relative strength of influence that spouses and children have on fathers' physical and mental health, it was expected that fathers' relationship quality with their spouse would be a more powerful predictor than their relationship quality with their adult children of their own physical and mental health over time.

To answer research question 2, the following hypothesis was tested:

4) *Hypothesis 4:* As fathers in middle-to-late adulthood age and their roles within their families transitioned from a unidirectional hierarchical relationship over their children to one of greater equality, or even receiving care from their children, it was expected that the relative influence of their relationship

quality with their child on their own mental and physical health would increase over time. Thus, the parent-child relationship would be a more powerful predictor of fathers' mental and physical health for older fathers (ages 75 to 80) than for the fathers in the younger age groups (eg. Ages 51 to 56 or ages 57 to 62). Further, as fathers age and the relative number and power of influences outside of their family decreased (for example, through retirement from their profession), it was expected that the relative strength of influence from their spouse and children on their mental and physical health would increase. However, because Life Course Theory posits a reciprocally influential nature of linked lives, cross-lagged effects were still expected to be seen for all variables in each of the age groups.

Chapter 3: Methods

Population

Data for this study were obtained from waves 3 through 7 of the Longitudinal Study of Generations (LSOG; Silverstein & Bengtson, 2016). The LSOG began as a project in 1971 with the intent to examine intergenerational relationships among 300 3-generation families from Southern California. Participants were randomly selected from a population of 840,000 members of a Health Maintenance Organization (HMO). The investigators of the original study selected grandfathers who had 1) a dependent (usually a spouse), 2) at least one living child, and 3) at least one living grandchild between the ages of 16- and 26-years-old. Three hundred and eighty-three grandfathers (which the authors of the original study label as generation 1), 501 adult children (generation 2) and 172 grandchildren (generation 3) were included in the original sample. Each participant responded to a battery of questions assessing individual characteristics (e.g., personal values, beliefs, physical health, and mental health), and familial characteristics (e.g., family structure and levels of conflict, agreement, and emotional connection among family members). The first time a family participated in the study, the parents were asked to select a child about whom they would answer questions related to intergenerational relationships and attitudes (i.e., a focal child). Basic demographic information including age, sex, race, socioeconomic status, and religiosity were also collected. In 1985, the original investigators decided to implement a follow-up with a 2nd wave of surveys, which continued to be administered every 3 years until the year 2000 (i.e., 1988, 1991, 1994, 1997, 2000). In 2005, a final wave of data were collected, yielding a total of 8 waves of data spanning a range of 34 years.

Due to the 14-year time gap from wave 1 to wave 2 and the inconsistent nature of the data collected until wave 3 of the original study, the present study used data beginning with wave 3 (1988).

The establishment of selection criteria for inclusion in the present study was based upon two considerations. First, studies have shown that men's body composition begins to deteriorate after the age of 40 (Walther, Phillipp, Lozza, & Ehlert, 2017). Therefore, in order for negative physical health effects of age to manifest, some time would need to elapse following the beginning of that physical deterioration. Additionally, studies of parent adult-child relationships generally consider children to be adults after they turn 19-years-old (e.g., Lee et al., 2016). Preliminary analyses of the population of fathers within the LSOG dataset who had at least one child who was 19-years-old or older revealed that the minimum age of those fathers was 52-years-old. Setting the minimum age of fathers in the sample to be 50-years-old maximized the likelihood that negative health effects due to age would be manifested while minimizing the number of fathers who were excluded from the study due to the study's interest in examining fathers with adult children. Therefore, to best address the research questions and associated hypotheses of the present study, the following two inclusion criteria were employed: fathers must 1) be at least 50-years-old and 2) have at least one adult child who was at least 19-years-old. It is worth noting that selected fathers could, therefore, theoretically be from any of the three generations within the original study as long as they met those two selection criteria. Sample selection based on those two criteria yielded a total sample size of 588 fathers with at least one child who was at least 19-years-old (266 fathers from generation

1; 322 fathers from generation 2; and 0 fathers from generation 3). At time 3 (the first wave of data used in the present study, 1988), fathers' ages ranged from 52 – 91 (M = 65.83, SD = 8925) and their median household income was between $30,000 and $40,000. Ninety-seven percent of the sample identified as Caucasian. Given this demographic information and the fact that communication among three generations of families was required for participation in the original study, the current study sample is largely representative of relatively intact, Caucasian, middle-class families.

Study Design

A longitudinal study design was required to clarify the directional nature of the relationships among fathers' physical health, mental health, their relationship quality with their adult children, and their relationship quality with their spouse (research question 1), and determine the extent to which those relationships changed over time (research question 2). For the present study, a cross-lagged panel design was utilized, incorporating data from waves 3 (1988), 5 (1994), and 7 (2000) of the LSOG. The decision to use these three waves of data was based upon a confluence of factors: First, because the research questions concern age-related patterns of change across time, I restructured the data to use fathers' age, rather than the specific waves at which time the data were collected, as the metric of time. Using age as the metric of time is useful for studies involving age-related patterns of change across time (Thomas & Umberson, 2017) and in which the data are unbalanced (i.e., each participant does not necessarily contribute to each wave of data; Yang & Lee, 2009), as was the case in this study. This approach has the advantage of allowing data from each individual to be incorporated into the analysis at the time in

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which the individual reached the age of interest, regardless of which wave of data collection was occurring when the individual entered that age.

However, the fact that waves 3 through 7 of data were collected in 3-year intervals, rather than yearly, caused misalignment among individual fathers' ages. For example, some fathers could be 50-years-old during the 3rd wave of data collection (1988), while others could be 51- or 52-years-old in that same year, preventing meaningful direct comparisons from taking place among those fathers in the analysis. To resolve this incongruence, fathers were grouped according to the following 6-year age ranges: 1) 51-years-old to 56-years-old, 2) 57-years-old to 62-years-old, 3) 63-years-old to 68-years-old, 4) 69-years-old to 74-years-old, and 5) 75-years-old to 80-years-old. It is important to note that these age groups did not represent fathers' birth cohort; a separate variable was created to measure fathers' birth cohort. Rather, these age groups were created to track fathers as they aged. The 6-year age range allowed for more substantial numbers of fathers to be grouped together, allowing for meaningful comparisons, while also aligning with the time between two waves of data collection. By using data from waves 3, 5, and 7, each father was ensured to move from one age group to the next between data collection points (i.e., only having one set of data per father per age group) without skipping over an age group between data collection periods. To accommodate the use of age as the metric of time, each time-varying variable was restructured to reflect the age group to which the father belonged at the time the respective variables' scores were obtained (e.g., measures of a father's physical health was restructured to reflect his health at the time he was between the ages of 50- and 55-years-old and again when he was between the ages of 56- and 61-years-old, regardless of whether the scores were obtained

at wave 3, wave 5, or wave 7). Such a study design allowed each of the research questions and associated study hypotheses to be most effectively addressed.

Measures

Parent-child relationship quality.

Parent-child relationship quality was assessed through the creation of a latent variable indicated by the following three measured variables: intergenerational feelings of conflict, affectual solidarity, and overall parent satisfaction.

Intergenerational feelings of conflict. The degree of conflict between parents and their children was assessed using 3 items: 1. "Taking everything into consideration, how much conflict, tension, or disagreement do you feel there is between you and your child at this point in your life?" 2. "How much do you feel your child is critical of you or what you do?" and 3. "How much does your (son or daughter, other) argue with you?" (See Appendix A). Participants are asked to respond to each item using a 6-point Likert scale (1 = *No conflict* to 6 = *A great deal of conflict*). Scores from the 3 items are summed to create a total intergenerational feelings of conflict score ranging from 3 (low conflict) to 18 (high conflict). The Cronbach's alpha reliability coefficient was .80 for the current sample.

Affectual solidarity. Affectual solidarity, defined as "the degree of closeness that is felt between parents and children" (Giarrusso, Feng, Silverstein, & Bengtson, 2001, p. 457), was assessed using the following 5-items: 1. "Taking everything into consideration, how close do you feel is the relationship between you and your study child at this point in your life?" 2. "How is communication between you and your study child exchanging ideas or talking about things that really concern you at this point in your life?" 3.

"Overall, how well do you and your study child get along together at this point in your life?" 4. "How well do you feel your study child understands you?" and 5. "How well do you feel that you understand your parent study child?" (See Appendix B). Participants respond on a scale ranging from 1 (*Not at all*) to 6 (*Extremely well*). Scores are summed to create a total affectual solidarity score ranging from 5 (low affectual solidarity) to 30 (high affectual solidarity). The affectual solidarity reliability coefficient (Cronbach's alpha) was .92 for the current sample.

>***Parent satisfaction.*** Overall satisfaction with being a parent was assessed using one item: "All in all, how satisfied are you with being a parent these days?" Parents are asked to rate their level of satisfaction on a 6-point scale (1 = *Not at all satisfied* to 6 = *Extremely Satisfied*).

Physical health.

The latent variable for physical health was represented by two measures of physical health: A one-item self-assessment of health and the number of chronic problems the participant experienced. A self-reported measure of participants' difficulty with daily activities was initially proposed to be included in the measure of physical health, but the measure did not load onto the physical health latent variable with statistical significance in confirmatory factor analyses. Thus, the measure was dropped from subsequent analyses.

>***Self-rated assessment of overall health.*** Participants' overall feeling of health was assessed through their response to one item: "Compared to people your own age, how would you rate your overall physical health at the present time?" Responses were measured on a 4-point scale (1 = *excellent* to 4 = *poor*).

Number of chronic problems. The measure of number of chronic problems was a composite measure of the total number of chronic health problems the participants identified as experiencing (See Appendix C). Participants were provided a list of 16 potential chronic health problems (e.g., arthritis, diabetes, digestive problems) and were asked to select those that they personally experienced in the past few years. In addition to the 16 listed problems, the respondent also had the option of writing in a chronic problem not listed in the measure. A composite score of chronic problems was created for each wave of data by summing the total number of chronic problems the individual reported having experienced at each wave of data collection. The total number of chronic problems could range from 0 (no chronic problems) to 17 (many chronic problems).

Mental health.

Mental health was represented through the creation of a latent variable using the following three measured indicators: depression, affect balance, and self-esteem.

Depression. The 20-item Center for Epidemiological Studies Depression Inventory (CES-D; Radloff, 1977) measure was used to assess depression (See Appendix E). Respondents are asked to indicate how frequently (1 = *Rarely or none of the time* to 4 = *Most or all of the time*) they had experienced various symptoms of depression within the past week (e.g., "I was bothered by things that don't usually bother me"). Items 4, 8, 12, and 16 were reverse coded prior to summing the scores to create a total depression score. Total possible scores ranged from 20 (low depression) to 80 (high depression). Tests of the psychometric properties of the CES-D have demonstrated high internal consistency reliability and concurrent validity with other measures of depression

(Skorikov & Vandervoot, 2003). The Cronbach's alpha reliability coefficient of the CES-D was .90 with the current sample.

Affect balance. The Bradburn Affect Balance Scale (Bradburn, 1969) is a 10-item measure of positive and negative dimensions of an individual's psychological well-being (See Appendix F). Respondents are given the stem statement, "During the past few weeks, did you ever feel:" and are asked to respond with, "yes", or, "no", to whether they had experienced five positive emotions (e.g., "Pleased about having accomplished something") and five negative emotions (e.g., "Very lonely or remote from other people?"). A total score is obtained for the positive and negative subscales individually by summing the total number of items to which the respondents answered, "yes," for each respective scale. Total scores for each subscale scale can range from 0 to 5. The total number of items endorsed from the negative dimension of affect are then subtracted from the total number of items endorsed from the positive dimension for a total well-being score, which can range from -5 (low well-being) to 5 (high well-being). With the sample for the current study, the reliability (Cronbach's alpha) of the positive affect scale and the negative affect scale were each found to be .69.

Self-esteem. Participants' self-esteem was measured using the Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965), a 10-item measure in which participants rate the degree to which they agree with statements related to how they feel about themselves (e.g., "I feel that I do not have much to be proud of") using a 4-point scale (1 = *strongly disagree* to 4 = *strongly agree*) (See Appendix G). Items 3, 5, 8, 9, and 10 are reverse-coded prior to creating a composite score, following which the scores for the ten items can be summed to create a total self-esteem score. Possible total scores can range from 10

(low self-esteem) to 40 (high self-esteem). The RSES has been shown to have high

convergent and discriminant validity and high internal consistency reliability (Sinclair et

al., 2010). The Cronbach's alpha reliability coefficient was .87 with this sample.

Marital relationship quality.

Marital relationship quality was evaluated through the creation of a latent variable

indicated by 1) the positive and negative scales within the Gilford-Bengtson Marital

Satisfaction Scale (MSS; Gilford & Bengtson, 1979), 2) a measure of support provided

by the spouse, and 3) an assessment of overall marital closeness experienced in the

relationship.

Marital satisfaction scale. The Gilford-Bengtson Marital Satisfaction Scale (See

Appendix H), is an 11-item measure of the frequency with which couples engage in

positive (e.g., "You laugh together") and negative (e.g., "One of you becomes critical and

belittling") interactions with one another. Five of the 11 items reflect positive marital

characteristics and 6 of the 11 items reflect negative marital characteristics. Possible

responses range from 1 (*Hardly ever*) to 5 (*Almost always*). Total scores for the positive

subscale can range from 5 (low positivity) to 25 (high positivity). Total scores for the

negative subscale can range from 6 (low negativity) to 30 (high negativity). Tests of the

psychometric properties of the MSS have supported the 2-factor model of positive and

negative marital sentiment within the MSS and have yielded high internal consistency

reliability coefficients for each scale (Cronbach's alpha = .80; Markides, Roberts-Jolly,

Ray, Hoppe, & Rudkin, 1999). With this sample, the reliability coefficient (Cronbach's

alpha) was .86 for the positive subscale and .80 for the negative subscale. Due to the

independent nature of the trajectories between positive and negative sentiment within

marriage over time (Gilford & Bengtson, 1979), the two scales were used as separate indicators of marital satisfaction in the analyses for the present study.

Perceived marital support. Fathers' perception of marital support received was assessed using the first column ("Spouse/Partner") of the Functional Solidarity scale (See Appendix I). Respondents were asked to select from a list of 3 forms of emotional support (e.g., "Discussing important life decisions") and 6 forms of instrumental support (e.g., "Transportation/shopping") the types of support they receive from their spouse. A total marital functional solidarity score was obtained by adding the total number of "yes" responses. Total scores can range from 0 (no support received) to 9 (receipt of all 9 types of support). The Cronbach's alpha for marital functional solidarity with this sample was .85.

Marital closeness. Participants were asked to indicate their level of closeness with their spouse through their response to the following item: "How close do you feel to your spouse/partner at this time?" Responses were measured on a 6-point scale (1 = *Not at all close* to 6 = *Extremely close*).

Control variables.

The control variables for the present study included the father's race, education, income, the father's birth cohort (to control for historical time), the geographic distance between the father's residence and the residence of his adult focal child, the gender of the adult focal child, the frequency of contact between the father and his adult focal child, the overall social support the father received from the focal child, the social support the father received from sources outside of his spouse and focal child, whether the father had experienced the loss or death of a loved one since the previous wave, whether the father

had grandchildren (indicating generational status), and whether the father had separated from or divorced his spouse since the previous wave. Due to the fact that fatherhood was used as a criterion for inclusion in this study, grandfatherhood was the only distinguishing characteristic of participants' generational status for the current sample and, thus, was the only attribute of generational status to include as a control variable. Each of the other control variables was selected based on evidence of its influence on at least one of the latent variables of interest (e.g., Clark, Freeman, & Kane, 1999; Haynes, Eaker, & Feinleib, 1983; Shapiro & Lambert, 1999). As the only time-invariant control variables, race, the father's birth cohort, and gender of the focal child were coded once for all five of the age groups described in the study design. The remaining control variables were time-variant. Thus, fathers receive scores for each of the time-variant control variables within each of the five age groups.

Race. Race was assessed using a 1-item self-identification of race. Response categories include White, Native Hawaiian/Pacific Islander, Black/African American, Asian, American Indian, and Other.

Education. Respondents' level of education was assessed through their response to the following item: "What was the highest level of education you have attained?" Possible responses ranged from 1 (*8th grade or less*) to 8 (*Post-graduate degree*).

Income. Respondents were asked to indicate their total household income at each wave. For wave 3, response categories were arranged in increments of $10,000, beginning at 1 = *Under $10,000* to 12 = *$110,000 or more.* For waves 5, response categories were arranged in increments of $10,000, beginning at 1 = *Under $10,000* to 16 = *$150,000 or more.* For wave 7, response categories continued through 21 = *$200,000*

or more. For this study, response categories for waves 5 and 7 were collapsed to reflect the information gathered in wave 3. Thus, the final categories ranged from 1 = *Under $10,000* to 12 = *$110,000 or more.* Due to the number of response categories and the relatively small increments between categories, income was treated as a continuous variable for the analyses in this study.

Fathers' birth cohort. Fathers were asked to indicate their birthdate at each wave of data collection. A preliminary analysis showed that the sample was comprised of three general cohorts of fathers: Those who were between the ages of 32 and 45 in 1988 (wave 3 of data collection), those who were between the ages of 55 and 68, and those who were over 77-years-old in 1988. Thus, fathers were coded according to the birth cohort to which they belonged: "1" = belonging to the youngest cohort, "2" = being in the middle cohort, and "3" = belonging to the oldest cohort. Two dummy variables were created and included in the analysis, with the oldest cohort being used as the reference group.

Geographic distance from the adult focal child. Fathers' geographic residential distance from their adult focal child was assessed at each time point. Response categories range from 1 = *Living together* to 7 = *Over 500 miles away*.

Gender of the adult focal child. The gender of the adult focal child was assessed through the use of a dichotomous variable (0 = *Male*, 1 = *Female*).

Frequency of parent-child contact. Frequency of contact between the father and the focal child was assessed through the measure of associational solidarity. Respondents were asked to indicate on a scale from 1 (*Daily*) to 8 (*Not at all*) the frequency with which they had contact with each of their children in person, by phone, by mail, and, beginning in wave 6, by email. The lowest score (indicating the highest frequency of

contact) among all types of contact was used to represent the frequency of parent-child contact. Scores were then reverse-coded so that higher scores indicated higher frequency of contact.

Social support received. Fathers' perceptions of social support received from the focal child and total social support received from sources other than the spouse and focal child were assessed using the Functional Solidarity scale (See Appendix I). Using a list of 9 relationships (e.g., brother(s)/sister(s), friends/neighbors, professional help), respondents were asked to indicate the individuals from whom they receive 3 forms of emotional support (e.g., "Discussing important life decisions") and 6 forms of instrumental support (e.g., "Transportation/shopping"). A total social support score was obtained regarding the focal child by summing the total number of checked responses from the second column ("Study child"). Total possible scores for support received from the focal child ranged from 0 (no support received) to 9 (receipt of all 9 types of support). A total social support score from sources other than the spouse and focal child was obtained by adding the total number of checked responses from columns three, "Other son(s)," through column nine, "Professionals/Paid Helpers." Total possible support scores ranged from 0 (no support received) to 81 (receipt of all 9 types of support from all 9 possible relationships). The Cronbach's alpha for overall social support with this sample was .85.

Death or loss of a loved one. Respondents were asked to indicate whether anyone in their immediate family had died since the previous wave of data collection. Respondents who indicate in the affirmative were given a score of "1". All others received a score of "0."

Grandchildren. At each wave of data collection, fathers were asked to indicate whether they had any grandchildren. Using this information, a dichotomous variable was created to indicate the fathers' grandparenthood status (1 = *Yes,* 0 = *No*).

Separation or divorce. At each wave of data collection, respondents were asked to state their current marital status. A dichotomous variable was created (1 = *Yes*, 0 = *No*) to identify fathers who had experienced a divorce or separation since the previous wave of data.

Data Analysis

Mplus 7 and SPSS 24 were used to complete all data analyses. Following the restructuring of the data mentioned in the study design, a structural equation model incorporating a cross-lagged panel design using maximum likelihood estimation with robust standard errors was conducted using data from waves 3, 5, and 7 as described below (see Figure 1 below for a conceptual model of the proposed analysis). Full information maximum likelihood (FIML) estimation was used for missing data.

To address research question 1, "What is the nature of the relations among fathers' physical health, mental health, relationship quality with their spouse, and relationship quality with their adult children over time in middle-to-late adulthood?" a series of structural equation model analyses were completed. Each of the structural equation model (SEM) analyses were conducted in two stages: a measurement stage and a structural stage (Byrne, 2012). The measurement stage consists of completing a simultaneous confirmatory factor analysis (CFA) for each latent variable using the measured variables assigned as indicators of that latent variable. During this stage, all latent variables are allowed to covary with one another, thereby ensuring that any

detected misspecifications in the model are attributable to the measurement portion of the model, rather than being indicative of misspecifications within the structural relations among the latent variables. Modifications—such as allowing residuals to covary among the measured variables—may be made to the initial measurement model in order to improve the goodness-of-fit between the proposed model and the data if theoretically and practically appropriate.

In the second stage of the SEM analysis, the structural stage, directional constraints are imposed upon the linkages among the latent variables in order to reflect the hypothesized relations among the latent variables. For the present study, paths among latent variables were directed in such a manner that each latent variable from the first age range (51 to 56) was set as predictors of each latent variable from the second age range (57 to 62), which was set to predict each latent variable from the third age range (63 to 68) and so on. The control variables were used as covariates in the model in each of the designated age ranges. For example, each of the latent variables (fathers' relationship quality with the focal adult-child, fathers' physical health, fathers' mental health, and fathers' marital relationship quality) when the father was between the ages of 57 and 62 were simultaneously regressed on each of the latent variables for the time when the father was between the ages of 51 and 56. As with the measurement stage, in the structural stage modifications may be made to improve the fit between the data and the model if theoretically and practically appropriate. Thus, initial goodness-of-fit indices and the theoretical and practical fit of the modification indices were evaluated to determine whether modifications to the structural model should be made. If the final structural model demonstrated good fit with the data, standardized path coefficients among latent

variables were used as indicators of the relative influence of each of the variables of interest on the others at each point in time. Statistically significant path coefficients indicated a statistically significant influence from the given predictor variable to the associated outcome variable.

To address research question 2, "How does the nature of these relations change as fathers age in middle-to-late adulthood?" the path coefficients of each latent variable were constrained to be equal across age groups. For example, the path coefficients for fathers' physical health from ages 51 to 56 were constrained to be equal with the path coefficients for fathers' physical health from ages 57 to 62, 63 to 68, 69 to 74, and 75 to 80. Significant worsening of goodness of fit indices after imposing the path constraints indicate non-invariance across time (i.e., the path coefficients for the latent variables change across time).
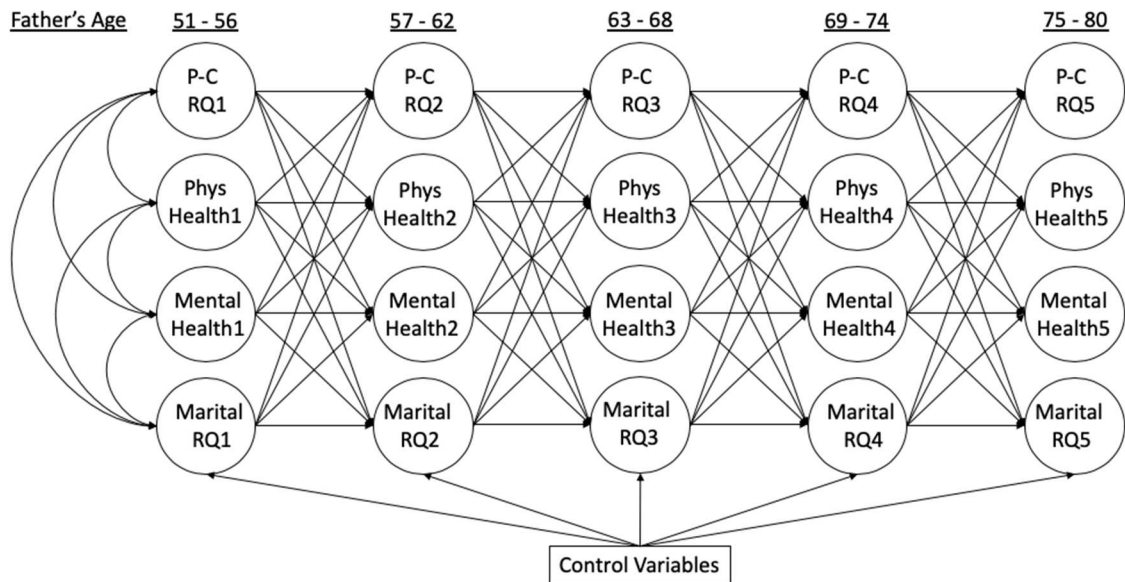
Figure 1. Conceptual Latent Variable Cross-lagged Panel Design Structural Equation Model

Table 1 provides a summary of the analytic strategy used to evaluate each of the proposed study's hypotheses.

Table 1

Hypotheses and Analytic Strategy

Hypothesis	Analytic Strategy
1) Fathers' physical health, mental health, relationship quality with their adult child, and relationship quality with their spouse will all be positively correlated with one another.	Structural equation model analysis examines the covariances among each of the exogenous latent variables (i.e., physical health, mental health, parent-adult child relationship quality, and marital relationship quality). Statistically significant covariances among the exogenous latent variables indicate the presence of a relationship among the latent variables.
2) Fathers' physical health, mental health, relationship quality with their adult child and relationship quality with their spouse will all be significant predictors of each other across all of the fathers' age ranges analyzed. Thus, bidirectional relationships will be manifest among each of these areas of fathers' lives.	Structural equation model analysis examines the path coefficients among each of the latent variables at each age grouping (i.e., 50 to 55, 56 to 61, and so on). Statistically significant standardized path coefficients reflect a statistically significant influence of the given predictor variable on the outcome variable.
3) Fathers' relationship quality with their spouse will be a more powerful predictor than their relationship quality with their adult child of their own physical and mental health over time.	Structural equation model analysis examines the magnitude of the standardized path coefficients among the latent variables. Larger standardized path coefficients between variables reflect greater predictive influence from the given predictor variable to the outcome variable.
4) As fathers in middle-to-late adulthood age, the parent-child relationship will be a more powerful predictor of fathers' mental and physical health for older fathers than for the fathers in the younger age groups. Further, the relative strength of influence from their	Individual path coefficients for each latent variable was constrained to be equal across fathers' age ranges (e.g., the path coefficients for fathers' physical health from ages 50 to 55 were constrained to be equal with the path coefficients for fathers' physical health from ages 56 to 61, 62 to 67, 68 to 73, and 74 to 79). Significant

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spouse and children on their mental and physical health will increase over time.

changes in goodness of fit indices indicate non-invariance across time (i.e., the path coefficients for the latent variables change across time).

Chapter 4: Results

Demographic Characteristics

Table 2 provides the demographic characteristics for the sample, separated by fathers' age groups.

With regard to household income, the highest percentage of fathers aged 57-years-old to 62-years old (35.1%), 63-years-old to 68-years-old (38.5%), and 69-years-old to 74-years-old (41.3%) stated that their total household income was between $30,000 and $59,999. For fathers aged 75-years-old to 80-years-old, the highest percentage of fathers stated that their total household income was less than $30,000 (35.2%), followed closely by fathers whose total household income was between $30,000 and $59,999 (34.1%).

Regarding education, 36% of fathers aged 57-years-old to 62-years-old, 43% of fathers aged 63-years-old to 68-years old, 45% of fathers between the ages of 69-years-old to 74-years-old, and 37% of fathers aged 75-years-old to 80-years-old stated that they had completed college or post-graduate work.

Across all age groups, at least 96% of fathers identified as White and at least 94% stated that they had not experienced divorce or separated from their spouse. Eighty-five percent of fathers aged 57-years-old to 62-years-old stated that they had at least one grandchild. That number increased to over 95% for fathers aged 63-years-old and older.

The mean age of the father's focal child was 35-years-old for fathers between the ages of 57-years-old to 62-years old, 40-years-old for fathers between the ages of 63-years-old to 68-years-old, 45-years-old for fathers between the ages of 69-years-old to 74-years-old, and 50-years-old for fathers between the ages of 75-years-old to 80-years-

old. Approximately 59% of the focal children were female for the group of fathers between the ages of 57-years-old to 62-years-old, approximately 56% were female for both groups of fathers between the ages of 63-years-old to 68-years-old and 69-years-old to 74-years-old, and approximately 58% were female for fathers between the ages of 75-years-old to 80-years-old.

These demographic characteristics indicate that this sample is largely representative of middle-class, relatively well-educated, White fathers who experienced general stability in marriage and family life.

Table 2
Demographic Characteristics

| | Fathers' Age (in years) | | | |
	57 to 62 (n=215)	63 to 68 (n=274)	69 to 74 (n=271)	75 to 80 (n=160)
Income	n (%)	n (%)	n (%)	n (%)
<$30,000	34 (22.1)	44 (22.9)	34 (19.0)	31 (35.2)
$30,000-$59,999	54 (35.1)	74 (38.5)	74 (41.3)	30 (34.1)
$60,000-$89,999	39 (25.3)	34 (17.8)	32 (17.9)	14 (15.9)
>$90,000	27 (17.5)	40 (20.8)	39 (21.8)	13 (14.8)
Education				
Less than high school	11 (7.4)	18 (9.4)	14 (7.5)	13 (14.8)
High school	40 (27.0)	26 (13.6)	23 (12.4)	13 (14.8)
Some college	43 (29.0)	65 (34.0)	65 (35.9)	29 (33.0)
College graduate	25 (16.9)	36 (18.8)	36 (19.4)	9 (10.2)
Post-graduate	29 (19.6)	46 (24.1)	48 (25.8)	24 (27.3)
Race				
White	192 (96.0)	240 (96.4)	233 (97.5)	129 (97.0)
Black	2 (1.0)	3 (1.2)	2 (.8)	3 (2.3)
Latino	4 (2.0)	4 (1.6)	3 (1.3)	1 (0.8)
Other	2 (1.0)	2 (0.8)	1 (0.4)	0 (0.0)
Divorced/Separated				
Yes	208 (96.7)	262 (95.6)	262 (96.7)	150 (93.8)
No	7 (3.3)	12 (4.4)	9 (3.3)	10 (6.3)
Grandchildren				
Yes	134 (84.8)	191 (95.5)	183 (95.3)	92 (96.8)
No	24 (15.2)	9 (4.5)	9 (4.7)	3 (3.2)
Focal Child's Sex				
Male	81 (41.3)	114 (43.5)	115 (43.7)	65 (42.2)
Female	115 (58.7)	148 (56.5)	148 (56.3)	89 (57.8)

Focal Child's Age	M=35.43	M=40.40	M=45.04	M=50.00
	(4.23)	(4.10)	(4.32)	(5.32)

Preliminary Analyses

Data restructuring.

As described in the methods section, the data were restructured to be based on fathers' ages, rather than on the waves of data collection. In other words, data obtained from all fathers who were between the ages of 45-years-old and 50-years-old were grouped together, as were the data for fathers between the ages of 51-years-old and 56-years-old, fathers between the ages of 57-years-old and 62-years-old, and so on. Restructuring the data in this manner revealed a few attributes in the data that required some adjustments to be made to the proposed analyses.

First, restructuring the data revealed that no two cohorts of fathers ever occupied the same age range. For example, fathers who provided data while they were between the ages of 51- and 56-years-old were comprised entirely of the third cohort of fathers (i.e., those who were born between 1943 and 1956), while fathers who completed data while they were between the ages of 57- and 74-years-old were comprised entirely of the second cohort of fathers (i.e., those who were born between 1919 and 1933). This lack of overlap among cohorts prevented the birth cohort covariate from being used in the analyses to control for cohort effects. Additionally, the lack of overlap among cohorts created a hole in the data for the group of fathers between the ages of 51- and 56-years-old. Therefore, the first age group for whom analyses could be conducted was the group of fathers between the ages of 57- and 62-years-old.

Second, parsing the participants into five age groups from three waves of data resulted in fewer participants per analysis group. This had the effect of further reducing the variability of certain variables for which there was already low variability. In particular, race was no longer able to be controlled for because of the lack of non-White participants in each age range.

Additionally, using three waves of data prevented any one individual from providing data for all four age groups of fathers; one individual could only be included in a maximum of three age groups. After initial analyses revealed some variations in the standard errors of the estimates based upon the specific latent outcome variable being analyzed (indicating a lack of uniformity of fathers who responded to each subsection of the LSOG questionnaire at each time point) it was determined to conduct a separate structural equation model for each latent outcome variable. Because the latent outcome (i.e., endogenous) variables in the original proposed study were allowed to fully covary, analyzing each latent outcome variable independently did not result in loss of information about the relations between the predictor variables and the dependent variables; rather, this approach maximized the likelihood of obtaining accurate path estimates between the predictor variables and each specific outcome variable. However, rather than generating a total of four structural equation models (one for each age group being predicted), this approach resulted in the creation of a total of 12 independent structural equation models (one for each of the four dependent variables of interest in each of the three age groups being predicted). Within each model, the indicators of the latent outcome variable were constrained to be equal with the indicators of the same latent variable at the earlier time point. For example, in the model predicting fathers' mental health between the ages of

63- and 68-years-old, the indicators of mental health were constrained to be equal for fathers between 57- and 62-years old and fathers between 63- and 68-years-old.

Measurement models.

Before an analysis of the paths between the latent predictors and outcome variables could be completed and each of the proposed hypotheses could be addressed, confirmatory factor analyses (CFA; i.e., measurement models) had to first be completed and analyzed for each hypothesized model to ensure that the relationships between the latent variables and their respective measured variable indicators were properly represented in each of the models. The degree to which the hypothesized models fit the observed data are indicated by three fit indices: the Root Mean Square Error of Approximation (RMSEA), the CFI, and the Standardized Root Mean Square Residual (SRMR). Guidelines for good model fit have been established as less than .06 for the RMSEA, greater than .95 for the CFI, and less than .08 for the SRMR (Hu & Bentler, 1999). Due to the total number of models created, for the sake of clarity, the four CFAs associated with one age group will be presented at a time.

Measurement models for fathers aged 57- to 62-years old with fathers aged 63-to 68-years-old.

Figures 2 through 5 depict the measurement models associated with the latent variables for fathers between the ages 57- and 62-years-old with individual latent variables for fathers between the ages of 63- and 68-years-old. Figure 2 depicts the standardized loadings for the measurement model associated with fathers' mental health, Figure 3 depicts the standardized loadings for the measurement model associated with fathers' physical health, Figure 4 depicts the standardized loadings for the measurement

model associated with fathers' parent-child relationship quality, and Figure 5 depicts the standardized loadings for the measurement model associated with fathers' marital quality.

As shown in each of the figures, each of the measured variables loaded statistically significantly ($p<.05$) onto the respective latent variables. Additionally, as seen in each of the figures, every measurement model demonstrated good model fit (RMSEA<.06, CFI>.95, SRMR<.08). The one exception was seen in the SRMR for the CFA involving fathers' marital relationship quality between the ages of 63- and 68-years-old (SRMR = .087; see Figure 5). However, given the strength of the other two fit indices and the relatively small disparity between the desired SRMR cutoff and the observed SRMR for that model, it was deemed acceptable to move forward with the subsequent structural equation models.
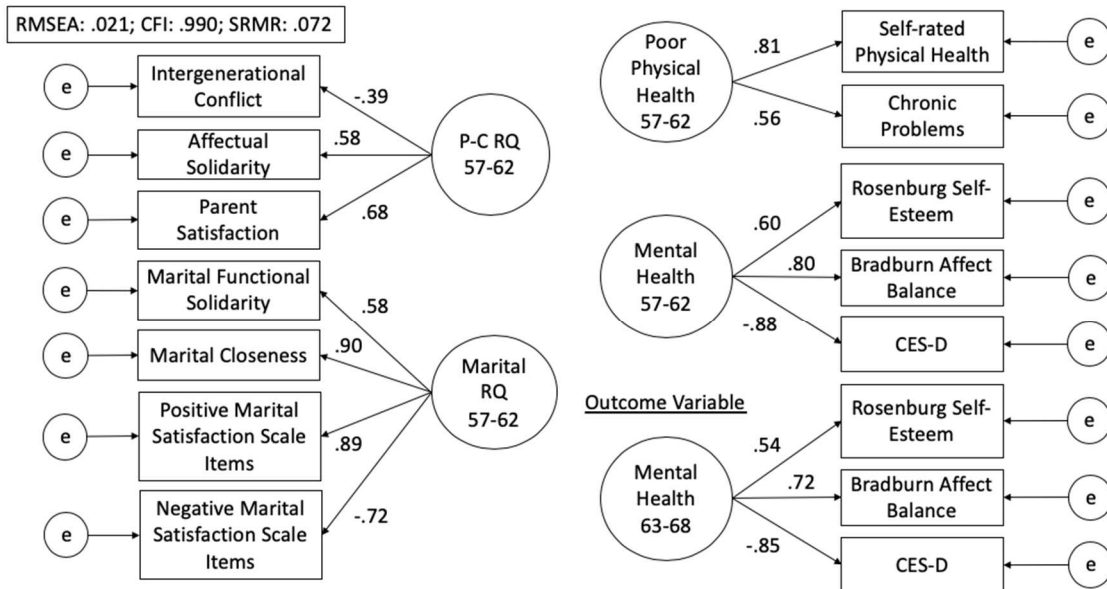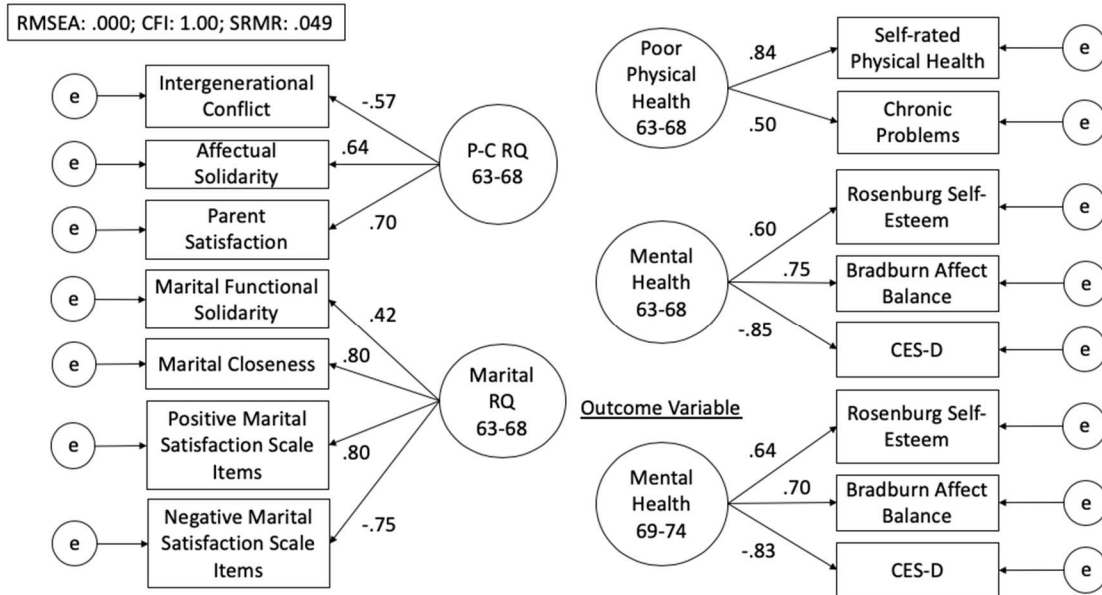

Figure 2. Standardized loadings for the CFA depicting all latent variables for fathers aged 57-62 and mental health for fathers aged 63-68.
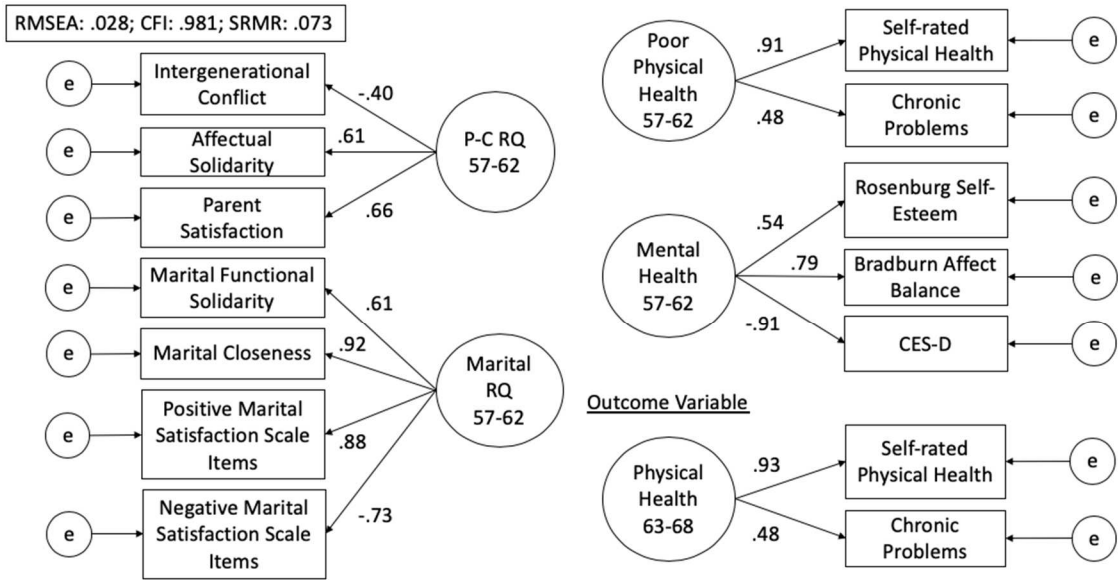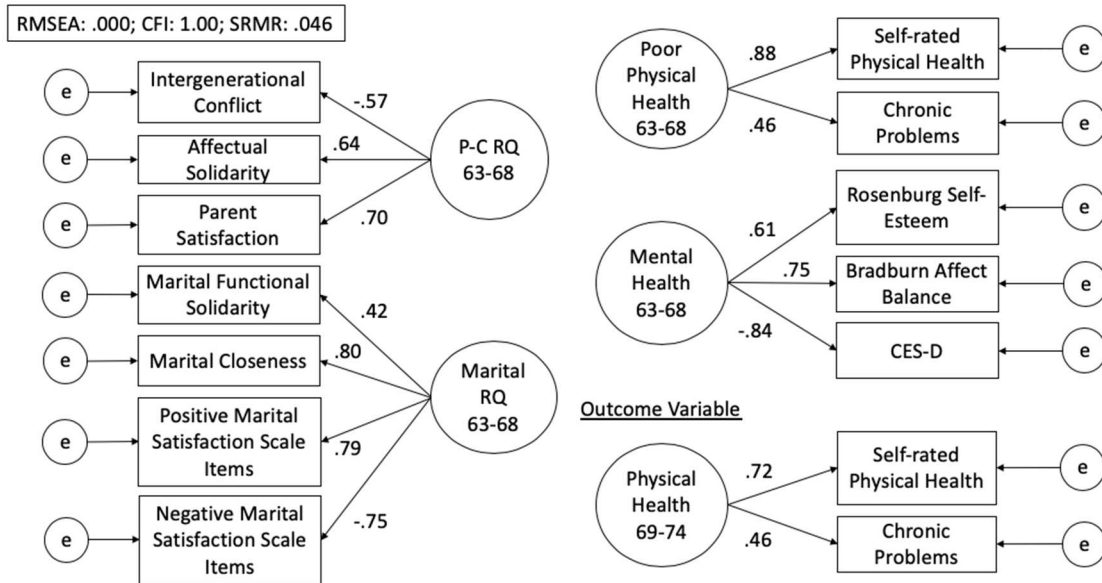
Figure 3. Standardized loadings for the CFA depicting all latent variables for fathers aged 57-62 and physical health for fathers aged 63-68.
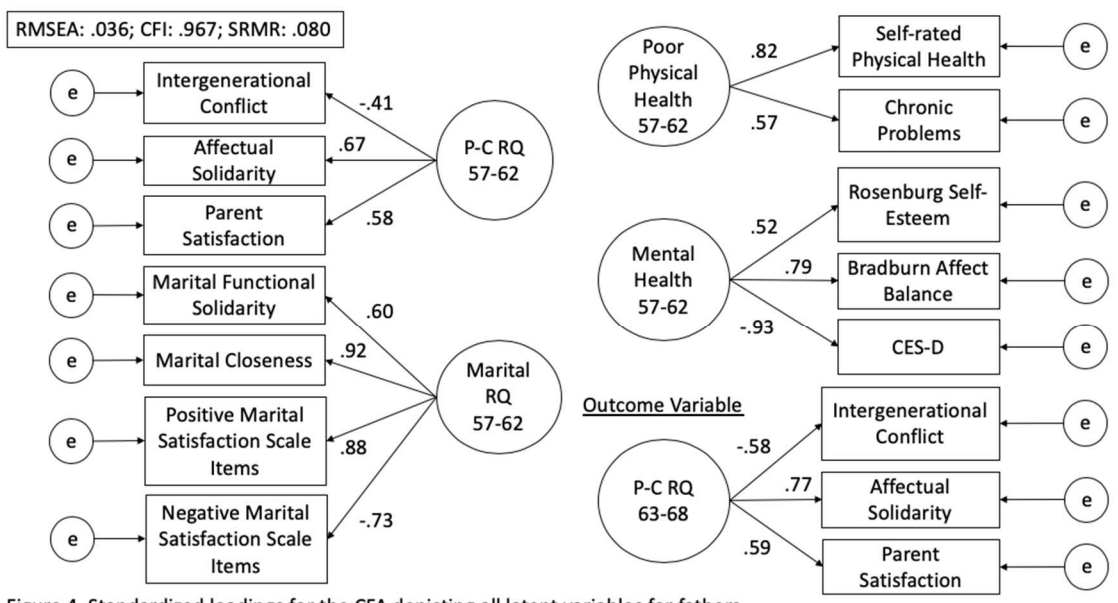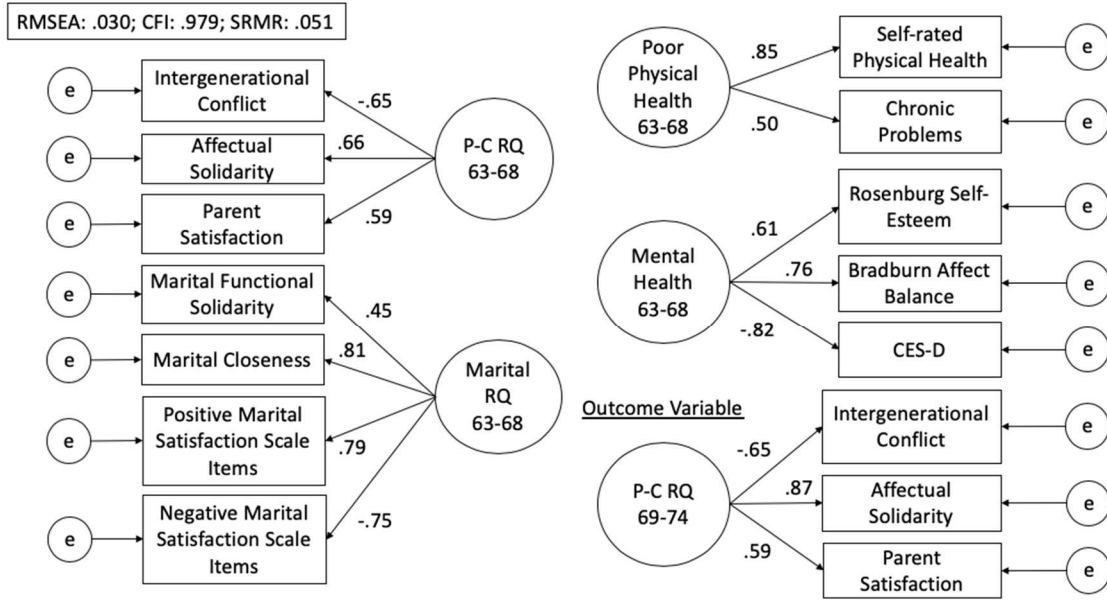

Figure 4. Standardized loadings for the CFA depicting all latent variables for fathers aged 57-62 and parent-child relationship quality for fathers aged 63-68.
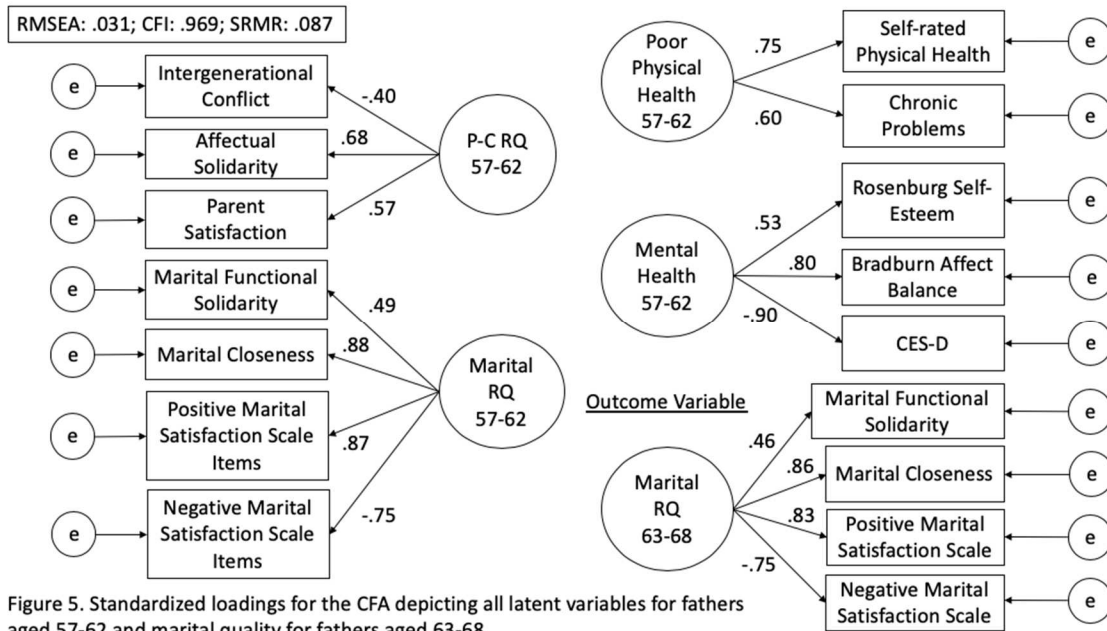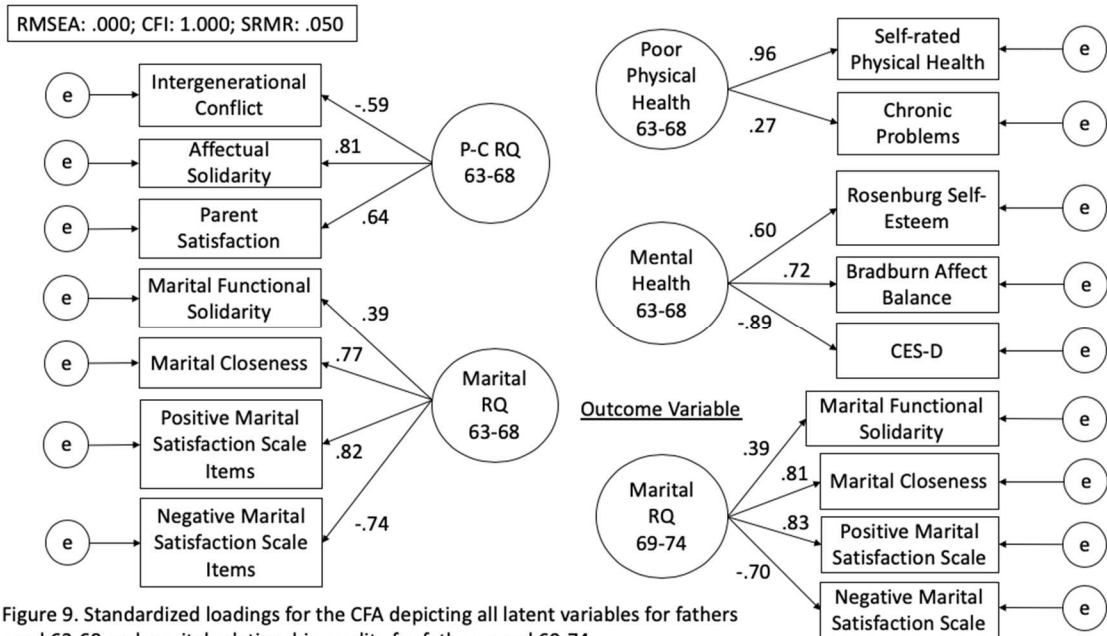
Figure 5. Standardized loadings for the CFA depicting all latent variables for fathers aged 57-62 and marital quality for fathers aged 63-68.

Measurement models for fathers aged 63-to-68-years-old with fathers aged 69-to-74-years-old.

Figures 6 through 9 depict the measurement models associated with the latent variables for fathers between the ages 63- and 68-years-old with individual latent variables for fathers between the ages of 69- and 74-years-old. Figure 6 depicts the standardized loadings for the measurement model associated with fathers' mental health, Figure 7 depicts the standardized loadings for the measurement model associated with fathers' physical health, Figure 8 depicts the standardized loadings for the measurement model associated with fathers' parent-child relationship quality, and Figure 9 depicts the standardized loadings for the measurement model associated with fathers' marital quality.

Each of the measured variables loaded statistically significantly ($p<.05$) onto their respective latent variables. Additionally, as seen in each of the figures, every measurement model demonstrated good model fit (RMSEA<.06, CFI>.95, SRMR<.08). Given these results, it was deemed acceptable to move forward with the subsequent

structural equation models in which the latent variables for fathers aged 69-to-74-years old were predicted by the latent variables for fathers aged 63-to-68-years old.

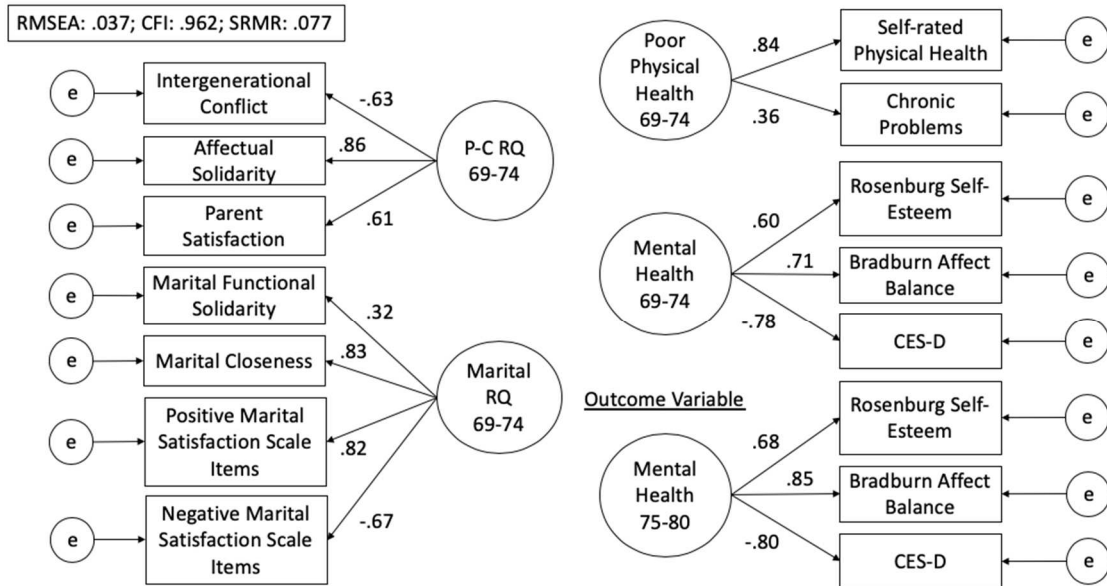
Figure 6. Standardized loadings for the CFA depicting all latent variables for fathers aged 63-68 and mental health for fathers aged 69-74.

Figure 7. Standardized loadings for the CFA depicting all latent variables for fathers aged 63-68 and physical health for fathers aged 69-74.

Figure 8. Standardized loadings for the CFA depicting all latent variables for fathers aged 63-68 and parent-child relationship quality for fathers aged 69-74.

Figure 9. Standardized loadings for the CFA depicting all latent variables for fathers aged 63-68 and marital relationship quality for fathers aged 69-74.

Measurement models for fathers aged 69-to-74-years-old with fathers aged 75-to-80-years-old.

Figures 10 through 13 depict the measurement models associated with the latent variables for fathers between the ages 63- and 68-years-old with individual latent variables for fathers between the ages of 69- and 74-years-old. Figure 10 depicts the

standardized loadings for the measurement model associated with fathers' mental health,

Figure 11 depicts the standardized loadings for the measurement model associated with

fathers' physical health, Figure 12 depicts the standardized loadings for the measurement

model associated with fathers' parent-child relationship quality, and Figure 13 depicts the

standardized loadings for the measurement model associated with fathers' marital quality.

Figure 10. Standardized loadings for the CFA depicting all latent variables for fathers aged 69-74 and mental health for fathers aged 75-80.

Each of the measured variables loaded statistically significantly ($p<.05$) onto their

respective latent variables. Additionally, as seen in each of the figures, every

measurement model demonstrated good model fit (RMSEA<.06, CFI>.95, SRMR<.08).

Given these results, it was deemed acceptable to move forward with the subsequent

structural equation models in which the latent variables for fathers aged 75-to-80-years

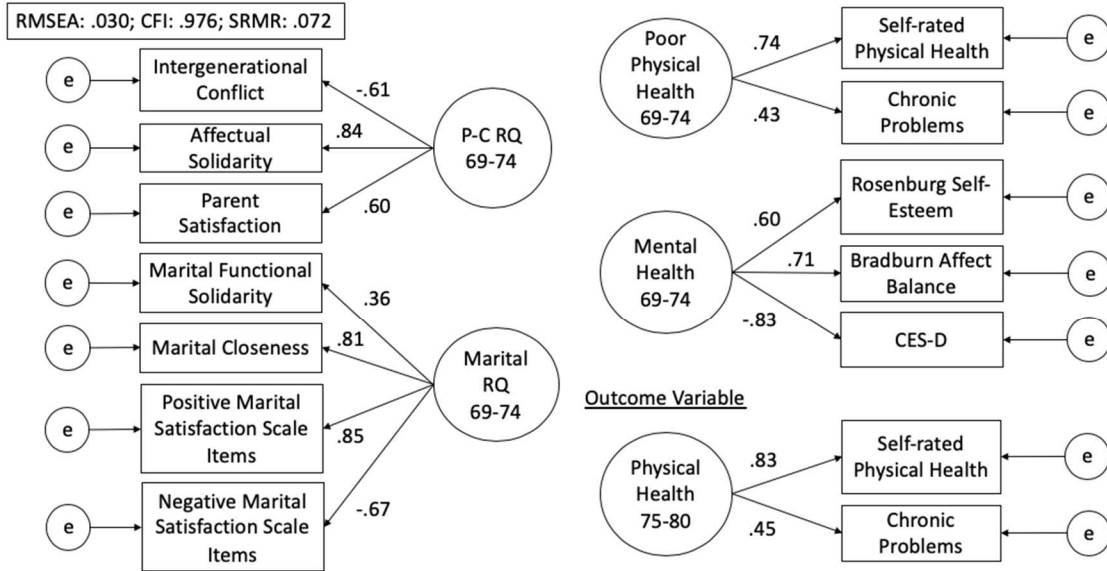old were predicted by the latent variables for fathers aged 69-to-74-years old.

Figure 11. Standardized loadings for the CFA depicting all latent variables for fathers aged 69-74 and physical health for fathers aged 75-80.
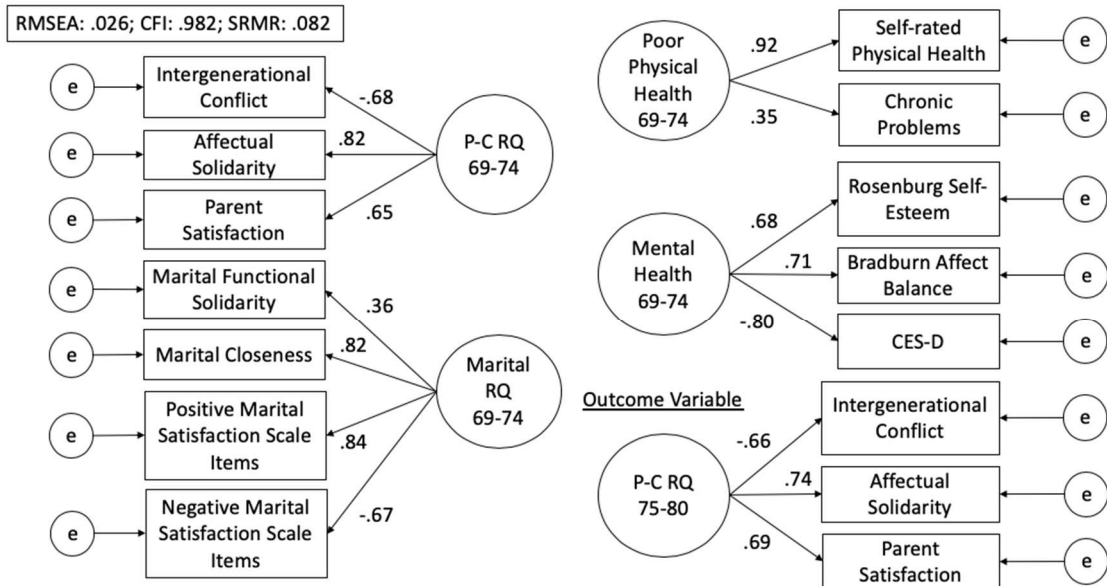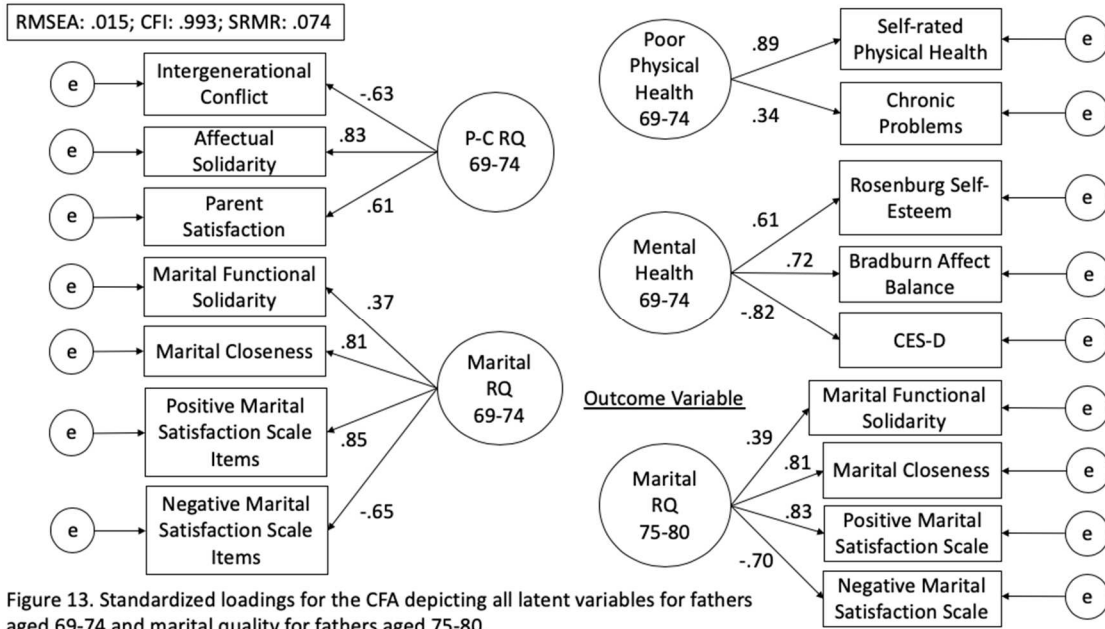

Figure 12. Standardized loadings for the CFA depicting all latent variables for fathers aged 69-74 and parent-child relationship quality for fathers aged 75-80.

Figure 13. Standardized loadings for the CFA depicting all latent variables for fathers aged 69-74 and marital quality for fathers aged 75-80.

Main Analyses

In order to answer the first study research question, 1) What is the nature of the associations among fathers' physical health, mental health, relationship quality with their spouse, and relationship quality with their adult children over time in middle-to-late adulthood?, the following 3 hypotheses were tested.

Hypothesis 1.

In order to answer hypothesis 1, that fathers' physical health, mental health, relationship quality with their adult child, and relationship quality with their spouse will all be positively correlated with one another, the correlations among the exogenous variables in each of the structural equation models were analyzed. As with the measurement models above, the results for each age range are presented individually, prior to providing an overarching summary and conclusion for hypothesis 1.

***Correlations among the latent variables for fathers aged 57-to-62-years-old in
the models predicting outcomes for fathers aged 63-to-68-years-old.***

Figure 14 depicts the statistically significant correlations among each of the

exogenous latent variables in the structural equation models in which fathers' outcomes

between the ages of 63- and 68-years old were predicted by their scores between the ages

of 57- and 62-years-old. In each of these models, the strongest of these relationships was

the negative relationship between fathers' mental health and poor physical health ($r = -$

.60 to -.63). Noting that high scores for poor physical health were indicative of worse

physical health, this negative relationship between poor physical health and mental health

indicates that better mental health was associated with lower reports of poor physical

health (i.e., better physical health).

Following the association between mental health and physical health, the next

most powerful correlation was between fathers' marital quality and their own mental

health ($r = .54$ to .58), indicating that fathers who were in better mental health generally

also had higher levels of marital quality.

For fathers between the ages of 57- and 62-years old, the correlation between their

relationship quality with their child and marital relationship quality was the next strongest

relationship ($r = .42$ to .48), suggesting that fathers who have positive relationships with

their focal child also tended to have more positive relationships with their spouse.

Finally, the correlation between fathers' relationship quality with their focal child

and their own mental health ($r = .39$ to .46) was nearly identical in strength to the

correlation between fathers' poor physical health and their marital relationship quality (r

$= -.38$ to -.41). The first of these two correlations suggests that fathers who are in better

mental health also tend to have better relationships with their children. On the other hand, the negative relationship between poor physical health and marital relationship quality suggests that fathers who are in poorer physical health generally have worse relationships with their spouse.

For fathers between the ages of 57- and 62-years-old, only the correlation between fathers' physical health and their relationship quality with their focal child was not significant, suggesting that for this age group of fathers, their relationship quality with their child either is not associated with their own physical health or the association is too weak too detect.
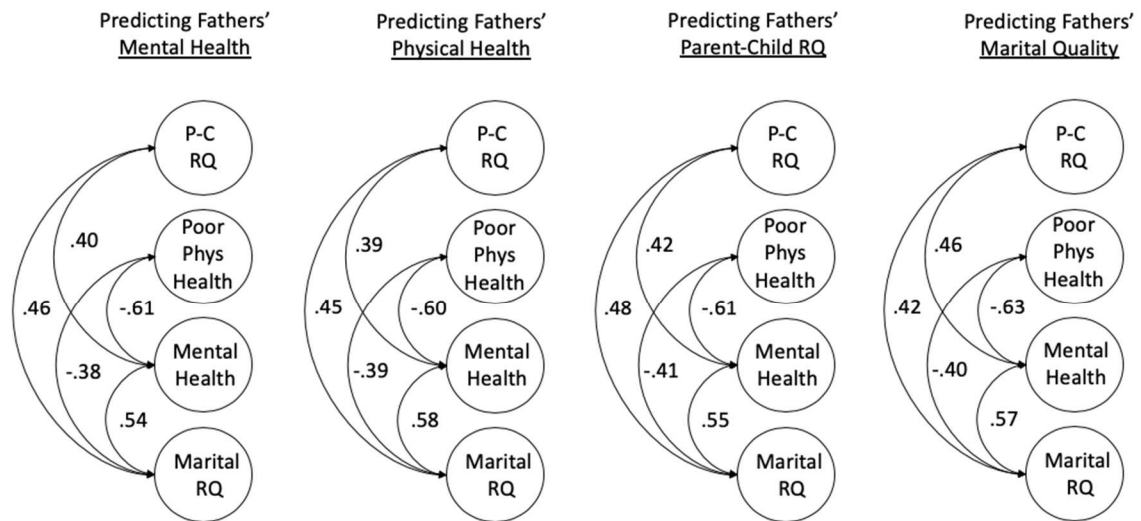
Figure 14. Statistically significant (*p*<.05) correlations among exogenous variables for fathers aged 57-to-62-years-old predicting the outcomes for fathers aged 63-to-68-years-old (n = 282).

To summarize, for fathers between the ages of 57-years-old and 62-years-old, each of the associations among the latent variables was statistically significant, with the exception of the association between fathers' physical health and their relationship quality with their children. The relative strengths of the statistically significant associations are ordered as follows: Between 1) fathers' physical health and mental health, 2) fathers' mental health and marital quality, 3) fathers' relationship quality with

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their spouse and relationship quality with their child, 4) fathers' mental health and their relationship quality with their child, and 5) fathers' physical health and marital relationship quality.

Correlations among the latent variables for fathers aged 63-to-68-years-old in the models predicting outcomes for fathers aged 69-to-74-years-old.

Figure 15 depicts the statistically significant correlations among each of the exogenous latent variables in the structural equation models in which fathers' outcomes between the ages of 69- and 74-years old were predicted by their scores between the ages of 63- and 68-years-old. In each of these models, the association between the fathers' mental health and their relationship quality with their focal child was the strongest of the associations among the latent predictors ($r = .46$ to .49), followed by the association between fathers' mental health and their marital relationship quality ($r = .40$ to .43). These associations indicate that fathers who are in better mental health generally experience better relationships with their focal child and their spouse.

The next most powerful association among latent predictor variables within this age group was between fathers' poor physical health and their mental health ($r = -.38$ to -.41), indicating that fathers who report lower scores of poor physical health (i.e., are in better health) tend to experience better mental health as well.

There were two trend-level associations ($p<.10$) for fathers within this age range: 1) between their relationship quality with their focal child and their marital quality ($r = .20$ to .21) and 2) between their relationship quality with their focal child and their own poor physical health ($r = -.16$ and -.18). The first of these two trend-level associations indicates the possibility that fathers who have more positive relationships with their children might also have more positive relationships with their spouse. The second

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association indicates that fathers in poorer physical health might experience worse relationships with their focal child.

For fathers between the ages of 63-years-old and 68-years-old, the correlation between their marital quality and poor physical health was no longer significant, indicating that fathers' marital quality and fathers' physical health are not statistically associated in this age group.
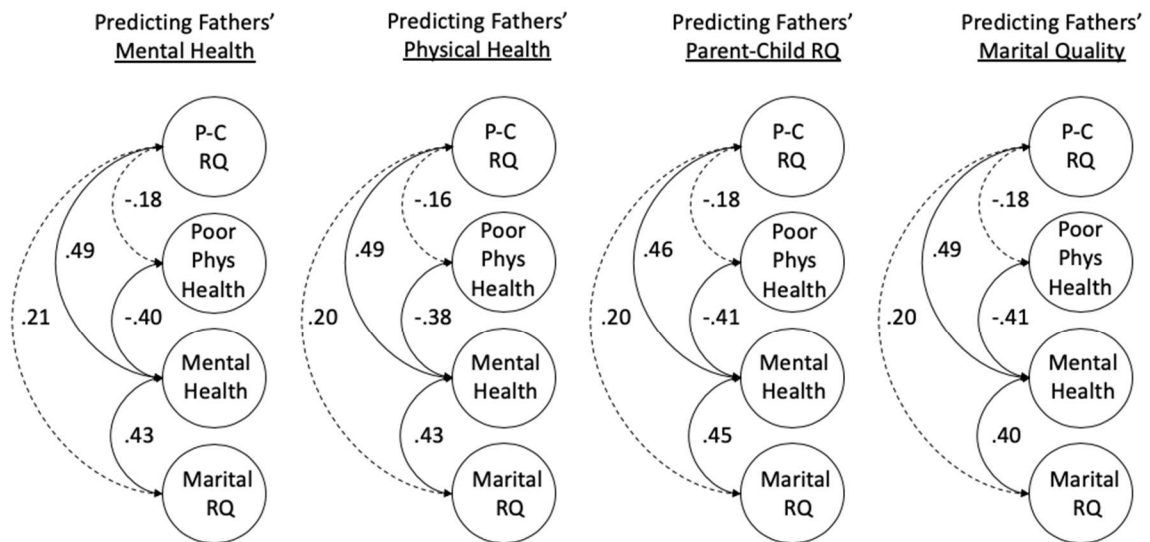

Figure 15. Statistically significant (p<.05) correlations among exogenous variables for fathers aged 63-to-68-years-old in each of the models predicting the outcomes for fathers aged 69-to-74-years-old (n = 282). Dashed lines indicate trend-level significance (p<.10).

To summarize, for fathers between the ages of 63-years-old and 68-years-old, the association between father-child relationship quality and fathers' mental health was the most powerful, followed by fathers' mental health and marital relationship quality, followed by fathers' physical and mental health. The associations between 1) father-child relationship quality and fathers' marital quality and 2) father-child relationship quality and fathers' physical health were only significant at the trend-level ($p<.10$), whereas the association between fathers' physical health and their marital relationship quality was not significant.

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Correlations among the latent variables for fathers aged 69-to-74-years-old in the models predicting outcomes for fathers aged 75-to-80-years-old.

Figure 16 shows the statistically significant correlations among each of the exogenous latent variables in the structural equation models in which fathers' intra- and interpersonal characteristics between the ages of 69- and 74-years old predicted their outcomes between the ages of 75- and 80-years-old.

As in the first age group (fathers between the ages of 57-years-old and 62-years-old), the strongest correlation was again seen between fathers' mental health and poor physical health (r = -.66 to -.75), indicating that fathers in poor physical health also showed poorer mental health than their healthier counterparts.

The trend from the previous age groups also continued in the correlation between fathers' marital quality and their own mental health (r = .52 to .57), indicating that, for fathers between the ages of 69- and 74-years-old, fathers who were in better mental health generally also had higher levels of marital quality.

The correlations between fathers' relationship quality with their child and their own marital relationship quality was, again, the third strongest relationship (r = .29 to .32), suggesting that fathers who have positive relationships with their focal child also have more positive relationships with their spouse.

Finally, the correlations between fathers' relationship quality with their focal child and their own mental health (r = .26 to .27) and the correlations between their poor physical health and their marital relationship quality (r = -.23 to -.31) were nearly identical, suggesting that fathers who are in better mental health generally also have better relationships with their children and fathers who are in poorer physical health tend to have worse relationships with their spouse.

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The correlation between fathers' physical health and their relationship quality with their focal child was, once again, not significant, suggesting that, for fathers between the ages of 69-years-old and 74-years-old, their relationship quality with their child is independent of their own physical health.
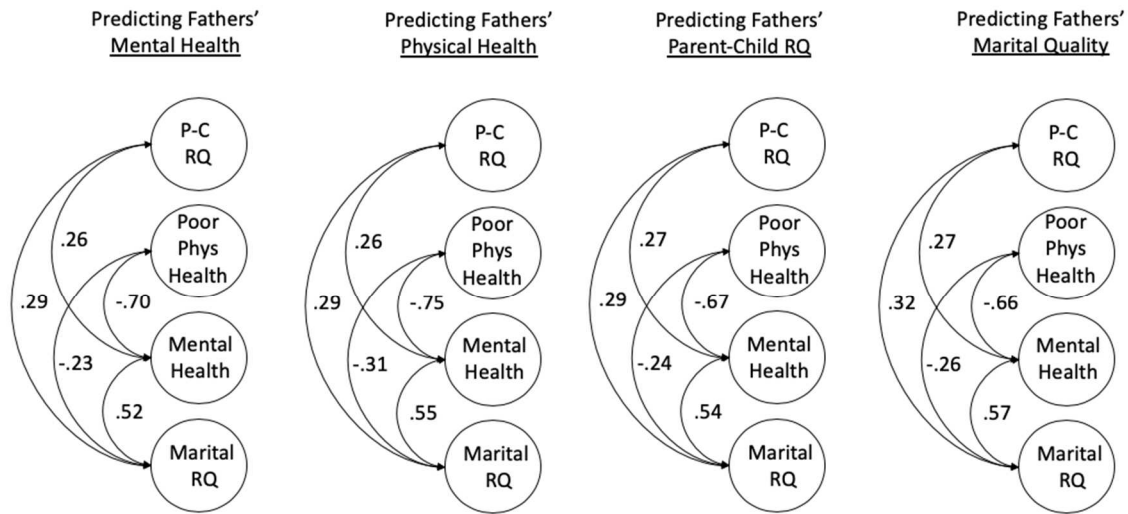

Figure 16. Statistically significant (*p*<.05) correlations among exogenous variables for fathers aged 69-to-74-years-old in each of the models predicting the outcomes for fathers aged 75-to-80-years-old (n = 186).

To summarize, for 69-to-74-year-old fathers, all of the associations among the latent variables were statistically significant, with the exception of the association between fathers' physical health and their relationship quality with their child. From strongest to weakest, the order of the strength of associations were 1) between fathers' mental and physical health, 2) between fathers' mental health and marital relationship quality, 3) between fathers' marital relationship quality and relationship quality with their child, 4) between fathers' mental health and relationship quality with their child, and 5) between fathers' physical health and marital relationship quality.

Summary of results for hypothesis 1.

Among all age groups, the following associations remained statistically significant: 1) between fathers' mental health and poor physical health, 2) between

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fathers' mental health and marital relationship quality, and 3) between fathers' mental health and parent-child relationship quality. For the fathers in the first and third age groups (ages 57-to-62-years-old and 69-to-74-years-old), the strongest association was between fathers' physical health and mental health, followed by the association between fathers' mental health and marital relationship quality. For fathers in the second age group (ages 63-years-old to 68-years-old), the strongest association was between fathers' mental health and their relationship quality with their child, followed by the association between their mental health and marital relationship quality. The weakest of the associations among the four predictor variables appears to be between fathers' physical health and relationship quality with their focal child. In the first and third age groups (ages 57-to-62-years-old and 69-to-74-years-old), this association between fathers' physical health and relationship quality with their focal child was not statistically significant, and it was only significant at the trend level for fathers between the ages of 63-years-old and 68-years-old, indicating that fathers' relationship quality with their focal child is fairly independent from fathers' own physical health.

The statistical significance of the associations among fathers' physical health and marital relationship quality and their marital relationship quality and parent-child relationship quality varied across time. For the first and third age groups (ages 57-to-62-years-old and 69-to-74-years-old), these associations were statistically significant. However, for fathers in the second age group (63-years-old to 68-years-old), the association between their marital relationship quality and parent-child relationship quality was reduced to a trend-level association, while the association between their marital quality and physical health was no longer statistically significant.

Overall, the number and magnitude of associations among the latent variables across all age groups provides general support for the first hypothesis, that fathers' physical health, mental health, relationship quality with their spouse, and relationship quality with their focal child are related.

Hypothesis 2.

In order to evaluate the second hypothesis, that fathers' physical health, mental health, relationship quality with their adult child and relationship quality with their spouse are significant predictors of each other across all of the fathers' age ranges analyzed, the autoregressive and cross-lagged path coefficients in each structural equation model were evaluated. For each age range, four separate structural equation models were completed—one for each latent outcome variable (i.e., fathers' mental health, physical health, parent-child relationship quality, and marital relationship quality). The results for each age range are presented individually, prior to providing an overarching summary and conclusion for hypothesis 2.

Predicting 63-to-68-year-old fathers' outcomes.

Figure 17 depicts a summary of the statistically significant ($p<.05$) standardized path coefficients for the four structural equation models in which outcomes for fathers between the ages of 63-years-old and 68-years-old were predicted by each of the four latent variables from the time the fathers were between the ages of 57-years-old and 62-years-old. For the sake of visual simplicity, the figures depicting the structural equation models (Figures 17, 18, and 19) only show the time-invariant covariates and the time-variant covariates associated with the second age group of fathers (e.g., "Income" for

fathers aged 63-to-68-years-old in Figure 17) in each model. In the analyses, time-variant

covariates associated with fathers in the first age group of each model (e.g., fathers aged

57-to-62-years-old in Figure 17) were also included as control variables for the earlier

age group and were allowed to covary with the covariates from the latter age group.
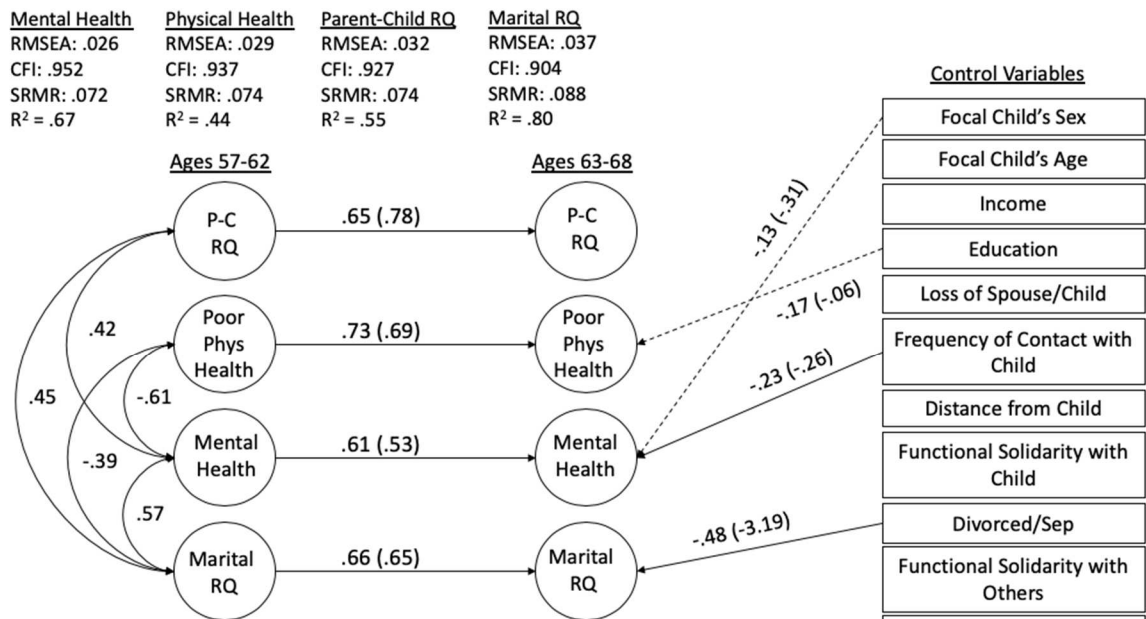

Figure 17. Structural model summary showing standardized path coefficients (unstandardized in parentheses) of significant predictors of fathers' outcomes from ages 63-68. Solid lines: $p<.05$; Dashed lines: $p<.10$ (n = 282).

A review of the goodness of fit indices, displayed across the top-left corner of

Figure 16, indicate relatively good fit between the model and the data across all four

models, indicating that each hypothesized structural model fit the observed relationships

among the measured variables in an acceptable way.

As shown in Figure 17, the autoregressive paths in each of the four models were

the only statistically significant paths between the exogenous and endogenous latent

variables. Thus, for fathers between the ages of 63- and 68-years-old, the most powerful

predictor of their parent-child relationship quality was their parent-child relationship

quality from ages 57-years-old to 62-years-old ($ß=.65$), the most powerful predictor of

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their physical health was their physical health six years earlier ($ß=.73$), the most powerful predictor of their mental health was their mental health six years prior ($ß=.61$), and the most powerful predictor of their marital relationship quality was their marital quality six years earlier ($ß=.66$), controlling for each of the 11 covariates. These results indicate that, controlling for the autoregressive paths, the cross-lagged paths do not add statistically significant predictive ability to the outcome variables. In other words, for example, knowing information about fathers' mental health, their relationship quality with their child, and their relationship quality with their spouse does not help to predict their physical health six years later above and beyond simply knowing about their physical health during the same time frame.

Regarding the covariates, the fathers' frequency of contact with his focal child was a significant predictor of his mental health ($ß=-.23$). The negative association between fathers' frequency of contact with his focal child and his own mental health indicates that fathers who had more contact with their focal child were in worse mental health. Unsurprisingly, fathers who experienced divorce or separation also reported lower marital quality ($ß=-.48$).

At the trend level ($p<.10$), having more education was predictive of lower reports of poor physical health ($ß=-.17$) and fathers with daughters reported lower mental health than fathers with sons ($ß=-.13$).

The final models accounted for 67% of the variance in fathers' mental health, 44% of the variance in fathers' physical health, 55% of the variance in fathers' relationship quality with their focal child, and 80% of the variance in fathers' marital relationship quality between the ages of 63- and 68-years-old.

In sum, for fathers between the ages of 63-years-old and 68-years-old, the only statistically significant paths between the latent variables were the autoregressive paths. Regarding covariates, fathers' mental health was predicted by the frequency of contact with their focal child and, at the trend level, the focal child's sex; fathers' physical health was predicted, at the trend level, by their level of education; and, as expected, divorce was predictive of lower marital quality.

Predicting 69-to-74-year-old fathers' outcomes.

Figure 18 depicts a summary of the statistically significant (*p<*.05) standardized path coefficients for the four structural equation models in which outcomes for fathers between the ages of 69-years-old and 74-years-old were predicted by each of the four latent variables from the time the fathers were between the ages of 63-years-old and 68-years-old.
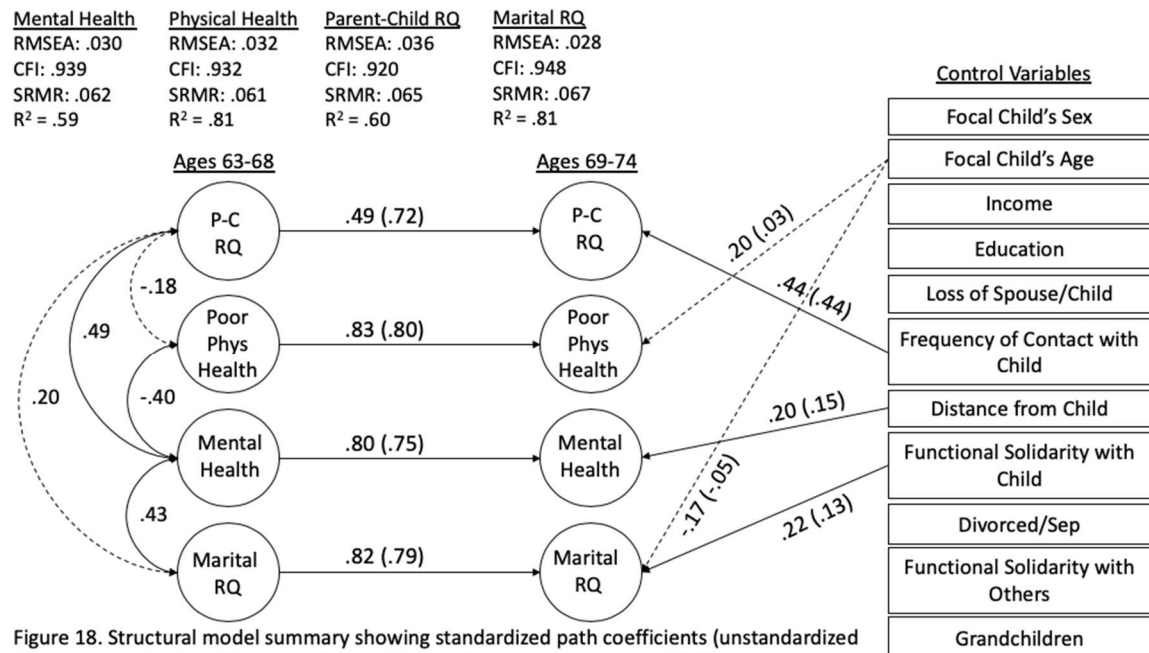
Figure 18. Structural model summary showing standardized path coefficients (unstandardized in parentheses) of significant predictors of fathers' outcomes from ages 69-74.
Solid lines: *p<*.05; Dashed lines: *p<*.10 (n = 306).

The goodness of fit indices, seen across the top left corner of Figure 18, suggest overall good fit between each of the four models and the data.

As was the case for the previous age group, the autoregressive paths were the only statistically significant paths between the exogenous and endogenous latent variables for fathers between the ages of 69- and 74-years-old. Controlling for the covariates, fathers' mental health from ages 63-to-68-years-old was the only statistically significant predictor of their mental health from ages 69-to-74-years-old (β = .80), their physical health from ages 63-to-68-years-old was the only statistically significant predictor of their physical health between the ages of 69-to-74-years-old (β = .83), their parent-child relationship quality was the only statistically significant predictor of their parent-child relationship quality six years later (β = .49), and their marital relationship quality was the only statistically significant predictor of their marital relationship quality six years later (β = .82). These results indicate that, for the 69-to-74-year-old fathers, the cross-lagged paths do not offer statistically significant predictive power beyond that which is offered through the autoregressive paths.

Regarding the covariates, the focal child's age was predictive, at the trend level, of fathers' poor physical health (β=.20) and marital quality (β=-.17), indicating that fathers with older children reported poorer physical health and lower marital relationship quality. Additionally, fathers' functional solidarity with the focal child (the amount of emotional and instrumental support received from the child) was predictive of marital quality (β=.22), indicating that fathers who received more support from their focal child reported higher levels of marital quality. Fathers who had more frequent contact with their focal child also reported greater parent-child relationship quality (β=.44). Finally,

the geographic distance between fathers' and focal children's residences was predictive of fathers' mental health (β=.20), such that fathers' mental health increased as the geographic distance to the focal child's residence increased.

For fathers between the ages of 69- and 74-years-old, the final models accounted for 59% of the variance in their mental health, 81% of the variance in their physical health, 60% of the variance in their relationship quality with their focal child, and 81% of the variance in their marital relationship quality.

In conclusion, for fathers between the ages of 69-years-old and 74-years-old, the autoregressive paths were, again, the only statistically significant paths between the latent variables. Fathers with older children showed, at the trend level, poorer physical health and worse marital quality, whereas fathers who received more functional support from their children showed higher marital quality. Fathers who had more frequent contact with their child reported higher levels of relationship quality with that child, but fathers who lived farther away from their focal child reported higher levels of mental health.

Predicting 75-to-80-year-old fathers' outcomes.

Due to an increased amount and inconsistent patterns of missing data among the age group from 75-years-old to 80-years-old, the control variables that were able to be included in each model were not the same across all four models for this age group. All four models included the focal child's sex and age, fathers' income and education, functional solidarity with others (i.e., the level of non-familial instrumental and emotional support fathers received), and grandparental status as covariates. The models predicting fathers' physical health and fathers' marital relationship quality did not include any other covariates. The model predicting mental health included all covariates except for, "loss of

a spouse or child," and, "distance from the focal child." The model predicting parent-child relationship quality included all covariates except for "frequency of contact with the focal child," "functional solidarity with the focal child," and, "distance from the focal child."

Figure 19 depicts a summary of the statistically significant ($p<.05$) standardized path coefficients for the four structural equation models in which outcomes for fathers between the ages of 75-years-old and 80-years-old were predicted by each of the four latent variables from the time the fathers were between the ages of 69-years-old and 74-years-old.
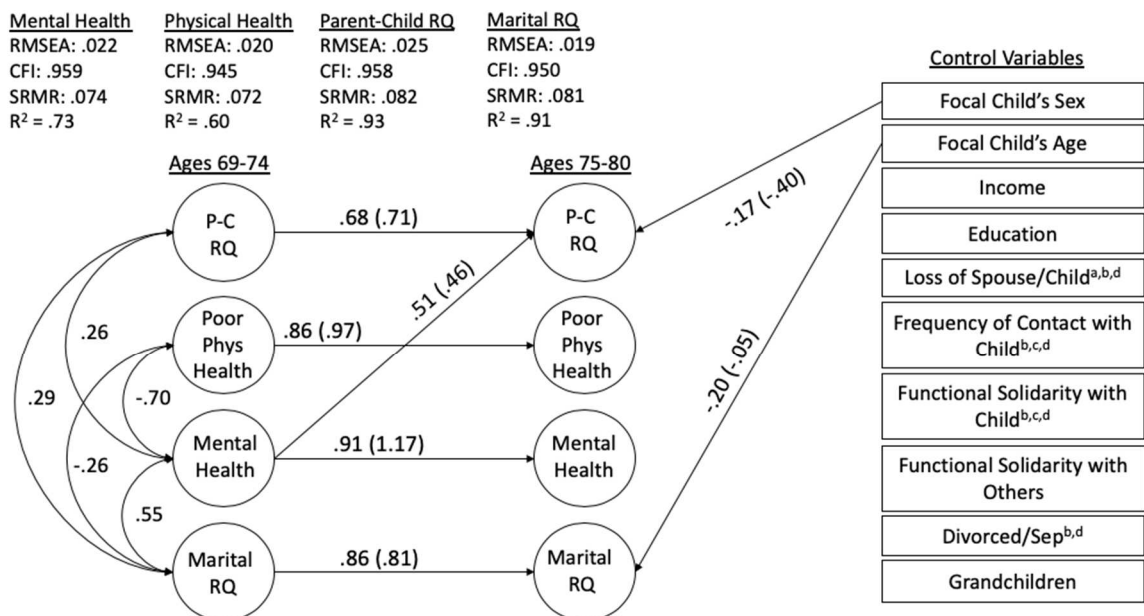
Figure 19. Structural model summary showing standardized path coefficients (unstandardized in parentheses) of significant predictors of fathers' outcomes from ages 75-80. Solid lines: $p<.05$; Dashed lines: $p<.10$ (n = 160). [a]Not included in mental health model. [b]Not included in physical health model. [c]Not included in P-C RQ model. [d]Not included in marital RQ model.

The goodness of fit indices, seen across the top left corner of Figure 19, indicate good fit between each of the four structural models and the data.

Similar to the previous two age groups, with one exception, the autoregressive paths were the only paths that were statistically significant between the latent predictors and outcome variables for fathers between the ages of 75- and 80-years-old. Fathers'

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mental health for the group of fathers between the ages of 75- and 80-years-old was predicted by their mental health from six years earlier (β = .91), their physical health between the ages of 75- and 80-years old was predicted by their physical health between from six years earlier (β = .86), their parent-child relationship quality was predicted by their parent-child relationship quality six years earlier (β = .68), and their marital relationship quality was predicted by their marital relationship quality six years earlier (β = .86). However, for fathers in this age group, there was also a statistically significant path between their parent-child relationship quality and their mental health, indicating that better mental health between the ages of 69- and 74-years-old was predictive of better relationship quality with their focal child six years later.

Regarding the covariates, fathers of daughters tended to report lower parent-child relationship quality than fathers of sons (β=-.17). Additionally, fathers' marital quality was predicted by the focal child's age (β=-.20), indicating that fathers marital quality tended to decline as their children aged.

The final models accounted for 73% of the variance in fathers' mental health, 60% of the variance in fathers' physical health, 93% of the variance in parent-child relationship quality, and 91% of the variance in fathers' marital relationship quality for fathers between the ages of 75- and 80-years-old.

In sum, for fathers between the ages of 75-years-old and 80-years-old, each of the autoregressive paths between the latent variables was significant. However, for fathers in this age group, father-child relationship quality was also statistically significantly predicted by their mental health from six years earlier.

Regarding the covariates, fathers with daughters reported lower father-child relationship quality and, as was the case for the group of fathers between the ages of 69-years-old and 74-years-old, having older children was predictive of lower marital quality.

Summary of results for hypothesis 2.

Across the age groups (63-to-68-years old, 69-to-74-years old, and 75-to-80-years-old) of fathers studied, two characteristics related to hypothesis 2 (that fathers' physical health, mental health, relationship quality with their adult child and relationship quality with their spouse will all be significant predictors of each other across all of the fathers' age ranges analyzed) seem apparent: First, the autoregressive paths dominated the predictive power of the exogenous latent variables. In fact, across all twelve structural models, only one cross-lagged path was statistically significant. Therefore, it appears that the cross-lagged effects do not provide statistically significant predictive power above that which is provided by the autoregressive paths, contrary to the suggestion in hypothesis 2.

Second, the predictive patterns across all models seems to show a high level of consistency and stability within the autoregressive paths. With the exception of a slight decrease in the autoregressive standardized path coefficient for parent-child relationship quality from the first age group being predicted (ages 63-to-68-years-old) to the second (ages 69-to-74-years-old), the predictive patterns exhibited between the exogenous and endogenous latent variables were similar across age groups. Additionally, with the exception of the path involving fathers' parent-child relationship quality mentioned above, all of the autoregressive paths showed an upward trend in predictive strength across time. Therefore, the results of this study do not support the second hypothesis.

Hypothesis 3.

Hypothesis 3 stated that fathers' relationship quality with their spouse would be a more powerful predictor than their relationship quality with their adult child of their own physical and mental health over time. The evaluation of this hypothesis could be achieved by examining the standardized path coefficients between the predictor and outcome latent variables. However, the lack of statistically significant cross-lagged effects across all models and age groups, seen in Figures 17, 18, and 19, indicates that neither parent-child relationship quality nor marital quality was a significant predictor of fathers' physical or mental health across time. In fact, the one cross-lagged effect that did appear was from fathers' mental health to his parent-child relationship quality six years later, indicating that fathers' mental health is a more powerful predictor of their relationship quality with their children than vice versa.

Although neither type of relationship quality was predictive of fathers' physical or mental health across time, some support for the hypothesis that the association between fathers' marital relationship quality and their physical and mental health is more powerful than the association between their relationship quality with their child and their physical and mental health can be seen in the within-time associations among the latent variables. For fathers aged 57-to-62-years old and fathers aged 69-to-74-years-old, the association between marital quality and fathers' mental health (r=.57 and r=.55 for each age respective group) was more powerful than the association between fathers' relationship quality with their child and their own mental health (r=.42 and r=.26, for each age group, respectively).

The relative strength of association is somewhat less clear in the 63-to-68-year-old age group. Within this age range, fathers' relationship quality with their child was slightly more powerful than their marital relationship quality in their respective associations with fathers' mental health (r=.49 and .43, respectively). However, the magnitude of the difference is smaller than the magnitude of difference between associations exhibited in the other age groups.

Additionally, within the 63-to-68-year-old age range, the association between fathers' parent-child relationship quality and their physical health appears to be stronger than the association between their marital quality and physical health (which was not statistically significant). However, the relatively low magnitude of this association (r=-.16) and the trend-level significance of the association gives rise to some caution in interpreting these results.

Given these results, it appears that neither parent-child relationship quality, nor marital relationship quality, is a statistically significant predictor of fathers' physical and mental health outcomes over time. Thus, the results do not support hypothesis 3.

Although there is some evidence that marital quality is more powerfully associated than father-child relationship quality with fathers' mental and physical health within age groups, the change in the strength of the associations seen within the 63-to-68-year-old fathers suggests that the relative strength of the within-time associations among these variables may change nonlinearly as fathers age.

In order to answer the second research question: 2) How does the nature of these relationships change as fathers age in middle-to-late adulthood?, the following hypothesis was tested.

Hypothesis 4.

Hypothesis 4 stated: As fathers in middle-to-late adulthood age, the parent-child relationship will be a more powerful predictor of fathers' mental and physical health for older fathers than for the fathers in the younger age groups. Further, the relative strength of influence from fathers' spouse and children on fathers' own mental and physical health will increase over time. The answer to hypothesis 4 could be obtained through an evaluation of the change in standardized path coefficients from the respective type of relationship quality to fathers' mental and physical health for each age group. However, due to the limitations of the dataset, the creation of a single structural model across all age groups could not be accomplished. Therefore, a statistical analysis comparing the relative strength of standardized path coefficients across time could not be conducted. However, given the absence of cross-lagged effects from both types of relationship quality to fathers' physical and mental health outcomes across all models and age groups (see figures 17, 18, and 19), it appears that the results do not support this hypothesis; rather than showing an increase in influential power from fathers' relationship quality on their physical and mental health across time, these results, instead, indicate an absence of such effects across all age groups, controlling for the autoregressive paths and covariates.

Summary of results.

This study sought to answer the following two research questions: 1) What is the nature of the relationships among fathers' physical health, mental health, relationship quality with their spouse, and relationship quality with their adult children over time in middle-to-late adulthood? and 2) How does the nature of these relationships change as fathers age in middle-to-late adulthood? Table 3, at the end of this chapter, provides a

summary of the four hypotheses tested to answer these two research questions, along with the associated results.

To answer the first research question, three hypotheses were tested. The first hypothesis stated that fathers' physical health, mental health, relationship quality with their adult child, and relationship quality with their spouse would all be positively correlated with one another. The results of this study largely supported this hypothesis. With the exception of the association between fathers' physical health and relationship quality with his child, each of the other latent variables showed consistent positive associations with one another.

Hypothesis 2 stated that fathers' physical health, mental health, relationship quality with their adult child and relationship quality with their spouse would all be significant predictors of each other across all of the fathers' age ranges analyzed. The results of this study did not support this hypothesis. With the exception of one cross-lagged effect from fathers' mental health between the ages of 69- and 74-years-old to fathers' relationship quality with their child 6 years later, the only statistically significant effects across all age groups were seen in the autoregressive paths.

The third hypothesis stated that fathers' relationship quality with their spouse would be a more powerful predictor than their relationship quality with their adult children of their own physical and mental health over time. Again, the lack of cross-lagged effects across all age groups suggests that neither type of relationship quality is a statistically significant predictor of fathers' physical or mental health. Thus, hypothesis 3 is not supported by the results of this study.

To answer research question 2, which asked how the nature of these relationships change as fathers age in middle-to-late adulthood, the following hypothesis was tested: The relative influence of the father-child relationship quality and the marital relationship quality on fathers' own mental and physical health would increase over time. As fathers' aged, there were no cross-lagged effects from either type of fathers' relationship quality to their own mental and physical health. Therefore, the results do not support hypothesis 4.

In sum, it appears that, although there are multiple within-time associations among each of the latent variables, the most powerful predictor—indeed, the only statistically significant predictor—of each variable across time is the measure of itself in the previous age group. Thus, hypothesis 1 is supported, but the other three hypotheses are not supported.

Table 3
Hypotheses and Associated Results

Hypothesis	Results
1) Fathers' physical health, mental health, relationship quality with their adult child, and relationship quality with their spouse will all be positively correlated with one another.	The number and magnitude of associations among the latent variables across all age groups provides general support for this hypothesis. The one exception was between fathers' physical health and their relationship quality with their child, which appeared to be independent from one another, or have a weak correlation, at most.
2) Fathers' physical health, mental health, relationship quality with their adult child and relationship quality with their spouse will all be significant predictors of each other across all of the fathers' age ranges analyzed. Thus, bidirectional relationships will be manifest among each of these areas	The results indicate that the cross-lagged effects do not provide statistically significant predictive power above that which is provided by the autoregressive paths. Therefore, hypothesis 2 is not supported by the results of this study.

of fathers' lives.

3) Fathers' relationship quality with their spouse will be a more powerful predictor than their relationship quality with their adult child of their own physical and mental health over time.	Although within-time correlations provide some support for the premise of this hypothesis, it appears that neither parent-child relationship quality, nor marital relationship quality, is a statistically significant predictor of fathers' physical and mental health outcomes over time. Thus, the results do not support hypothesis 3.
4) As fathers in middle-to-late adulthood age, the parent-child relationship will be a more powerful predictor of fathers' mental and physical health for older fathers than for the fathers in the younger age groups. Further, the relative strength of influence from fathers' spouse and children on fathers' own mental and physical health will increase over time.	The results do not support hypothesis 4. Rather, they indicate an absence of effects from both types of relationship quality on fathers' mental and physical health across all age groups, controlling for the autoregressive paths and covariates.

Chapter 5: Discussion

The purpose of this study was twofold: 1) To examine the nature of the relationships among fathers' physical health, mental health, relationship quality with their spouse, and relationship quality with their adult children over time in middle-to-late adulthood, and 2) to examine how the nature of these relationships change as fathers age in middle-to-late adulthood. To address these questions, data were used from a sample of 588 fathers who had at least one child over the age of 19-years-old and who had participated in the Longitudinal Study of Generations (LSOG) between 1988 and 2000. Prior to discussing the answers to the study's research questions, it should be noted that the sample used for the present study represented White, relatively well-educated individuals from mostly intact families. Studies suggest that racial minorities experience the influence of adult children on parents' well-being differently than White parents (Milkie, Bierman, & Schieman, 2008). Therefore, though the results from the present study can provide a foundation for future research, studies incorporating more racially diverse samples need to be conducted prior to generalizing these results to populations that do not fit within the demographic characteristics of the present study's sample.

Hypothesis 1

To examine the nature of the associations among fathers' physical health, mental health, relationship quality with their spouse, and relationship quality with their adult children, I first drew upon the concept of linked lives within Life Course Theory to hypothesize that each of these concepts would be positively correlated with one another. An examination of the correlations among these latent variables within each age group

provided general support for this hypothesis; within each age group, fathers' physical health and mental health, mental health and relationship quality with their spouse, and mental health and relationship quality with their child were statistically significantly correlated. Of the associations among these constructs, the only association that did not reach statistical significance across age groups was between father's physical health and relationship quality with his child.

The correlations found in this study are similar to those found in other studies using similar constructs. The positive associations between men's mental health and marital quality (Holt-Lunstad, Birmingham, & Jones, 2008; Leach, Butterworth, Olesen, & Mackinnon, 2013; Ryan & Willits, 2007), mental health and relationship quality with their children (An & Cooney, 2006; Kotila & Kamp Dush, 2013; Ryan & Willits, 2007), physical health and marital quality (e.g., Bookwala, 2005; Holt-Lunstadt, Birmingham, & Jones, 2008; Margelisch, Schneewind, Violette, & Perrig-Chiello, 2017) and men's physical and mental health (Fukukawa et al., 2004; Syrda, 2017) have all been well-documented. Positive mental health in fathers has been associated with better marital and parent-child relationship quality, as well as better physical health.

The results of the current study extend the scope of our understanding of the relationships among each of these variables in two ways: First, this is the first study in which each of these variables has been included in a single model, allowing for direct comparisons of the relative strength of the correlations among these variables. Second, structuring the data to reflect fathers' ages allowed for age-related patterns of change to be manifested. Within this structure, one can see that, for fathers between the ages of 57- and 62-years-old (pre-retirement) and between 69- and 74-years-old (post-retirement), the

most powerful correlation was between their physical and mental health, followed by their mental health and marital relationship quality, with the correlation between the marital relationship quality and parent-child relationship quality being the third most powerful. Therefore, for fathers in the 57-to-62-year-old and 69-to-74-year-old age groups, their mental health is most closely tied to their own physical health and their marital relationship quality. However, for fathers between the ages of 63- and 68-years-old, the most powerful correlation was between their mental health and their relationship quality with their child, followed by similar strengths in correlation between their physical health and mental health, and mental health and marital relationship quality. Thus, fathers' relationship quality with their child appears to take on greater salience in fathers' lives between 63- and 68-years-old than it does in the 57-to-62-year-old and 69-to-74-year-old age groups. These changes for fathers between the ages of 63- and 68-years-old suggest the possibility of a transition occurring in men's lives within this time frame. As indicated above, one such transition within this age range could be retirement. Between the years 1960 and 1995, most men in the United States retired around the age of 63-years-old (Gendell, 1998). Research has shown that retirement can be a time of uncertainty and stress (Nuttman-Shwartz, 2004), when men must reevaluate their personal identities and adjust to changes in interpersonal relationships (Barnes & Parry, 2004), including changes in their marital dynamics (Kulik, 2001) and relationships with their children (Davey & Szinovacz, 2001). Davey and Szinovacz (2001), in particular, found that fathers' frequency of visits with their children increased following retirement, which aligns with the increased salience of father-child relationship quality in fathers' lives found in the present study. Therefore, it is possible that the transitions and

reevaluations associated with retirement result in the changes in the strength of associations exhibited for fathers between the ages of 63- and 68-years-old in the present study. Future research assessing the impact of retirement on father-child relationship quality could be important to explore.

The lack of a statistically significant correlation between fathers' physical health and their relationship quality with their focal child was somewhat surprising, given the previous research that has shown associations between fatherhood and various aspects of fathers' health (e.g., Clark et al., 1987; Gettler, McDade, Feranil, & Kuzawa, 2012; Lawlor, 2003; Smith & Zick, 1994; Verbrugge, 1983). However, other studies on the association between fatherhood and fathers' physical health have also found no correlation between fathers' physical health and fatherhood. In their study on the association between the quality of the parent-child relationship and mortality risk, for example, Hibbard and Pope (1993) found that the father-child relationship was not associated with either morbidity or mortality 15 years later. Similarly, Kotler and Wingard (1989) found that fatherhood was unrelated to men's mortality risk over an 18-year period.

There are a few potential explanations for the mixed findings. One possibility is related to the measures used in each study. The majority of studies in which an association was found simply examined the effects of having children on men's physical health outcomes. In other words, the presence of children seems to impact fathers' physical health when compared to non-fathers. In the current study, however, fathers were not compared to non-fathers. Rather, associations were examined between the

quality of the parent-child relationship and fathers' physical health among men who were fathers.

Relatedly, it is also possible that slight variations in the physical health measure could yield different results. For example, rather than ask about the respondents' health in comparison to others their same age, as was used in the current study, Ryan and Willits (2007) asked for a direct self-assessment of the respondents' health, irrespective of how it related to others in the respondents' same age group. Thus, fathers who were in poor health, but who believed their poor health was on par with the health of their peers, would provide a different answer in the current study than they might if they were simply asked to rate their health, irrespective of their peers. Additionally, whereas Ryan and Willits included a measure of the impact that the respondents' health had on the respondents' functional ability, the current study did not include a measure of the impact on daily functioning. Rather, the respondents in the sample for the current study only indicated the number of chronic problems they experienced. It is possible that these subtle differences in the physical health measure caused the difference in the studies' results.

A second explanation might also be plausible. In the Ryan and Willits (2007) study, the association between fathers' physical health and their relationship quality with their children disappeared in the subsequent regression analysis, similar to the results obtained in the current study (discussed below). Though the correlation between fathers' physical health and their father-child relationship quality never reached statistical significance in the present study, it did reach trend-level significance for fathers between the ages of 63- and 68-years-old. In a second study, in which a statistically significant association was found between fatherhood and health status, Verbrugge (1983) found that

fatherhood, nevertheless, had the weakest association of the predictors used. Another study found only trend-level significance between fatherhood and health outcomes (Haynes, Eaker & Feinleib, 1983). Given these trends, it is possible that, for fathers over the age of 57-years-old, a weak association does, indeed, exist between their physical health and their relationship quality with their child, but the weakness of the association only allows it to be manifested under certain conditions. With fathers' increasing longevity (U.S. Census Bureau, 2011a) and levels of involvement with their children (Parker & Livingston, 2018), it may be important to more fully explore the association between fathers' physical health and relationship quality with their children, as that association may have changed since the data for the present study were collected.

As opposed to the parent-child relationship, the association between fathers' physical health and their relationship quality with their spouse showed significant associations for fathers aged 57-to-62-years-old and fathers aged 69-to-74-years-old. This difference in the association between fathers' marital quality and their parent-child relationship quality as they relate to fathers' physical health can potentially be explained by the difference in roles fathers play in relation to their children and their spouse. In two-parent households, parents can work in tandem to meet children's needs (Talmi, 2013). Thus, children's needs that cannot be met by the father due to poor physical health might be able to be taken care of by the other caregiver, preventing the child from experiencing an increase in strain based on fathers' poor physical health (thus preserving the father-child relationship). In marital relationships, on the other hand, spouses share the burdens associated with daily living and raising a family (Talmi, 2013). Therefore, the consequences of a fathers' poor physical health, and any physical disability that the

father experiences because of it, could be more likely to be experienced by an increase in responsibility by his spouse. Given previous research that has shown that mothers generally experience higher levels of parenting stress than fathers (Umberson, Pudrovska, & Reczek, 2010), it is possible that an increase in responsibility due to fathers' physical limitations increases the stress already felt by mothers. This deviation from the expected division of roles within the marriage and potential increased maternal stress could create greater dissatisfaction in the marriage, manifested in the negative association between poor physical health and marital quality. Additionally, due to the more egalitarian nature of marital relationships (compared with the hierarchical nature of parent-child relationships), fathers might also have a higher expectation of viewing their spouse as a source of emotional support. Thus, their poor physical health could have a dual effect on their spouse, both in terms of limitations in the ability to provide instrumental help and in the increase in emotional burden the spouse might experience due to being an emotional support for her husband.

Hypothesis 2

Following the examination of the correlational relationships among fathers' physical health, mental health, relationship quality with their spouse, and relationship quality with their adult children within each age group, I next examined the ability of each latent variable to predict outcomes in itself and the others across time. Again, the concept of linked lives within Life Course Theory suggests that fathers' personal characteristics would impact their relationships with their spouse and children, while at the same time being influenced by each of those relationships. Thus, we hypothesized that cross-lagged effects would be manifested for each variable across all age groups. The

data, however, did not support this hypothesis. Across all age groups, the only statistically significant cross-lagged effect was seen from fathers' mental health between the ages of 69- and 74-years-old to the father-child relationship quality for fathers between the ages of 75- and 80-years-old, in which better mental health predicted better relationship quality with their children six years later. These results suggest that the best predictor of each variable is its own previous value and that the other predictors do not add significantly to the ability to predict other variables' outcomes (e.g., the best predictor of fathers' mental health at any age range is their previous mental health). These results were quite surprising in light of other studies that either showed longitudinal effects (e.g., Kaplan & Kronick, 2006; Smith & Zick, 1994) or cross-sectional predictive ability (e.g., Bookwala, 2005; Holt-Lunstad, Birmingham & Jones, 2008; Ryan & Willits, 2007; Schoenborn, 2004; Verbrugge, 1983) from one variable onto another. However, in the vast majority of the studies in which such effects are seen, the autoregressive pathways are often not controlled for (which is not a possibility in cross-sectional studies). In the studies in which the autoregressive paths, or at least a baseline assessment of a similar construct, were controlled for (e.g., Hibbard & Pope, 1993; Nomaguchi & Milkie, 2003), the cross-variable effects are not significant. In one study, the initial associations among fatherhood and physical health outcomes disappeared once baseline physical health effects were controlled for (Lawlor et al., 2003). These results highlight the importance of controlling for autoregressive paths or previous states of a dependent variable (which requires longitudinal study designs) prior to drawing conclusions about the effects of one variable on another. One of the strengths of the present study was the ability to control for the previous state of each dependent variable.

The overwhelming predictive power of the autoregressive paths in the present study seems to indicate high levels of stability and consistency in each of these domains of fathers' lives relative to their peers for fathers between the ages of 57- and 80-years old. In other words, fathers who exhibit above average traits within one domain between 57- and 80-years-old tend to continue to exhibit above average traits relative to their peers in that same domain six years later. The same is true for fathers who exhibit below average traits in each of these domains: below average traits within one domain tend to continue six years later for fathers between the ages of 57- and 80-years-old. This within-domain stability relative to their peers can be seen, not only in the fact that the autoregressive paths were the only statistically significant paths in the structural equation models, but also in the standardized path coefficients among those paths and the total variance explained in each outcome variable, as discussed in the next paragraphs.

Regarding parent-child relationship quality, for fathers between the ages of 63- and 68-years-old, 55% of the variance in their relationship quality with their focal child was predicted by their relationship quality six years prior ($\beta = .65$), with no other statistically significant predictors contributing to the model. For fathers between the ages of 69- and 74-years old, 60% of the variance in father-child relationship quality was accounted for by their previous relationship quality ($\beta = .49$), with the frequency of contact between the father and child also reaching statistical significance ($\beta = .44$). For fathers who were 75- to 80-years-old, 93% of the variance was explained by their previous relationship quality ($\beta = .68$) and the child's sex ($\beta = -.17$), indicating that fathers show slightly better relationship quality with their sons. As noted above, the fact that such a significant amount of the variance in fathers' parent-child relationship quality

is accounted for by the parent-child relationship quality from six years before indicates a high level of stability in the quality of their relationships relative to their peers. By the time fathers are between the ages of 75- and 80-years-old, there is very little variance in parent-child relationship quality that is not explained by knowing the previous status of their relationship quality with their child, indicating very little change relative to the sample's mean is taking place within those six years. In other words, fathers who have above average relationship quality with their child between the ages of 69- and 74-years-old generally continue to enjoy above average relationship quality six years later, while fathers who experience less than average relationship quality between the ages of 69- and 74-years-old generally continue to experience less than average relationships with their children six years later.

The level of apparent stability of the quality of relationships relative to their peers is even more pronounced in the models predicting fathers' marital relationship quality. For fathers between the ages of 63- and 68-years-old, 80% of the variance was explained by their marital quality between the ages of 57- and 62-years-old (β = .66) and the occurrence of divorce or separation (β = -.48), suggesting that fathers who had divorced showed lower marital quality. For fathers between the ages of 69- and 74-years-old, 81% of the variance in their marital quality was explained for fathers between the ages of 69- and 74-years-old (ß = .82), with the amount of support received by the child also contributing (β = .22) and the child's age contributing at the trend level (β = -.17), indicating that fathers of older children reported lower marital quality. By the time fathers were between the ages of 75- and 80-years-old, 91% of the variance in their marital quality was predicted by their marital quality between the ages of 69- and 74-years-old

(β = .86) and their focal child's age (β = -.20), again, indicating that fathers of older children reported lower marital quality. The relative strengths of the standardized path coefficients suggest that fathers' previous marital relationship quality is by far the most powerful predictor of their marital relationship quality six years later. Based on these results, fathers' marital quality relative to others in their age group appears to change very little after fathers are between the ages of 57- and 62-years-old. These findings are consistent with other studies that found high levels of stability in marital quality among older adults, even across the transition through retirement (Fitzpatrick & Vinick, 2003).

Regarding the negative association between fathers' marital quality and their focal child's age seen in the groups of fathers between 69- and 74-years-old and 75- and 80-years-old, it is possible that the focal child's age acted as a proxy for marital duration, such that individuals in longer marriages had older children. Studies have shown that marital quality tends to decline over time (Umberson et al., 2005; VanLaningham, Johnson, & Amato, 2001). If the focal child's age were acting as a proxy for marital duration, the results from the present study would be in line with those from other studies that also show a gradual decline in marital quality over time.

In the models predicting fathers' mental health, there was more unexplained variance than in the models predicting fathers' quality of relationships. Nevertheless, a significant portion of the variance in fathers' mental health was explained by each model. For fathers between the ages of 63- and 68-years-old, 67% of the variance in their mental health was explained by their mental health when they were between the ages of 57- and 62-years-old (β = .61) and by their frequency of contact with their focal child (β = -.23), indicating that fathers who had less frequent contact with their focal child reported better

mental health. For fathers between the ages of 69- and 74-years-old, 59% of the variance in their mental health was explained by their mental health six years prior (β = .80) and their geographic distance from their focal child (β = .20), indicating that fathers who lived farther distances from their focal child exhibited better mental health. Finally, for fathers between the ages of 75- and 80-years-old, 73% of the variance in their mental health was explained by their mental health when they were 69- to 74-years-old, with no other predictor contributing significantly to the model. As with the previous models, the results from the models predicting fathers' mental health indicate high levels of stability in fathers' mental health outcomes in relation to the sample's mean, especially by the time fathers are between the ages of 75- and 80-years-old. The implications of this relative stability in men's mental health are discussed below.

The finding of a negative association between fathers' mental health and their frequency of contact with their focal child was somewhat surprising. However, it is possible that one of two potential relationship dynamics may be involved in this counterintuitive finding. First, studies have shown that negative events in adult children's lives have negative impacts on parents' mental health (Greenfield & Marks, 2006; Milkie, Bierman, & Schieman, 2008). It is possible that fathers who have the most frequent contact with their focal child are doing so in response to stressors that the child is experiencing that simultaneously create mental health stressors for the father. Alternatively, it is also possible that fathers who are experiencing a greater amount of mental distress reach out to their focal child more frequently. As indicated above, the time period between 63- and 68-years-old is often a time when fathers retire from the work force and must navigate a reevaluation of their own identities and interpersonal

relationships. It is possible that fathers who establish the greatest frequency of contact with their children during this time are those who feel the greatest mental distress during this transition period. Future research exploring the circumstances behind the frequency of contact between fathers and their children within this age range would be helpful to provide greater clarity regarding the reasons for the negative association exhibited between fathers' mental health and their frequency of contact with their focal child.

Physical health was the area in fathers' lives that had the least percentage of variance explained by the model, though a considerable amount was explained for each age group. For fathers between the ages of 63- and 68-years-old, 44% of the variance was explained by their physical health when they were between the ages of 57- and 62-years-old ($\beta = .73$). Eighty-one percent of the variance in fathers' physical health between the ages of 69- and 74-years-old was explained by their physical health six years prior ($\beta = .83$). This number drops to 60% of the variance in fathers' physical health between the ages of 75- and 80-years-old being explained by their physical health between the ages of 69- and 74-years-old, without any other significant predictors contributing to the model. These results indicate that the fathers in this sample experienced a relatively high level of stability relative to the sample's mean between the ages of 63-to-68-years old and 69-to-74-years-old. Between the ages of 57-to-62-years old and 63-to-68-years-old, and again between 69-to-74-years-old and 75-to-80-years-old, there is a relatively high amount of variation in fathers' health that is not explained by their previous health, nor is it explained by any of the covariates in the model. This variation in fathers' physical health is expected, given the natural decline in health that occurs after men reach 60-years-old (Fillenbaum et al., 2016; Jokela et al., 2010).

The relative stability and consistency seen across the results of this study are, perhaps, not surprising when considering these fathers' life circumstances. The average age of the focal child was 35-years-old for fathers between the ages of 57- and 62-years-old. Therefore, by this age, fathers have had an average of over 15 years to acclimate to at least one child transitioning to adulthood and potentially leaving the home. Additionally, over 95% of fathers in this sample had become grandfathers by the time they were between the ages of 63- and 68-years-old. In all of the age groups except for the fathers who were between the ages of 75- and 80-years-old, less than 5% experienced divorce. This stability in marriage is also exhibited in the general population; between 1990 and 2015, the rate of divorce among adults over 50-years-old was between .5% and 1% (Stepler, 2017). Given the stability present within each of these areas of fathers' lives, there are very few major life transitions within these domains that these fathers experienced within the time frame of the study. The tenets of Life Course Theory suggest that a lack of major transitions would be associated with stable traits. Therefore, given the lack of transitions these fathers experienced, it is possible that the patterns and characteristics in these men's lives were essentially set by the time they reached the age of interest for this study.

In addition to the possibility that the lack of cross-lagged effects was due to relative stability within each of these domains in fathers' lives, it is also possible that the lack of cross-lagged effects was due to the presence of unexplored moderated relations among each of these domains. Multiple studies (Hallberg, 1992; Hemström, 1996; Shapiro & Lambert, 1999) indicate, for example, that the influence of children on fathers' physical or mental health is dependent upon the fathers' marital relationship status.

Hemström (1996) found that the presence of children reduced divorced fathers' risk of mortality, and Hallberg (1992) found that divorced men who had custody of their children or who were in a stable relationship experienced fewer health problems than divorced men who lived alone. Therefore, it is possible that the relative influence of fathers' relationship quality with their children on their own physical and mental health is moderated by the fathers' relationship quality with their spouse. Fathers who have positive, stable marital relationships might not benefit from positive relationships with their children to the same degree that single fathers or fathers in negative marital relationships might. Additionally, adult children who experience some form of intergenerational ambivalence in their relationships with their fathers (i.e., the simultaneous presence of both sides of polarized attributes within their relationship, such as conflict and affinity; Lüscher & Pillemer, 1998) might have a qualitatively distinct impact on fathers' mental and physical health than adult children whose relationships with their fathers are expressly positive or negative. Such moderated effects could be masked in the linear regression models used in the present study.

It is interesting to note that the one significant cross-lagged path occurred between fathers' mental health when they were between the ages of 69- and 74-years-old and the father-child relationship quality when fathers were between the ages of 75- and 80-years-old. As noted above, the premises of Life Course Theory suggest that periods of transition in men's lives are likely to be associated with disruptions to established patterns within their relationships. As Fingerman (2000) noted, the period when fathers enter late adulthood and children are entering middle adulthood is often associated with a final transition in the direction of support from children to parents. Within this sample,

the average age of the fathers' focal child was 45-years-old (the early stages of middle-adulthood) when fathers were between the ages of 69- and 74-years-old. The impact of fathers' mental health on their relationship quality with their child when fathers are 75-to-80-years-old could be a result of this shift toward fathers' dependency on their children. As fathers become more dependent upon their children, and children provide more care for their fathers, it is possible that fathers' mental health becomes a more salient factor in determining the relationship quality between father and child.

Hypothesis 3

Based on the previous research related to the relative strength of influence that spouses and children have on fathers' physical and mental health, I hypothesized that fathers' relationship quality with their spouse would be a more powerful predictor than their relationship quality with their adult children of their own physical and mental health over time.

This hypothesis presupposed the existence of cross-lagged effects within each of the fathers' age groups. For the reasons detailed above, though it was initially unexpected that the autoregressive paths would be so overwhelming across age groups, with a recognition of the lack of major transitions that the fathers within these age groups makes, the degree of stability manifested in the results is more understandable. In recognition of that stability, it is perhaps not surprising that neither type of relationship quality would be an effective predictor of fathers' physical or mental health outcomes after controlling for fathers' previous physical and mental health.

Hypothesis 4

In order to understand how the nature of the associations among fathers' physical health, mental health, relationship quality with their spouse, and relationship quality with their child change as fathers age in middle-to-late adulthood (research question 2), I hypothesized that that the relative influence of their relationship quality with their child on their own mental and physical health would increase over time. In other words, the parent-child relationship quality would be a more powerful predictor of fathers' mental and physical health for older fathers than for the fathers in the younger age groups. Furthermore, I hypothesized that, as fathers aged and the number and power of influences outside of their family decreased, the relative strength of influence from their spouse and children on their mental and physical health would increase.

As was the case with the third hypothesis, this hypothesis also presupposed the existence of cross-lagged effects within the models, which did not exist. However, although the hypothesis of fathers' interpersonal relationships increasing in predictive power was not supported, interesting information was gained related to the manner in which the associations among these variables change (or remain stable) over time. The level of stability manifested across age groups, especially in the time between the 69-to-74-year-old age group and the 75-to-80-year-old age group, suggests that there is very little change in relative predictive power among any of the variables for fathers over 57-years-old.

The one exception to this general stability was in father-child relationship quality, for which fathers' mental health between the ages of 69- and 74-years-old became a significant predictor for fathers between the ages of 75-and-80-years-old. As noted

above, it is possible that this emergent predictive ability of fathers' mental health on their subsequent relationship quality with their child marks the entry into a transition period in the father-child relationship in which fathers become more dependent upon their children. Contrary to the relative stability exhibited in other areas of men's lives after they enter their 60s, such a transition would indicate that the father-child relationship undergoes at least one more considerable change late in fathers' lives.

Summary of Research Question Findings

The present study sought to increase our understanding of 1) the nature of the associations among fathers' physical health, mental health, relationship quality with their spouse, and relationship quality with their adult children over time in middle-to-late adulthood, and 2) how these associations change as fathers age in middle-to-late adulthood. The findings indicate that fathers' mental health is strongly correlated with their physical health, marital relationship quality, and relationship quality with their focal child across all age groups of fathers between 57- and 80-years-old. For fathers between 63- and 68-years-old, a transition seems to occur that increases the within-time salience of fathers' relationship quality with their focal child, during which fathers' relationship quality with their child increases in associational power with both their mental and physical health. In spite of the strong bivariate correlations, the structural equation models revealed high levels of within-trait stability relative to the sample's mean and a lack of cross-trait predictive power among each of these aspects of fathers' lives across age groups, evidenced by the little change in each trait's predictive ability as fathers aged in middle-to-late adulthood. The lone exception to this was in the emergence of a significant effect from father's mental health between 69- and 74-years-old to their

father-child relationship quality between 75- and 80-years-old, suggesting the possibility of a final transition in father-child relationship dynamics late in fathers' lives.

Limitations

There are several limitations to this study that should be considered when interpreting the results. First, as previously indicated, over 96% of the sample identified as White and over 65% had received at least some college education, while over 90% had completed high school. Additionally, the original study sample was drawn from heterosexual individuals who had health insurance within the same state and who had access to three generations of their family; within any one age group in the present study, no fewer than 93% of the sample remained married. Therefore, this sample was representative of heterosexual, White, relatively well-educated fathers from mostly intact, traditional family structures. Though the results from this study may provide a baseline from which to orient future research, the homogeneity of the sample in terms of participants' race, sexual orientation, and family structure preclude generalizing the results to other populations. Future research that includes greater diversity in each of these areas is necessary to determine the generalizability of these results to other populations.

In addition to the demographic characteristics and family structures of the present study's sample, consideration must also be given to the birth cohort from whom these data were gathered. Due to the timing of the waves of data collection and the focal age range of fathers in this study, only one cohort of fathers was able to be included in the analyses. The vast majority of fathers included in this study were between the ages of 55-years-old and 69-years-old in 1988, meaning that they were born between 1919 and 1933,

predating the "baby boom" generation. The sociocultural environment in which they became fathers was one of economic stability in which it was the norm for a man to remain in one job for the majority of his career. The average age of marriage for men was about 23-years-old (U.S. Census Bureau, 2018) and the traditional two-parent, heterosexual family structure was the rule. Much has changed in the sociocultural environment in the United States in the 30 years since that time. The average age of marriage for men has increased to approximately 30-years-old (U.S. Census Bureau, 2018), cohabitation has become a common living arrangement (Gurrentz, 2018), the likelihood of divorce has increased, gay marriage has been legalized, and unstable economic conditions have resulted in adult children returning to live with their parents following first departure with greater frequency (Pew Research Center, 2012). It is likely that these sociocultural changes have created changes in the relationship dynamics between parents and their adult children than those that existed for the cohort of fathers included in the present study. For example, the economic instability and resultant increase in adult children living with their parents could slow or delay aging parents' traditional transition from provider to recipient of care from their adult children. Additionally, the increase in diversity and fluidity of family structures could also have altered parent-child relationship dynamics in a way that has reshaped the relative importance of fathers' relationships with their children on their own physical and mental health.

Second, due to the structure of the data set, separate structural equation models had to be completed for each outcome variable, rather than being able to create a single model that incorporated all age groups and outcome variables at once. Therefore,

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statistical comparisons among pathways between age groups were not able to be computed; though these results can provide a foundation upon which similarities and differences can be statistically evaluated in future studies, such comparative conclusions cannot be drawn from this study.

Relatedly, due to the smaller number of fathers between the ages of 75- and 80-years-old who completed the battery of questionnaires, I was unable to include the same covariates across models in the structural equation models predicting outcomes for fathers between the ages of 75- and 80-years-old. This lack of uniformity across models creates limitations in the ability to compare results across models. Though the general pattern of the dominance of the autoregressive paths continued, it is possible that the inclusion of all of the covariates in the models for the final age groups would have yielded different outcomes. Conducting analyses with more complete data for fathers aged 75-to-80-years old would help to solidify the results of this study.

The use of six-year intervals for the fathers' age groups is the source of another limitation in the present study. It is possible that six years was too great a duration for the cross-lagged traits to maintain predictive power. For example, though fathers' marital relationship quality may indeed affect their mental health, it is possible that such effects are only manifested over shorter periods; the effects of marital quality might not be salient enough to continue to predict fathers' mental health six years later, barring extraordinary events. It is more likely that fathers' mental health is predicted by more concurrent relationship quality, both with their spouse and children, as opposed to their relationship quality from six years before. The same is likely true for the inverse – fathers' relationship quality is most likely influenced by their concurrent mental and

physical health, rather than their mental and physical health from six years previous. Future studies incorporating shorter time intervals between age groups could help to illuminate the shorter-term dynamics among each of these dimensions.

A fourth limitation is related to the use of a focal child as a predictor in the study, rather than incorporating fathers' relationships with all of his children. For the data used in the present study, the focal child was selected by the families during the first wave of data collection. Though the use of a focal child is common practice when studying parent-child relationship quality, it is possible that fathers of more than one child experienced different dynamics with their other children than they experienced with their focal child, which would, in turn, have a confounding effect on the outcome variables. An attempt to control for this possibility was made by including a measure of the total support the father received from people other than his wife and focal child ("functional solidarity with others"). However, it is possible that the influence of the relationship dynamics with each individual child is more than the sum of their individual parts. A potential next step in generating greater understanding of the influence of parent-child relationships on fathers' well-being would be to explore their relationship with multiple children.

Fifth, for the indicators of physical health, the measure of chronic problems only listed the number of chronic problems, rather than the severity. Other studies measuring the impact of fathers' health on their own mental health found that severe health problems were predictive of greater levels of depression for middle-aged fathers (Fukukawa et al., 2004). Furthermore, in the present study there were no indicators of the degree to which the health problems impacted their daily activities, especially in their

interpersonal relationships. It is possible that measuring severity of health problems and including a measure of its impact on fathers' daily functioning would more accurately assess the association between a father's overall health and his interpersonal relationships, rather than simply indicating whether he experienced a specific health problem; fathers who only experience mild health symptoms might not be personally affected to the degree necessary to impact their interpersonal relationships, or vice versa.

Additionally, measures of physical health in the present study only examined health outcomes. It is possible that including measures of health behaviors (i.e., eating healthy meals, exercising regularly, etc.) could address some of the causes for the unexplained variation in fathers' health seen in the present study. Research has shown that marital and familial relationships do impact men's health behaviors (Forbat et al., 2014); thus, including such measures in future research could help to more ably explain the differences in men's health outcomes exhibited in the present study.

Another limitation within the measures is related to the fathers' frequency of contact with their focal child. In this study, frequency of contact was represented by the highest frequency of contact among several different forms, including in-person, by phone, by mail, and, beginning in wave 6, via email. It is possible that the frequency of contact for in-person visits carries different interpersonal dynamics for the people involved, and therefore, has different consequences than the same frequency of contact in more distant forms. Future studies examining the relative influence of each form of contact could provide greater insight in this area of potential impact.

Implications

In spite of these limitations, the results from this study provide valuable insights regarding the associations among fathers' mental health, physical health, parent-child relationship quality, and marital relationship quality for fathers over the age of 57-years-old. Prior to this study, no other research had incorporated all four of these variables in an autoregressive cross-lagged design. The surprising stability within each domain relative to the participants' peers and the lack of cross-variable influence exhibited in each of these areas of men's lives between the ages of 57- and 80-years-old would have been masked in a cross-sectional or non-autoregressive study design. In fact, it was partially due to the lack of such a design in previous studies that the hypothesized results differed to such an extent from the observed results. This highlights the need for continued use of similar study designs in the future in order to gain greater understanding of the true degree of cross-variable influences affecting fathers. Additionally, it also highlights the caution that should be shown when attempting to draw conclusions about the influence of one variable on another in cross-sectional research or longitudinal research that does not account for baseline measures of the dependent variable.

The lack of cross-lagged effects exhibited in this study suggest that the patterns of fathers' intra- and interpersonal interactions might be largely set before fathers enter their 60s. Though this study did not examine the potential influence or effectiveness of interventions designed to improve any one of these areas of fathers' lives after fathers had already reached this stage of life, the results of this study suggest a possibility that interventions timed to occur around major transitions in fathers' lives could have long-

term effects if they are able to be incorporated into fathers patterns prior to this stage of life. For example, social policies and initiatives designed to help fathers navigate the transitions associated with retirement could potentially alleviate the mental distress that men experience during that period of reevaluation and provide a solid foundation that could remain with them through the next period of stability in their lives.

In addition to practical implications, the results of the present study also have implications for our understanding and application of Life Course Theory.

First, Life Course Theory posits that one's stage of life is an important factor to consider when assessing the impact of interpersonal relationships on an individual (Rossi & Rossi, 1990), necessitating a diachronic approach to the study of men's lives (Bengtson & Allen, 1993). Whereas the transition to parenthood and raising young children has been associated with multiple deleterious effects on fathers' physical and mental health (Durette, Mars, & Gray, 2010), similar negative effects were not exhibited by fathers of adult children in the present study, providing support to the notion of a dynamic nature of change across the life course and the attendant importance Life Course Theory places on stage of life considerations and diachronic methods.

Similarly, Life Course Theory suggests that periods of transition across stages of life would be associated with the greatest fluctuations in the relative influence of men's interpersonal relationships on their own well-being. A corollary, then, would suggest that periods free from transitions would be associated with stability in the relative influence of interpersonal relationships on their well-being. Based on the concept of linked lives, not only fathers, but also their spouses and children would have to be in life stages free from major transitions in order for the fathers to experience such stability in the relative

influence of their interpersonal relationships. This supposition is supported by the results of the present study. Though the sample of fathers in the present study likely experienced declines in physical health associated with aging, they experienced few of the relatively rapid life transitions that are present in other stages of life, such as having children leave the home. Additionally, the focal children in the study were also in stages of life that are relatively free from most rapid transitions. The average age of the focal children was 35-years-old for fathers who were between 57- and 62-years-old (the youngest age group of fathers in the present study) and was 50-years-old for fathers who were between 75- and 80-years-old (the oldest age group in the present study). Thus, the focal children in the present study would have already transitioned into adulthood, likely completed their education, and started their own families and careers. Indeed, 85% of the fathers in the youngest age group (57- to 62-years old) already had grandchildren. As expected, low levels of change in the relative importance of fathers' interpersonal relationships on their own physical and mental health were exhibited. Furthermore, the times of potential transition (e.g., times associated with retirement and the arrival of grandchildren, when fathers were between 63- and 68-years-old, and the greatest physical health decline, when fathers were between 75- and 80-years-old) were associated with the greatest variations in fathers' interrelational patterns, exhibited by greater salience of the parent-child relationship for fathers between 63- and 68-years-old in the bivariate correlations and statistically significant predictive power of fathers' mental health on their parent-child relationship quality for fathers between 75- and 80-years-old.

Finally, the concept of linked lives within Life Course Theory posits connections between individuals' ontogenetic development and their interpersonal relationships. The

number and magnitude of statistically significant correlations between fathers' physical health, mental health, relationship quality with their spouse, and relationship quality with their children provides support for such hypothesized connections. Each of these findings suggests that Life Course Theory serves as a good guide for framing studies of men's lives.

Future Research Directions

As noted above, it is possible that the lack of significant cross-lagged effects was due to the unexplored presence of moderation within the associations among the variables in this study. Therefore, future research exploring the possibility of nonlinear associations or moderation with the associations between father-child relationship quality, marital relationship quality, and fathers' physical and mental health are warranted.

Second, the concept of linked lives in Life Course Theory suggests that fathers' developmental trajectories would be influenced by the developmental trajectories or characteristics of the people around them. In the present study, I did not examine how fathers' mental and physical health trajectories are influenced by the trajectories or characteristics of the people closest to them. Future research could explore whether the influence of relationship quality on fathers' outcomes is itself moderated by the developmental trajectory or characteristics of the person with whom they have the relationship, or vice versa. For example, if fathers have a positive relationship with their child, and that child suffers from negative physical or mental health or environmental circumstances, does that affect the fathers' own developmental trajectory in a way that is different from fathers who have a negative relationship with their child who is under a similar developmental trajectory? It is possible that fathers who enjoy positive

relationships with children who exhibit positive life trajectories in their own lives experience high levels of positive benefits, while fathers who endure negative relationships with their children who are exhibiting negative life trajectories experience greater levels of negative effects, thereby creating a "fanning effect." Such an effect would not be apparent without the use of moderation analyses.

Finally, the results from this study indicate that the time between the ages of 63-years-old and around 80-years-old is a time of relative stability in men's lives in which their relationship patterns relative to their peers do not seem to undergo significant transitions. Future longitudinal research that incorporates the same variables spanning the time before, through, and after transitions in fathers' lives (e.g., as children transition to adulthood, or as fathers enter into the time of dependency on their children in late adulthood) could provide more information on how the physical and mental health effects of young children on fathers (e.g., Durette, Mars, & Gray, 2010) become integrated into fathers' mental and physical well-being prior to this stage of stability and how they are renegotiated in late-adulthood.

Appendices

Appendix A

Intergenerational Feelings of Conflict

1. Taking everything into consideration, how much CONFLICT, TENSION, or DISAGREEMENT do you feel there is between you and your "study" son or daughter at this point in your life?

    ___ Not at all   ___ Pretty much
    ___ A little   ___ Quite a bit
    ___ Some   ___ A great deal

2. How much do you feel your "study" son or daughter is CRITICAL of you or what you do?

    ___ Not at all   ___ Pretty much
    ___ A little   ___ Quite a bit
    ___ Some   ___ A great deal

3. How much does your "study" son or daughter ARGUE with you?

    ___ Not at all   ___ Pretty much
    ___ A little   ___ Quite a bit
    ___ Some   ___ A great deal

Appendix B
Affectual Solidarity

1. Taking everything into consideration, HOW CLOSE do you feel is the relationship between you and your "study" son or daughter at this point in your life?

___ Not at all close	___ Pretty close
___ Not too close	___ Very close
___ Somewhat close	___ Extremely close

2. How is COMMUNICATION between you and your "study" son or daughter— exchanging ideas or talking about things that really concern you at this point in your life?

___ Not at all good	___ Pretty good
___ Not too good	___ Very good
___ Somewhat good	___ Extremely good

3. Overall, how well do you and your "study" son or daughter GET ALONG TOGETHER at this point in your life?

___ Not at all well	___ Pretty well
___ Not too well	___ Very well
___ Somewhat well	___ Extremely well

4. How well do you feel your "study" son or daughter UNDERSTANDS YOU?

___ Not at all well	___ Pretty well
___ Not too well	___ Very well
___ Somewhat well	___ Extremely well

5. How well do you feel that you UNDERSTAND your "study" son or daughter?

___ Not at all well	___ Pretty well
___ Not too well	___ Very well
___ Somewhat well	___ Extremely well

Appendix C
Chronic Problems

We would like to know if family members suffer from any chronic illnesses or disabilities. Put a check in the column next to any HEALTH PROB LEMS that you, your spouse/partner, or your mother or father have had IN THE PAST FEW YEARS.

HEALTH PROBLEM	You	Spouse/Partner	Mother	Father
1. Heart problems, angina……………………………	☐	☐	☐	☐
2. High blood pressure………………………………	☐	☐	☐	☐
3. Stroke…………………………………………………	☐	☐	☐	☐
4. Cancer (Type: _____) ……………………	☐	☐	☐	☐
5. Respiratory ailments, asthma , emphysema..	☐	☐	☐	☐
6. Digestive problems………………………………	☐	☐	☐	☐
7. Arthritis or rheumatism……………………………	☐	☐	☐	☐
8. Diabetes………………………………………………	☐	☐	☐	☐
9. Orthopedic problem or injury……………………	☐	☐	☐	☐
10. Cataracts, glaucoma, or retinal degeneration..	☐	☐	☐	☐
11. Hearing impairment………………………………	☐	☐	☐	☐
12. Severe mental or emotional distress…………	☐	☐	☐	☐
13. Drinking problem…………………………………	☐	☐	☐	☐
14. Alzheimer's disease……………………………...	☐	☐	☐	☐
15. Other serious memory problem…………………	☐	☐	☐	☐
16. Obesity………………………………………………	☐	☐	☐	☐
17. Other (specify): _____	☐	☐	☐	☐

Appendix D
Difficulties with Daily Activities

Now we would like to know how much difficulty you and your family (if living) have in performing the activities of daily living listed below. For each question, check one box for you and one for your family member (PLEASE LEAVE QUESTIONS BLANK FOR ANY FAMILY MEMBER WHO IS DECEASED).

	Yes, no difficulty	Yes, but with difficulty	Yes, but needs assistance	Unable to do at all
a. Can walk up and down stairs?				
YOU.....................................	☐	☐	☐	☐
SPOUSE/PARTNER............	☐	☐	☐	☐
MOTHER...........................	☐	☐	☐	☐
FATHER.............................	☐	☐	☐	☐
b. Can walk more than one block?				
YOU.....................................	☐	☐	☐	☐
SPOUSE/PARTNER............	☐	☐	☐	☐
MOTHER...........................	☐	☐	☐	☐
FATHER.............................	☐	☐	☐	☐
c. Can prepare meals?				
YOU.....................................	☐	☐	☐	☐
SPOUSE/PARTNER............	☐	☐	☐	☐
MOTHER...........................	☐	☐	☐	☐
FATHER.............................	☐	☐	☐	☐
d. Can do household chores?				
YOU.....................................	☐	☐	☐	☐
SPOUSE/PARTNER............	☐	☐	☐	☐
MOTHER...........................	☐	☐	☐	☐
FATHER.............................	☐	☐	☐	☐
e. Can take care of own personal hygiene needs, such as bathing and cutting toenails?				
YOU.....................................	☐	☐	☐	☐
SPOUSE/PARTNER............	☐	☐	☐	☐
MOTHER...........................	☐	☐	☐	☐
FATHER.............................	☐	☐	☐	☐

Appendix E
Center for Epidemiological Studies Depression Inventory – CES-D
(Radloff, 1977)

For each of the following statements, check the box that best describes HOW OFTEN YOU HAVE FELT THIS WAY DURING THE PAST WEEK

DURING THE PAST WEEK:	**Rarely or none of the time**	**A little of the time**	**A moderate amount of the time**	**Most or all of the time**
1. I was bothered by things that don't usually bother me……………………………………	☐	☐	☐	☐
2. I did not feel like eating; my appetite was poor…	☐	☐	☐	☐
3. I felt that I could not shake the blues, even with help from my family or friends……………………..	☐	☐	☐	☐
4. I felt that I was just as good as other people………..	☐	☐	☐	☐
5. I had trouble keeping my mind on what I was doing..	☐	☐	☐	☐
6. I felt depressed……………………………………	☐	☐	☐	☐
7. I felt that everything I did was an effort……………..	☐	☐	☐	☐
8. I felt hopeful about the future……………………….	☐	☐	☐	☐
9. I thought my life had been a failure…………………	☐	☐	☐	☐
10. I felt fearful………………………………………..	☐	☐	☐	☐
11. My sleep was restless……………………………….	☐	☐	☐	☐
12. I was happy………………………………………..	☐	☐	☐	☐
13. I talked less than usual…………………………….	☐	☐	☐	☐
14. I felt lonely……………………………………….	☐	☐	☐	☐
15. People were unfriendly…………………………….	☐	☐	☐	☐
16. I enjoyed life……………………………………..	☐	☐	☐	☐
17. I had crying spells……………………………….	☐	☐	☐	☐
18. I felt sad…………………………………………	☐	☐	☐	☐
19. I felt that people disliked me………………………	☐	☐	☐	☐
20. I could not "get going"…………………………….	☐	☐	☐	☐

Bradburn Affect Balance Scale
(Bradburn, 1969)

The following sentences describe how people sometimes feel about their lives. DURING THE PAST FEW WEEKS, did you ever feel: (CHECK ONE BOX FOR EACH QUESTION)

		Yes	No
1.	Particularly excited or interested in something?..	☐	☐
2.	So restless that you couldn't sit long in a chair?..	☐	☐
3.	Proud because someone complimented you on something you had done?....	☐	☐
4.	Very lonely or remote from other people?..	☐	☐
5.	Pleased about having accomplished something?..	☐	☐
6.	Bored?...	☐	☐
7.	On top of the world?..	☐	☐
8.	Depressed or very unhappy?..	☐	☐
9.	That things were really going your way?..	☐	☐
10.	Upset because someone criticized you?...	☐	☐

Appendix G

Rosenberg Self-Esteem Scale – RSES
(Rosenberg, 1965)

Please indicate how much YOU AGREE or DISAGREE with each statement

	Strongly Agree	Agree	Disagree	Strongly Disagree
1. I feel that I'm a person of worth, at least on an equal basis with others……………… □	□	□	□
2. I feel that I have a number of good qualities………….. □	□	□	□
3. All in all, I am inclined to feel that I am a failure…….. □	□	□	□
4. I am able to do things as well as most other people.. □	□	□	□
5. I feel that I do not have much to be proud of………….□	□	□	□
6. I take a positive attitude toward myself………………….□	□	□	□
7. On the whole, I am satisfied with myself……………… □	□	□	□
8. I wish I could have more respect for myself…………… □	□	□	□
9. I certainly feel useless at times………………………… □	□	□	□
10. At times I think I am no good at all………………………… □	□	□	□

Appendix H

Gilford-Bengtson Marital Satisfaction Scale – MSS
(Gilford & Bengtson, 1979)

Here are some things that spouses or partners may do when they are together. (FOR EACH ITEM, CHECK THE BOX THAT BEST DESCRIBES HOW OFTEN YOU DO THESE THINGS).

When You Are With Your Spouse or Partner:	Hardly Ever	Some-times	Fairly often	Quite frequently	Almost always
1. You calmly discuss something together…………	☐	☐	☐	☐	☐
2. One of you is sarcastic………………………	☐	☐	☐	☐	☐
3. You work together on something (dishes, yard work, hobbies, child care, etc.)…………	☐	☐	☐	☐	☐
4. One of you refused to talk in a normal manner (for example, shouting or not talking)………	☐	☐	☐	☐	☐
5. You laugh together…………………………	☐	☐	☐	☐	☐
6. You have a stimulating exchange of ideas……	☐	☐	☐	☐	☐
7. You disagree about something important……	☐	☐	☐	☐	☐
8. One of you becomes critical and belittling…	☐	☐	☐	☐	☐
9. You have a god time together………………	☐	☐	☐	☐	☐
10. One of you becomes angry…………………	☐	☐	☐	☐	☐
11. You disagree about sexual relations…………	☐	☐	☐	☐	☐

Appendix I
Functional Solidarity Scale

We're interested in learning about the kinds of help and support YOU RECEIVE from family, friends, and others. For each type of help and support listed below, put a check in the box beneath each person who gives you that kind of assistance or support (CHECK AS MANY AS APPLY).

	Spouse/ partner	"Study" child	Other son(s)	Other daughter(s)	Study grand-child	Other grand-child(ren)	Brother(s)	Sister(s)	Other relatives /in-laws	Friends/ neigh-bors	Profes-sionals /paid helpers
Household chores……	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Transpor-tation/ shopping……	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Information and advice….	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Financial assistance…	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Emotional support……	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Discussing important life decisions..	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Visiting/ sharing leisure activities…	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Help when you are sick………	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Assistance with personal care (e.g., help with bathing, dressing,etc.).	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

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