The influence of primary caregiver relationship status history and race/ethnicity on youth mental and physical health: The mediating role of precocious life events

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The influence of primary caregiver relationship status history and race/ethnicity on youth mental
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# TABLE OF CONTENTS

## LIST OF FIGURES

v

## LIST OF TABLES

vii

## ABSTRACT

viii

## CHAPTER 1. INTRODUCTION

1

- Study Objectives
- Dissertation Organization

## CHAPTER 2. LITERATURE REVIEW

10

- Relationship Status Typologies: Background, Definitions, and Significance
- The Theoretical Model
- Consistently married caregivers as the reference groups
- Theoretical Background
- The Life Course Perspective
- Family-level Process Theories in Relation to the Life-course Perspective
- Family stress model on precocious life events and mental/physical health
- Family investment model: an alternative model
- Cumulative advantage/disadvantage perspective
- Dimensions of Relationship Status Typologies
- Stability
- Duration
- Biological caregivers
- Single-parenthood
- Critical Periods/timing
- Relationship Status Typologies and Youth Mental/Physical Health Outcomes
- Never-married caregivers and youth health
- Early divorced/separated caregivers and youth health
- Late divorced/separated caregivers and youth health
- Transitional relationship status and youth health
- Physiological Mechanisms Linking Stressful Experiences to Physical/Mental Health
- Race/Ethnicity and Youth Health: Direct and Moderating Influences
- The Influence of Precocious Life Events
- Mediation Role of Precocious Life Events
- Precocious life events and health
- Relationship Status Typologies and Precocious Life Events
- Never-married caregivers and youth precocious life events
- Early divorced/separated caregivers and youth precocious life events
- Late divorced/separated caregivers and youth precocious life events
- Transitional relationship status and youth precocious life events
- Race/ethnicity and Precocious Life Events
- Moderating Influence of Race/ethnicity
- Moderating influence of race/ethnicity by relationship status typologies on health
- Moderating influence of race/ethnicity by precocious life events on health
Marriage Compared to Cohabitation 56
Control Variables 57
Mental/Physical Health Indicators 58
Specific Study Hypotheses 59

CHAPTER 3. METHODS 62
Sample 62
Procedure 65
Measures 66
Individual-Level Wave 1 Measures 66
- Consistently married primary caregivers 66
- Never-married caregivers 67
- Early divorced/separated primary caregivers 67
- Late divorced/separated primary caregivers 68
- Transitional relationship status 69
- Race/ethnicity 70
Precocious Life Events Measures at Wave 3 and 4 70
- Early sexual activity 71
- Early cohabitation 71
- Early marriage 71
- Early leaving home 72
- Early pregnancy 72
- Early full-time work 73
- Early high school dropout 73
- Precocious life events index 73
Outcome Measure at Wave 4 73
- Depressed mood 74
- BMI 74
- Systolic blood pressure 75
- Diastolic blood pressure 75
- Pulse Rate 76
- Mean arterial pressure 76
Community-Level Measures: Wave 1 Contextual Data 76
- Community of origin 77
Controls at Wave 1 77
- Primary caregiver income 77
- Primary caregiver occupational attainment 77
- Caregiver’s education 78
- Caregiver/adolescent gender 78
- General health 78
Analytic Strategy 79

CHAPTER 4. RESULTS 84
Descriptive Statistics, Demographics, and Zero-order Correlations 84
Testing Direct Effects and the Mediation Role of Precocious Life Events 89
Systolic Blood Pressure 89
Diastolic Blood Pressure 99
Pulse Rate 101
Mean Arterial Pressure 106
Body Mass Index 115
Depression at Wave 4 117
The Fully Operationalized Model 122
Testing Nested Models of the Fully Operationalized Model 127
Testing Moderations 130
Results for Ethnicity by Relationship Status Typologies on Youth Health 131
Results for Ethnicity by Relationship Status Typologies on Precocious Life Events 134
Results for Ethnicity by Precocious Life Events on Youth Mental/Physical Health 134

CHAPTER 5. DISCUSSION AND CONCLUSIONS 142
Relationship Status Typologies and Youth Mental/Physical Health: Hypothesis 1 142
Relationship Status Typologies and Precocious Life Events: Hypothesis 2 150
Race/Ethnicity and Youth Mental/Physical Health Outcomes: Hypothesis 3 153
Race/Ethnicity and Precocious Life Events: Hypothesis 4 155
Precocious Life Events and Youth Mental/Physical Health Outcomes: Hypothesis 5 157
Mediation Role of Precocious Life Events 158
Moderations for the Current Study: Hypotheses 6, 7, and 8 160
The Fully Operationalized Model 163
Family SES Indicators and Adolescent Gender 164
Magnitude of Estimated Coefficients 166
Implications 167
Limitations of the Current Study and Recommendations for Future Research 170

REFERENCES 177

APPENDIX: IRB Approval 211

ACKNOWLEDGEMENTS 212
LIST OF FIGURES

Figure 1. The theoretical model of the current study 17
Figure 2. The fully operationalized model addressing study hypotheses 61
Figure 3. Generic theoretical model to establish SEM equations without controls 79
Figure 4. Standardized regression estimates of relationship status typologies on systolic blood pressure 96
Figure 5. Standardized regression estimates of relationship status typologies and ethnicity on systolic blood pressure 97
Figure 6. Standardized estimates of typologies, ethnicity, and precocious life events on systolic blood pressure 98
Figure 7. Standardized regression estimates of relationship status typologies on diastolic blood pressure 102
Figure 8. Standardized regression estimates of relationship status typologies and ethnicity on diastolic blood pressure 103
Figure 9. Standardized estimates of typologies, ethnicity, and precocious life events on diastolic blood pressure 104
Figure 10. Standardized regression estimates of relationship status typologies on pulse rate 107
Figure 11. Standardized regression estimates of relationship status typologies and ethnicity on pulse rate 108
Figure 12. Standardized estimates of typologies, ethnicity, and precocious life events on pulse rate 109
Figure 13. Standardized regression estimates of relationship status typologies on mean arterial pressure 112
Figure 14. Standardized regression estimates of relationship status typologies and ethnicity on mean arterial pressure 113
Figure 15. Standardized estimates of typologies, ethnicity, and precocious life events on mean arterial pressure 114
Figure 16. Standardized regression estimates of relationship status typology on BMI 118
Figure 17. Standardized regression estimates of relationship status typologies and ethnicity on BMI 119

Figure 18. Standardized estimates of typologies, ethnicity, and precocious life events on BMI 120

Figure 19. Standardized regression estimates of relationship status typology on depression 123

Figure 20. Standardized regression estimates of relationship status typologies and ethnicity on depression 124

Figure 21. Standardized estimates of typologies, ethnicity, and precocious life events on depression 125

Figure 22. Plot of interactions for race/ethnicity by relationship status typologies on systolic blood pressure and diastolic blood pressure 136

Figure 23. Plot of interactions for race/ethnicity by relationship status typologies on pulse rate and mean arterial pressure 137

Figure 24. Plot of interactions for race/ethnicity by relationship status typologies on depression 138

Figure 25. Plot of interactions for race/ethnicity by relationship status typologies on BMI 139

Figure 26. Plot of interactions for race/ethnicity by relationship status typologies on precocious life events 140

Figure 27. Plot of interactions for race/ethnicity by precocious life events on depression and pulse rate 141
LIST OF TABLES

Table 1. Sample Demographics 90
Table 2a. Descriptive Statistics for Control Variables at Wave 1 91
Table 2b. Descriptive Statistics for Control Variables at Wave 4 91
Table 3. Correlations of Relationship Status Typologies, Race/Ethnicity, Precocious Life Events and Health Outcomes 92
Table 4. Correlations of Wave 1 Controls, Precocious Life Events and Health outcomes at Wave 4 93
Table 5. The Estimated Path Coefficients of the Fully Operationalized Model of Independent Variables Predicting Outcome Variables 128
ABSTRACT

Researchers have documented that one of the most prominent and significant family demographic changes affecting North America is the increase in single-parents and divorced/separated caregivers raising children. Furthermore, researchers have identified that, although adolescence/early adulthood is considered a time of good health, there is an increasing trend in depressed mood and body mass index, and in adverse cardiovascular functioning. Despite the overwhelming literature on the negative effects of single-parenthood and divorce/separation on mental/physical health, no study to date has investigated the change and stability in relationship status over time on youth mental/physical health outcomes. The purpose of this dissertation is to a) develop relationship status typologies that capture relationship status histories, b) document the effects of these relationship status typologies on mental/physical health outcomes, c) capture proximal processes of stress through precocious life transitions and explore this mediational role, and d) examine the unexplored multiplicative influences of offspring race/ethnicity by relationship status typologies and precocious life events on later mental/physical health outcomes. Specifically, using the life course perspective, family stress/investment models, and cumulative advantage/disadvantage perspectives the current study investigates how growing up in an adverse relationship status (such as single-parenthood, early/late divorced or separated caregivers, and caregivers that transition in and out of marriage-like relationships) influence precocious life events. As such, the current study argues that growing up in these adverse relationship status typologies can be a source of stress that may directly influence youth mental/physical health and premature transitions into adulthood responsibilities (such as early sexual activity and early full-time work).
Data for the current study originated from Waves I (1995), Wave III (2002), and Wave IV (2008) of the Add Health sample (National Longitudinal Study of Adolescent Health). The final sample included 13,134 youth that had complete data on biomarker outcome variables and self-reported depressed mood in order to address research questions. Results of the study revealed that youth that grow up with caregivers that never marry or frequently transition from relationship to relationship directly influence physical health outcomes. Moreover, the results revealed that, with respect to consistently married caregivers, adverse relationship typologies significantly elevated levels of youth depressed mood. Furthermore, adverse relationship status typologies indirectly influenced mental/physical health outcomes through precocious life events. Also, the current study found that experiences from being African-American exacerbated health outcomes/precocious life events whereas experiences from being Hispanic-American or Asian American protected youth from adverse health outcomes/precocious life events. Finally, the current study found that, in general, experiences from being African-American interacted with relationship status typologies to adversely influence mental/physical health outcomes in youth, where being Hispanic/Asian American reduced the effects from adverse relationship status typologies (with respect to Caucasians) on youth mental/physical health outcomes. Overall, findings from the current study demonstrate that transitional and never-married caregivers are the most vulnerable to adverse health outcomes. Also, relationship status typologies that have any change (such as divorce/separation) are most vulnerable to precocious life transitions where stable relationship status typologies (such as growing up with never-married caregivers) are less vulnerable to precocious life events. In general, findings provide evidence in favor of the mediational role of precocious life events. Findings from the current study are then related back to the literature and theoretical perspectives.
CHAPTER 1. INTRODUCTION

One of the most prominent and significant family demographic changes affecting North American primary caregivers today is the increase of single primary caregivers raising children (Avison, 1995; Avison, Ali, & Waters, 2007; Blum, Beuhring, Shew, Bearinger, et al., 2000). Specifically, the rising rates of relationship dissolution and the increase in the number of households in which caregivers never marry are significantly contributing to the vast increase in single primary caregivers raising children (Holden & Smock, 1991; Koball, Moiduddin, Henderson, Goesling, et al., 2010) as well as children being raised in step-parent families (Barrett & Turner, 2005). The traditional nuclear family structure of the mid-twentieth century has evolved to include divorced/separated caregivers, single caregivers, and caregivers that consistently transition between relationships (Koball, Moiduddin, Henderson, Goesling, et al., 2010; Meadows, 2009). Despite the wide body of literature on the influences of the caregiver relationship status on child/adolescent outcomes, little is known how stability and changes in caregiver relationship status over time (hereafter referred to as relationship status history) influence later offspring mental/physical health outcomes. Furthermore, little is known as to whether relationship status history influences youth offspring disrupted life events (as captured by precocious life events) and later offspring mental/physical health outcomes. Moreover, little is known in the current literature how these different relationship status history categories or similar groupings of relationship status histories (hereafter referred to as relationship status typologies) influence later offspring mental/physical health as well as disrupted life events.

Previous research has established the negative association that relationship dissolution has on young-adult health outcomes (Waite, 1995). The past several decades, however, have seen an increase in the number of articles specifically addressing cohabitation, single relationship
status, and divorce (also relationship dissolution) as alternative family forms that influence young-adult mental/physical health outcomes. The reason for the change in focus on alternative family structures has come from a new found shift in the organization and composition of families across the United States. Specifically, 11% of all births in 1970 were to non-married couples (Ventura & Bachrach, 2000). However, by 2003, this figure had increased to 35 percent (Martin, Hamilton, Sutton, Ventura, et al., 2005). Although a great deal of information is known about the adverse consequences of single-parent and divorced/separated relationship statuses on young-adult mental/physical health outcomes (Amato, 1993,2000; Booth & Amato, 2001; Burt, Barnes, Mcgue, & Iacono, 2008), little is known on the differential influences of caregiver relationship status changes over time on youth precocious life events and later mental/physical health. Moreover, there is a substantial gap in the literature regarding the influences of how consistent caregiver transitions in and out of marriage-like relationships influence adolescent precocious/disrupted transitions and later mental/physical health outcomes.

According to the literature, almost half of all children born in the United States will live in a single-parent home for an extended duration before the age of 18 (Amato, 2005; Flewelling & Bauman, 1990; Kobus, 2003; Miller, Benson, & Galbraith, 2001). This change in the family structure can be due to several factors that include early and late divorce in the lives of the young-adult, death of a parent, or the primary caregiver never marrying (Flewelling & Bauman, 1990). In fact, between 1960 and 2007, the number of children growing up in a single-parent family home increased from 8% to 22.5% (United States Census Bureau, 2007). This dramatic shift in children growing up in single-parent families also warrants further investigation on whether extended time growing up in this family structure has adverse influences on precocious transitions and later mental/physical health with respect to consistently married caregivers.
Furthermore, the current literature has documented an ethnic disparity in the proportion of African-American youth growing up in single-parent primary caregivers environments. According to the United States Census Bureau (2007), 53.7 percent of African-American youth grew up in single-parent homes compared to 26.5 percent associated with Hispanic-American youth and 20.5 percent compared to Caucasian youth. Most previous research has focused on the direct influences of race/ethnicity on later health outcomes (Williams & Collins, 2001; Williams, Spencer, & Jackson, 1999) in an effort to document potential racial/ethnic disparities in stress and mental/physical health outcomes. However, no study to date has examined whether race/ethnicity interacts with relationship status history to exacerbate youth precocious life events or later mental/physical health outcomes. Examining this potential multiplicative influence on offspring precocious life events and mental/physical health outcomes could aid in the identification of at-risk youth from adverse relationship typologies (with respect to consistently married caregivers) in order to implement interventions designed to improve positive youth development (Bradshaw, Brown, & Hamilton, 2006).

The current literature involving marriage or change in relationship status over time is sparse. Most studies analyze consistently married couples over time in an effort to understand and evaluate the divorce process on child outcomes (Booth & Amato, 2001; Furstenberg & Teitler, 1994). However, few studies have captured the potential timing effects associated with early and late relationship dissolution in the life of the child (Amato, 2010; Booth & Amato, 2001). Although, the literature on the adverse influences of single-parenthood on childhood outcomes such as mental and physical health is widely available (DeLeire & Kalil, 2002), but no study to date has examined the effects of this status in combination with consistently married caregivers, caregivers that divorce early in the life of the adolescent, caregivers that divorce late
in the life of the adolescent, and caregivers that consistently transition from one partner to the next in one succinct model. Also, no study has addressed how these relationship status typologies influence precocious/disrupted life transitions or mental/physical health outcomes in one succinct model. Most studies treat marital/relationship status as a time-invariant covariate (Elder, Johnson, & Crosnoe, 2003) rather than capturing the potential benefits or disadvantages of marriage or marriage-like relationships over time, the timing of divorce/dissolution, or the effects of frequent transitions in and out of marriage-like relationships (Amato, 2010). As such, a primary objective of the current study is to define and establish relationship status histories over time as captured through relationship status typologies (such as consistently married, never-married, early divorce/dissolution, late divorce/dissolution, and transitional caregivers).

The literature documents that children that grow up in stable environments with two primary caregivers fare far better in terms of physical, emotional, and behavioral outcomes (Amato, 2005; McLanahan & Sandefur, 1994; Sigle-Rushton & McLanahan, 2004). In general, children that are raised in single-parent or step-families tend to reside in more adverse communities, live in poverty, and obtain lower levels of educational and occupational attainment, and have fewer economic/social resources compared to consistently married parents (both biological and adoptive) (Astone & McLanahan, 1991; DeLeire & Kalil, 2002; McLanahan & Sandefur, 1994). Specifically, children growing up with caregivers that dissolve the relationship early/late, never-married, or frequently transition from partner to partner report a higher frequency of disrupted life transitions such as elevated/early substance abuse (Carlson, 2006; DeLeire & Kalil, 2002), early sexual activity and child bearing (Davis & Friel, 2001), leaving the home early (Astone & McLanahan, 1991), marrying at a young age, dropping out of school (McLanahan & Sandefur, 1994), early cohabitation with partners and excessive early
work (Wickrama, Wickrama, & Baltimore, 2010). Previous research has also linked adverse behavioral outcomes with the relationship status of the primary caregiver (Heard, Gorman, & Kapinus, 2008; Kaberege, Modeste, Montgomery, & Fox, 2003). Specifically, family structure is related to involvement in sexual activity and involvement in risky/delinquent behaviors (Blum, Beuhring, Shew, Bearinger, et al., 2000; Kaberege, Modeste, Montgomery, & Fox, 2003). Single or separated primary caregivers may be less involved with their young-adult, have fewer resources available to them, and may experience higher levels of chronic stress thus increasing negative behavioral outcomes (or precocious life events) such as early sexual activity/pregnancy (Velez-Pastrana, Gonzalez-Rodriguez, & Borges-Hernandez, 2005) and delinquent acts (Burt, Barnes, Mcgue, & Iacono, 2008) in youth. However, less is known about young-adults’ physical and mental health consequences of relationship status typologies of primary caregivers.

Precocious or disrupted transitions can impair the normative timing and sequencing of life events (such as entering college on time, marrying at the appropriate age, or entering the work force) (Elder, George, & Shanahan, 1996). As a coping mechanism, youth may rush into adulthood thereby creating chronically stressful life situations from the demands of everyday life (Caspi & Bem, 1990; Elder, George, & Shanahan, 1996; Hatch, 2005). Youth in chronically stressful life situations may not have the coping mechanisms to adapt to this accelerated chronic stress from increased adult and family responsibilities (Wickrama, Wickrama, & Baltimore, 2010). This chronic stress compounds through a dose-response effect (Singh-Manoux, Ferrie, Chandola, & Marmot, 2004) causing harmful/deleterious effects on mental and physical functions (i.e., eroded neurological, cardiovascular, and immunological functioning) (Fremont & Bird, 2000; Lovallo, 2005). Specifically, higher doses of chronic stress from these precocious transitions can increase depressed mood (eroded mental health) (Wickrama & Bryant, 2003),
increase the risk for obesity (higher levels of body mass index) (Volkow, Wang, Telang, Fowler, et al., 2008), and degrade physical health functioning (elevated systolic/diastolic blood pressure, pulse rate, and mean arterial pressure) (Ridker, Cushman, Stampfer, Tracy, et al., 1997). In addition, this rush to adulthood can limit access to financial, emotional, social, and health-related resources (Wickrama, Wickrama, & Baltimore, 2001). A consistent reduction in resources can facilitate chronic stress thereby eroding physical/mental health (such as depression metabolic/cardiovascular functioning) (Pearlin, Scheckman, Fazio, & Meersman, 2005).

The current literature has established the influence of precocious life events on young-adult health (Pearlin Scheckman, Fazio, & Meersman, 2005; Wickrama, Wickrama, & Baltimore, 2010). For example, research has shown that childhood experiences from the parental relationship status history (through timing of dissolution, durations in relationships, and frequent transitions over time) have been linked to the relationship status of offspring (Amato & DeBoer, 2001) documenting a potential intergenerational transmission of relationship status stability. Moreover, little is known as to whether chronically stressful experiences from adverse relationship status typologies of caregivers (such as growing up in single-parenthood or frequent transitions between partners) disrupts transitions of youth resulting in a rush to adulthood in which youth marry or cohabitate in order to cope with chronic stress. As such, the current study will capture proximal processes of stress through adolescent precocious life events.

The dramatic shift in societal trends of the structure of primary caregivers within the United States warrants further investigation. Previous studies have used relationship status as a time invariant covariate or independent variable rather than a dynamic status that changes over time (Afifi, Cox, & Enns, 2006; Elder, Johnson, & Crosnoe, 2003). However, consistent with family stress and investment models, relationship status typologies can work in conjunction with
family-level resources and may have unique influences on young-adult mental/physical health outcomes depending on the level of relationship status typology (Brines & Joyner, 1999; Conger, Elder, Lorenz, et al., 1990; Conger & Conger, 2002; Liker & Elder, 1983). The current study will expand the current literature by assessing how change and stability in relationship status over time, as a resource much like economic pressure, may influence offspring precocious life events and mental/physical health outcomes. Specifically, little is known how stable marriage-like relationships, marriage-like relationships that dissolve both early and late in the life of the young-adult, or caregivers that phase in and out of marriage-like relationships consistently differentially influence physical (such as negative metabolic and cardiovascular symptoms) and mental health (such as depression) outcomes of the young-adult offspring (Amato, 2010; Elder, Johnson, & Crosnoe, 2003; Meadows, McLanahan, & Brooks-Gunn, 2008; 2009). The current study seeks to bridge this gap in the literature.

Relationship status histories can be defined by several criteria including relationship transitions, durations, and the timing of dissolution/divorce (Elder, Johnson, & Crosnoe, 2003). That is, stability and change in the relationship status over time can be captured by using a typology that reflects relationship dissolution timing (early or late relationship dissolution), transitions (consistent or frequent transitions in and out of relationships), and durations (the time spent in a relationship status over time) (Elder, Johnson, & Crosnoe, 2003). For example, primary caregivers may be (a) consistently married, (b) never-married, (c) experience an early divorce/dissolution, (d) experience a late divorce/dissolution, and (e) experience several transitions in and out of marriage-like relationships over time. However, what is missing in the current literature is a study that investigates primary caregivers’ relationship status typology on offspring mental/physical health outcomes through disrupted transitions, while examining
racial/ethnic differences and race/ethnicity by relationship status typology interactions using methods that take community nesting into account (Elder, Johnson, & Crosnoe, 2003). Incorporating community level nesting in my models allows the current study to take into account that families develop within the norms, values, and beliefs of the larger context (Bengston & Allen, 1993).

**Study Objectives**

Based on the gaps in the current literature, the current study identifies several key goals when evaluating the influences of relationship status typologies of caregivers and race/ethnicity on offspring disrupted life transitions and mental/physical health outcomes. The goals of the current study are to a) develop a typology of relationship status dynamics/histories of caregivers, b) investigate the unique influence of caregiver relationship status typologies on young-adult physical and mental health outcomes through disrupted life events (precocious), c) to examine the direct effects of race/ethnicity of the adolescent on youth precocious transitions and mental/physical health outcomes, and d) investigate the moderating effect of race/ethnicity on the relationships between relationship status typologies and young-adult disrupted transitions (precocious life events), relationship status typologies and young-adult physical and mental health outcomes, and young-adult disrupted transitions and physical/mental health outcomes.

**Dissertation Organization**

The current dissertation is organized in a traditional format. This format includes 5 chapters consisting of Chapter 1 (introduction), Chapter 2 (literature review and specific hypotheses), Chapter 3 (methods), Chapter 4 (results), and Chapter 5 (discussion). Chapter 2
will present the current literature, theoretical background, and will present specific study hypotheses. The first half of Chapter 2 will focus on relationship status typologies and health outcomes and the second half will focus on the meditational role of precocious life events. Chapter 3 will provide descriptions of the sample, procedure, measurements, as well as a brief description of the data analysis plan. Chapter 4 will present the results of all conducted analyses for testing hypotheses. Finally, Chapter 5 will provide a discussion of the findings in relation to the relevant literature, conclusion of findings, implications, and limitations.
CHAPTER 2. LITERATURE REVIEW

Relationship Status Typologies: Background, Definitions, and Significance

The work of Shaw and McKay (1932) provided the foundation from which researchers use to guide their explorations into relationship status and young-adult mental/physical health outcomes. For example, Shaw and McKay (1932) found that adolescents from “broken homes” were more at-risk for delinquent behaviors compared to adolescents not from “broken homes.” More recent literature has confirmed these propositions of Shaw and McKay in that adolescents from intact dual-parent families display less delinquent behaviors, fewer depressive symptoms, and greater global health compared to families that are intact (Demuth & Brown, 2004; Elliot, William, Huizinga, Sampson, et al., 1996). The findings of previous research would document the importance of family structure, however few studies have explored relationship status histories of caregivers.

The construct of relationship status typologies is important for several reasons. Primary caregivers that remain consistently married are less likely to experience financial strain, economic pressure, and chronic stress (Avison, Ali, & Waters, 2007; Conger, Ge, Elder, Lorenz, et al., 1994) which can contribute to more of an investment in positive parenting mechanisms and more healthy relationship interactions that sustain the relationship (Martin, Conger, Schofield, Dogan, et al., 2010). For example, Avison and colleagues (2007) compiled data on 518 single primary caregivers and 502 married primary caregivers living in multiple countries. Using both cross-sectional and longitudinal analyses, the authors revealed that never-married caregivers experience higher levels of stress and strain over time with respect to consistently married counter-parts. Furthermore, never-married caregivers are more vulnerable to stress...
resulting in greater health disparities over time with respect to consistently married caregivers (Avison, Ali, & Waters, 2007).

Relationship dissolution has been shown to influence financial strain which can proliferate and exacerbate negative life events across various aspects of daily living (Avison, Ali, & Waters, 2007; Lorenz, Wickrama, Conger, & Elder, 2006; Wickrama, Conger, Lorenz, & Jung, 2008). Consistent adverse family experiences have deleterious effects on a young-adult’s self-worth and sense of control over life events (mastery) (Conger, Ge, Elder, Lorenz, et al., 1994). However, positive home environments (such as that experienced by consistently married caregivers) have been shown to counteract or buffer these negative life experiences (Avison, Ali, & Waters, 2007) in adolescent children/young-adults reducing mental and physical health problems and promoting successful transitions across the life span.

Failing to effectively cope with negative life events/experiences compromises both mental and physical health (such as depression and obesity) (Call, Riedel, & Hein, 2002). As such, divorced/separated caregivers may have fewer resources to invest in teaching the young-adult coping strategies for stress (family investment model) or may lack the social resources associated with marriage to effectively counteract the chronic stressors of a negative home environment through parenting (family stress model). The timing of the divorce/separation may also cause added stress for youth transitioning into adolescence (Elder, Johnson, & Crosnoe, 2003). Similarly, never-married caregivers lack the cumulative benefit of the resources associated with marriage (DeLeire, & Kalil, 2002; McLanahan & Sandefur, 1994; Musick & Bumpass, 2006) resulting in chronic stress exposure and increasing depressive symptoms/health outcomes (obesity, high blood pressure/cholesterol) in young-adult offspring (Cooper, McLanahan, Meadows, McLanahan, & Brooks-Gunn, 2009).
The most prominent argument for assessing relationship status over time involves non-married caregivers’ flow in and out of marriage-like relationships (Carlson, McLanahan, & England, 2004). Carlson and colleagues (2004) analyzed a longitudinal sample of 3,285 not married primary caregivers who reported their relationship status over time (The Fragile Families and Child Wellbeing Study). The authors utilized multinomial logistic regression to examine how and why single primary caregivers transition in and out of marriage-like relationships. Specifically, Carlson and colleagues (2004) demonstrated that women transition in and out of marriage-like relationships due to low supportiveness, low commitment to cohabitation, fathers with alcohol or drug problems, higher conflict in the marriage-like relationship, and physical violence. This type of living situation creates an ever-changing and unstable/unpredictable living environment for children in which the primary caregivers are more focused on their future marriage-like relationship than on the health and well-being of the child (Carlson, McLanahan, & England, 2004). This ever-changing chaotic home environment tends to have few rules and volatile resources which ultimately reduce support and increase chronic stress experienced by children growing up in these families (Carlson, McLanahan, & England, 2004). Marriage-like relationships can result in a sharing of resources between caregivers improving living conditions making these relationships similar to marriage (Musick & Bumpass, 2006; Umberson et al., 1996). However, following the dissolution of these relationships, the reduction in economic and emotional resources available to the caregiver can dramatically reduce living conditions, disrupt offspring on time transitions, and effect health outcomes over time in both the caregiver and the child (Avellar & Smock, 2005). Thus, frequent transitions in and out of marriage-like relationships may create a unique source of stress that may exceed some of the stressors

Currently, there is a gap in the literature on the influences of marriage and divorce (or relationship dissolution) on adolescent disrupted transitions (as is captured by precocious life events). There is a substantial amount of literature on the influences of early/late divorce on adolescent offspring social adjustment (Amato, 2000). Failing to adjust to a marriage-like relationship dissolution, for example, could impair educational attainment, reduce self-esteem/mastery, and increase the likelihood of substance abuse (Amato, 2000; 2005). In a landmark study conducted by Krudek and colleagues (Krudek, Fine, & Sinclair, 1994), the influence of multiple parenting transitions were documented on adolescent health, self-esteem/mastery, well-being, substance use, and peer acceptance. This study found that as the number of relationship transitions increased the level of adjustment decreased, and that the overall educational success dropped with the onset of divorce and the likelihood of dropping out of school increased (or a precocious life event). Moreover, well-being and self-esteem dropped significantly years after the divorce (Krudek, Fine, & Sinclair, 1994). Furthermore, self-reported health was significantly less for adolescents from families that had one or two divorces. This study is highly important in establishing that different relationship typologies of caregivers directly influences offspring health and disrupts transitions by impairing educational attainment and emotional well-being. The current study argues that children from adverse relationship status typologies (i.e., never-married, early/late divorce, and frequent transitions) experience high levels of stress associated with these statuses and may not successfully cope with this chronic stress. This inability to cope impairs adjustment to life events in the short term and disrupts successful transitions into later life sequences/stages (i.e., poor educational performance
in the short term disrupts later educational attainment prompting early excessive work in labor market positions) (Astone & McLanahan, 1991; Booth & Amato, 2001; DeLeire & Kalil, 2002).

**The Theoretical Model**

The current study proposes the theoretical model that is depicted in Figure 1. This model evaluates each relationship status typology as it influences young-adult metabolic, cardiovascular, and mental (depression) health outcomes, respectively. Accordingly, based on the previous literature, consistently married primary caregivers are both the majority of primary caregivers and the least likely to experience a lack in social/financial resources, and are less likely to experience chronically stressful circumstances that result in adverse precocious transitions and mental/physical health outcomes with respect to other relationship status typologies (Amato, 2010; Elder, Johnson, & Crosnoe, 2003). As is shown in Figure 1, the current study will estimate: a) the effect of relationship status typologies on young-adult health outcomes after taking into account community level clustering and all other study variables, b) the direct effects of race/ethnicity on young-adult health outcomes after taking into account relationship status typologies, c) the direct effects of race/ethnicity and relationship status typologies on young-adult precocious life events, d) the mediating and moderating influences of precocious life events on the relationship between relationship status typologies and race/ethnicity on young-adult health outcomes, and e) the interaction effects between relationship status typologies and race/ethnicity on young-adult health outcomes.

*Consistently married caregivers as the reference group.* Figure 1 presents the theoretical model for the current study. This model depicts relationship status typologies as compared to the reference group of consistently married caregivers, and the subsequent unique
influences these typologies have on young-adult precocious life events as well as mental and physical health outcomes. The reference group of consistently married caregivers was chosen for several reasons. First, there is a large body of evidence documenting the accumulation of long term benefits of marriage on health outcomes in both adults and their children (Pearlin, 2010). Second, despite an increase in non-relationship child bearing, the predominant family structure to date is children that grow up in a family structure where caregivers are consistently married (Meadows, McLanahan, & Brooks-Gunn, 2008). Finally, consistently married caregivers tend to experience fewer perceived negative life events (Avison 1995; McLanahan & Sandefur, 1994) and fewer disrupted life events (captured through precocious life events) (Jeynes, 2002; Kurdek, Fine, & Sinclair, 1994) compared with caregivers that are never-married, separated/divorced, or transition from marriage-like relationships (Avison, 1995; Carlson, 2006; McLanahan & Sandefur, 1994). For these reasons, consistently married caregivers and their children will likely experience lower levels of chronic stress attributed to the stable marital status and will have fewer disrupted transitions (Jeynes, 2002; Kurdek, Fine, & Sinclair, 1994) and negative mental/physical health outcomes (Amato, 2010; Kitson & Holmes, 1992; McLanahan, 1983; Pearlin 1999; 2010).

**Theoretical Background**

*The life course perspective.* In order to understand and evaluate individual development over time, we must examine family processes/indicators that may influence development as well as the broader community context. In the life course perspective, family processes serve to pass on the norms, values, and beliefs of the broader community (Bengston & Allen, 1993). Within this perspective, children learn what is expected of them and develop a sequencing of life events
based on the perceived norms regarding their age (Bengston & Allen, 1993). Failing to adhere to
these norms or social roles will create an internal source of stress which can disrupt successful
transitions to the next stage of life (Bengston & Allen, 1993). For example, graduating from
college may have the expectations of finding a job and/or getting married. Failing to adhere to
these norms or expectations may influence the recent graduate into thinking they are a failure or
unsuccessful, ultimately disrupting their next transition into the next stage of life which is
working and/or being a parent. Moreover, adverse transitions at one point in time can adversely
influence subsequent transitions arguing for a proliferation effect where disparities can increase
over time (Dannefer, 2003). For example, children experiencing an early divorce in their life
may disrupt the successful transition into adolescence thereby increasing the likelihood of early
sexual activity/pregnancy (Davis & Friel, 2001), early high school drop-out (Jeynes, 2002);
leaving the home early and excessive work at a young age (Hagan & Wheaton, 1993). These
precocious transitions may negatively influence cognitive processing and emotional
development, or lead to other precocious transitions (Davis & Friel, 2001) all which have
negative health consequences (Wickrama, Conger, Wallace, & Elder, 2003; Wickrama,
Wickrama, & Baltimore, 2010). As a result, the transition into adulthood may also be impaired
arguing for a proliferation effect where cumulative advantages/disadvantages associated with
transitions into stages of life may be compounded (Dannefer, 2003). Thus, human development
is a process where transitions and stages of life may influence development, life events, and
health of children.

Also within this perspective, families are nested in communities and often transmit
greater societal norms and values (Bengston & Allen, 1993). Individuals construct their own
Figure 1. The theoretical model of the current study

Relationship Status Typologies
- Never Married
- Early Divorce/Dissolution
- Late Divorce/Dissolution
- Transitional Relationship Status

Race Ethnicity
- Hispanic American
- African-American
- Native American
- Asian/Pacific Island Amer.
- Other

Precocious Life Events

Physical/Mental Health Outcomes
- Systolic Blood Pressure
- Diastolic Blood Pressure
- Pulse Rate
- Mean Arterial Pressure
- BMI at Wave 4
- Depression (Wave 4)

Note. Consistently married caregivers (relationship status typology) and Caucasians (race/ethnicity) as the reference group
meaning involving what is expected of them through family, social, and community interactions (Bengston & Allen, 1993). Through life experiences, interactions with friends or family transitions may influence individual development (Bengston & Allen, 1993). Moreover, social interactions within the broader community may influence individual development (Bengston & Allen, 1993). For example, social structures such as discrimination and racism may degrade the normative environment (meaning creating an environment where these are acceptable social interactions) (Bengston & Allen, 1993). As such, there is a reciprocal relationship between families and communities as both cause one another and are dependent on historical timing (Bengston & Allen, 1993). The current study does not deny that individuals construct broader meanings from both community and social relationships and as such, structural components of the community can influence both disrupted transitions and health (Leventhal & Brooks-Gunn, 2000; Wilson, 1996). However, this mechanism is beyond the scope of the current evaluation. The current study, however, will control for community level clustering in order to take this potential community into account.

Finally, the life course perspective argues that transitions of one member of the family can influence transitions of other members (Bengston & Allen, 1993). The current study does not deny this intergenerational transmission, but this concept is beyond the scope of the current study as the primary goal is to establish a developmental process in which relationship status typologies of primary caregivers may affect precocious life events (transitions) which, as a proximal process, influence young-adult offspring mental and physical health outcomes. The current study will approximate family processes as exemplified through relationship status typologies and will assess proximal stress processes through youth precocious life events.
Family-level Process Theories in Relation to the Life-course Perspective

Recent literature documents a need to understand marriage as a resource (Amato, 2010). Specifically, I argue for the differential/unique influences of relationship status typologies on young-adult health outcomes, as relationship status typologies may be attributed to different levels of stress and/or available resources associated with relationship status typologies. That is, marriage is a resource for families enabling caregivers differentially invest in children (family investment model). I contend that reduced resources are a consistent source of stress which can have adverse effects on parenting (Conger & Donnellan, 2007) (family stress model). For example, when a dissolution occurs, the level of support may reduce creating excess burden on parents as they no longer have a partner to share in parenting efforts. This dramatically elevates the level of chronic stress for parents which subsequently can increase levels of chronic stress in children (Dawson, 1991). These two models (family stress model and family investment model) in developmental/family research elaborates on the influence of primary caregivers’ stress and family-level resources (economic) as they influence young-adult outcomes including mental/physical health. I will apply the same theoretical argument for the potential influence of stress and resources associated with primary caregivers relationship status over time on young-adult health outcomes, in parallel with stress (family stress model) and resources (family investment model). Thus, in the following sections, I will discuss family stress/investment model in relation to relationship status typologies.

Family stress model on precocious life events and mental/physical health. According to research on family stress model, stress experienced from various aspects of life influence young-adult health outcomes (Benner & Kim; 2010; Gershoff, Aber, Raver, & Lennon, 2007; Yeung, Linver, & Brooks-Gunn, 2002) through caregiver stress processes in relation to available
resources and responsibilities from parenting (Conger & Donnellan, 2007). Family stress model contends that high levels of economic pressure will create feelings of distress (Conger & Donnellan, 2007; Duncan & Magnuson, 2003) in both parents and children (Lorenz, Conger, Montague, 1994; Ross, 2000; Ross & Mirowsky, 2001). Parental feelings of distress experienced consistently over time will negatively influence or disrupt a parent’s ability to communicate, nurture, be involved, or other positive aspects of parenting (Brody & Flor, 1994; Conger, Ge, Elder, Lorenz, et al., 1994, 2002; Formoso, Gonzales, Barrerra, & Dumka, 2007), which may result in negative young-adult emotional (depression), behavioral (early/promiscuity sexual activity, anti-social behavior), and physical (obesity, physical inactivity, and cardiovascular diseases) young-adult outcomes (Taylor, 2006).

Moreover, chronically stressful experiences from homes that are low in resources (Conger & Donnellan, 2007) have been linked to precocious or disrupted transitions in young-adult offspring (Goldscheider & Goldscheider, 1998; Kessler, Berglund, Foster, Saunders, Stang, et al., 1997). For example, when a marriage or marriage-like relationship dissolves the chronic stress experienced from the dramatic shifts in financial/emotional resources can force both the parent and the adolescent offspring to work long hours (Wickrama, Wickrama, & Baltimore, 2010). Furthermore, the increased level of responsibilities (added stress) from a lack in financial resources may limit access to health care, leisure/sports activities, which can subsequently impair later mental and physical health as the offspring develops (Goldscheider & Goldscheider, 1998; Pearlin, Schieman, Fazio, & Meersman, 2005). The increased stress from the relationship dissolution, frequent transitions, or the cumulative disadvantages of remaining a single-parent may limit the availability of the caregiver to meet child needs (Meadows, McLanahan, & Brooks-Gunn, 2008; 2009). Thus, adolescents from adverse relationship status typologies
(never-married, early/late dissolution, and frequent transitions in and out of marriage-like relationships) learn to fend for themselves which may prompt a precocious transition (such as early marriage/cohabitation) (Booth, Rustenbach, & McHale, 2008; Musick & Bumpass, 2006). Therefore, relationship status typologies have an inherent level of stability or cumulative advantage which can function as a unique resource net of the economic resources available to the family. Due to a lack in relationship stability or cumulative benefits, relationship status typologies could potentially disrupt life transitions in youth (Pearlin, Schieman, Fazio, & Meersman, 2005; Wickrama, Merten, & Elder, 2005; Wickrama, Wickrama, & Baltimore, 2009). Precocious life transitions can place added stress on youth and negatively influence later mental and physical health as they may be ill-equipped to deal with chronic stress over time (Hatch, 2005; Maynard, 2005). Thus, I posit that the same theoretical argument for economic resources/pressure are associated and consistent with stability in marriage-like relationships for caregivers; meaning the status of the relationship of caregivers over time functions as a resource is synonymous with economic resources/pressure and can serve as a source of stress.

Economic pressure can be captured through a lack in or loss of income or wealth. When a relationship dissolution occurs, primary caregiver’s experience a reduction in available income increasing the economic pressure experienced (Cooper, McLanahan, Meadows, & Brooks-Gunn, 2009). Over time, the chronic stress from economic pressure and the stressors associated with marriage can impair or disrupt the marriage or marriage-like relationship (Benner & Kim, 2010), result in frequent transitions in and out of marriage-like relationships (Cooper, McLanahan, Meadows, & Brooks-Gunn, 2009), or result in a parent remaining single due to a lack in available male partners in disadvantaged environments (Bradbury & Katz, 2002; Brody, Chen, Murry, Ge, et al., 2006; Cutrona, Russell, Abraham, Gardner, et al., 2003). Caregivers may feel
an added burden to try and meet the needs of their children rather than focusing on positive parenting to improve outcomes for youth (Astone & McLanahan, 1991; Brody & Flor, 1998). For example, because of the shift in resources following a dissolution parents may struggle to provide health care and the ability to provide food, shelter, and clothing (Elder, George, & Shanahan, 1996; Elder, Modell, & Parke, 1993). Conversely, caregivers that have spent some time in a relationship prior to dissolution (i.e., late divorced/separated caregivers) and may be less effected by shifts in resources and stress from the dissolution (Amato, 2010); but youth may experience heighten stressors and strains from the dissolution which may delineate over time (Amato, 2000). Thus, as is posited by the theoretical model in Figure 1, we contend that relationship status typologies reflect differential family stressors similar to economic pressure as is postulated by the family stress model (Conger & Donnellan, 2007; Conger, Ge, Elder, Lorenz, et al., 1994; 2002; Martin, Conger, Schofield, Dogan, et al., 2010; Pearlin, Schieman, Fazio, & Meersman, 2005).

*Family investment model: an alternative model.* Another prominent theoretical model which has documented the effect of family SES on young-adult health outcomes such as depression, obesity, hypertension, and high cholesterol is that of the family investment model (Conger & Donnellan, 2007; Duncan & Magnuson, 2003; Yeung, Linver, & Brooks-Gunn, 2002). Within this model, family-level socioeconomic status affects a family’s access to financial (such as income), social (occupational status), and human capital (such as the level of education) (Bradley & Corwyn, 2002). A family’s access to capital may be a function of the relationship status of caregivers over time and may be a source of stress for caregivers that fail to meet the developmental needs of children (Corcoran & Adams, 1997; Dawson, 1991). A caregivers’ ability to properly invest in these forms of capital may result in positive orderly pro-
social development of the adolescent/young-adult (Becker & Thomas, 1986; Bradley & Corwyn, 2002) which can decrease disrupted transitions (Elder, Johnson, & Crosnoe, 2003) and improve health (Amato, 2005). For example, caregivers with adequate resources will have a greater capacity to invest in developmental outcomes such as educational status which can promote on time development and less stress from being off time (Bengston & Allen, 1993); or in other words reduce disrupted transitions. In contrast, primary caregivers that lack the ability to successfully invest in capital in their children can impede their child’s normative development and adversely influence at-risk behaviors and health (Conger & Conger, 2010; Engle & Black, 2008; Yeung, Linver, & Brooks-Gunn, 2002). Thus, I argue that the family investment model is also applicable and relevant to youth mental/physical health outcomes as different relationship status typologies have varying availability of family-level resources.

However, the scope of family investment model transcends the boundaries of economic principles (Martin, Conger, Schofield, Dogan, et al., 2010). Specifically, research has documented that greater occupational achievement of primary caregivers positively influences their values, beliefs, and goals directly shaping their children’s health/well-being through positive parenting as well as healthy interactions (Hoff, Laursen, & Tardif, 2002; Huston & Aronson, 2005; Kohn, 1969; 1995). Moreover, primary caregivers from higher SES levels are more likely to spend quality time with their spouse/partner and children, adapt behaviors such as communication and warmth to foster well-being in both the parent child relationship and the marital relationship (Martin, Conger, Schofield, Dogan, et al., 2010). Consistently married caregivers, for example, may have more of an ability to invest in the development of effective coping strategies in their children which can buffer the effects of chronic stressors while never-married caregivers may lack this ability to invest in their children (Duncan & Magnuson, 2002).
Caregivers that have few emotional and social resources available to them from being in an adverse relationship status typology focus less on their child’s development in order to buffer chronic stress from life experiences (Brody & Flor, 1997, 1998; Conger & Donnellan, 2007), thus increasing the number of precocious life events and degrading health. Poorer parenting practices may be the result of fewer family resources from being in an adverse relationship status typology and youth experiences from developing in families with poor parenting may experience higher levels of depressed mood, higher BMI, and reduced cardiovascular functioning (i.e., higher systolic/diastolic blood pressure, mean arterial pressure, and pulse rate) (Mistry, Vandewater, Huston, & Mcloyd, 2002). Thus, the current study contends that consistently married/cohabitating caregivers have more of an ability to invest in developmental outcomes with respect to adverse relationship typologies resulting in fewer precocious life events and elevated mental/physical health functioning.

*Cumulative advantage/disadvantage perspective.* Recent literature has documented the benefits and influences, as well as disadvantages, of marriage/relationship stability accumulate over time the longer individuals remain in that status (Amato, 2010; Dannefer, 2003; Lillard & Waite, 1995; Merton, 1988; Ross and Wu, 1996). This is true for both caregivers and their children. The long term cumulative benefit of residing in and transitioning appropriately into a stage in life-course cumulatively builds advantages through benefits (such as social and economic resources, higher mastery/self-esteem, and higher levels of self-worth) (Dannefer, 2003). In particular, youth that spend time developing in an adverse caregiver relationship status typology may have lower levels of accumulated benefits and less of an ability to cope with the stressors from parents, friends, and life experiences (DiPrete & Eirich, 2006). This lack in accumulated benefits for youth from their caregiver’s relationship status typology can exacerbate
chronic stress and prompt precocious life events and reduce mental and physical functioning (Dannefer, 2003; DiPrete & Eirich, 2006). Capturing relationship status over time utilizes this finding in that the relationship itself is a resource which, over time, changes or remains the same resulting in differing levels of accumulated benefits for youth. Depending on the time spent in a particular relationship status typology, youth precocious transitions and mental/physical health outcomes may be different in accordance with the cumulative advantage/disadvantage perspective (Dannefer, 2003).

Based on the cumulative advantage/disadvantage assumptions (CAD) (Dannefer, 2003), widening resource disparities associated with relationship status typologies of caregivers may transmit and compound health inequalities in offspring through the mechanism ascribed to the processes of family stress model and family investment model (Conger & Donnellan, 2007; Duncan & Magnuson, 2003). Early disparities between relationship status typologies in the available social and economical resources proliferate through stress processes in both caregivers and youth across the life span widening the disparity in health outcomes for children later in life (Pearlin, 1999, 2010). For example, early and late divorced/separated caregivers may have a differential level of available resources as higher SES families tend to divorce later in the life of the adolescent (Cooper, McLanahan, Meadows, & Brooks-Gunn, 2009; Lillard & Waite, 1995; Ross and Wu, 1996). As such, disruptions for late divorced caregivers may have less of an effect on later mental/physical health due to the larger resource pool available to the divorced caregivers. Youth developing in with caregivers that divorce later in their life may have more accumulated benefits due to the caregivers remaining together for a longer period of time and may adjust better to the stressors from the divorce/separation in comparison to early divorced/separated caregivers (Amato & Booth, 2001).
As was suggested in the previous paragraph, time spent developing in a relationship status typology may also influence the cumulative advantages associated with a particular relationship status (Pearlin, 1999). After a divorce or separation, the level of accumulated benefits may result in a differential influence of relationship dissolution on an offspring’s health through stress (Kahn & Pearlin, 2006; Merton, 1988; Pearlin, 2010). The strains and stressors associated with the dissolution of a marriage can spillover into various life domains and exacerbate both mental and physical health functioning of the caregiver and the child (Pearlin, 1981; 2010). For example, Meadows and colleagues (2008) analyzed 2,448 primary caregivers using data gathered from the Fragile Families and child Well-Being Study and found that maternal caregivers that transition in and out of marriage-like relationships and never-married mothers demonstrated more adverse global mental and physical health compared with primary caregivers that were consistently married.

Research has shown that the stressors from a lack in accumulated benefits from an adverse relationship status typology can result in a lack in accumulated benefits for children (Dawson, 1991). A lack in accumulated benefits for youth from marriage may chronically strain youth functioning and prompt unsuccessful transitions throughout the life course (Dannefer, 2003) and erode health (Pearling, Schieman, Fazio, & Meersman, 2005). The current study hypothesizes five unique caregiver relationship status typologies to capture offspring accumulated benefits/disadvantages. These typologies are: consistently married, never-married, early divorced/separated in the life of the child, late divorced/separated in the life of the child, and a transitional relationship status where caregivers fluctuate between relationship statuses (here-after referred to as transitional caregivers).
**Dimensions of Relationship Status Typologies**

Currently, there is a gap in the literature on the influences of caregivers that frequently transition from relationship to relationship on youth disrupted transitions and mental/physical health outcomes. Researchers have documented that divorce provides caregivers with an increased opportunity for multiple marriage-like relationships in the future (Wu & Martinson, 1993). Specifically, researchers have documented that children that experience multiple non-biological primary caregivers over time are at an increased risk for adverse mental health problems and a diminished psychological well-being (Amato, 2003). Moreover, the current literature provides evidence that multiple transitions in and out of marriage-like relationships can increase the level of chronic stress while incapacitating an offspring’s ability to adjust to that stress resulting in disrupted life transitions (Amato, 2000).

The review and discussion of current developments of relationship status over time by Amato (2010) proposes 5 dimensions of relationship status histories that could influence young-adult disrupted transitions and mental/physical health outcomes. These dimensions are a) stability, b) duration, c) biological caregivers, and d) the uniqueness of single-parenthood. However, Elder and colleagues (2003) suggest 1 more dimension: the timing of the dissolution.

**A) Stability.** Stability refers to the predictability of the home environment for the young-adult. Relationship statuses that are consistent over time, such as consistently married or never-married, may be marked with fewer conflicts, stable economic resources (regardless of income/SES, meaning even consistently low economic resources is still stable), and caregivers that are consistent in their parenting (whether positive or negative) (Amato, 2010; Manning & Lamb, 2003). As such, the timing of divorce or dissolution may have disparaging influences on young-adult disrupted transitions and mental/physical health outcomes contingent upon the level
of stability present. Moreover, young-adults that experience many transitions in and out of marriage-like relationships from the caregiver may be more prone to conflict, more abuse (physical, mental, emotional, and sexual), ever changing non-biological primary caregivers, and an unpredictable environment that greatly diminishes psychological well-being while increasing the likelihood of mental/physical health problems (Turner, 2005). Adolescents from families with multiple transitions are more prone to maladjustment to daily life thus increasing the likelihood of a disrupted transitions (such as leaving the home early or early high school drop-out) (Jeynes, 2002; Kurdek, Fine, & Sinclair, 1994).

B) Duration. The second dimension of relationship status over time as it influences young-adult disrupted transitions and mental/physical health is the duration of the marriage or marriage-like relationship. As was discussed previously with the cumulative advantage perspective (CAD), the duration spent in a marriage-like relationship will result in cumulative advantages for caregivers and in offspring (Dannefer, 2003). These advantages will reduce stress processes through high level of social and economic resources (through the marriage or marriage-like relationship) while simultaneously improving investments made in children through parenting (family stress models/family investment models) (Conger & Donnellan, 2007; Martin, Conger, Schofield, Dogan, et al., 2010).

Depending on the timing of divorce, the cumulative advantages or benefits of marriage or marriage-like relationship may adversely influence mental and physical health through parenting behaviors and parental stress (Conger & Conger, 2002). Despite the stability associated with the living environment/parental support associated with single-parents, the deficiency in the cumulative benefits of marriage may increase the likelihood of depression and adverse health outcomes due to stresses through economic hardship a single-caregiver experiences in order to
ensure the needs of the child are met (Conger, Ge, Elder, Lorenz, et al., 1994). Moreover, the chronic stressors associated with the lack in resources/support available to single-parents may disrupt life events of offspring as the adolescent may rush to adulthood in order to exit this environment (Caspi & Bem, 1990; Hatch, 2005, Maynard, 1996). Also, caregivers that transition in and out of marriage-like relationships frequently not only lack the cumulative advantages of marriage but also place the added stresses and feelings attached to relationship dissolution on parenting styles and care-taking for offspring (Cooper, McLanahan, Meadows, & Brooks-Gunn, 2009). As such, caregivers with frequent transitions in and out of marriage-like relationships may be more focused on finding new mates or coping with the many changes an unpredictable living environment brings than caring for their child (Cooper, McLanahan, Meadows, & Brooks-Gunn, 2009). Moreover, this type of environment may produce caregivers that are less warm, less available, have fewer communications, and have higher conflicts in the environment (Simons, 1996; Simons et al., 2007). This reduction in parenting behaviors and increased chaotic living environment may lead to disrupted life events such as early high school dropout or excessive work (Jeynes, 2002; Wickrama, Wickrama, & Baltimore, 2010) and adverse health outcomes in young-adults (Simons et al., 1996).

C) Biological care-givers. Amato (2010) argued that a genetic predisposition for biological parents tend to display more positive parenting behaviors toward their child compared with non-biological caregivers (Amato, 2010; Carr & Springer, 2010). For example, Gorman and Braverman (2008) analyzed longitudinal data of 29,420 caregivers and their children from three waves of data using information gathered from the National Health Interview Survey. Gorman and Braverman (2008) used static one-time measures of relationship status to examine the influences of biological/adoptive parents with respect to divorced and single-parents. Based
on the results, the authors found that biologically married parents tend to be closer, display more warmth/affectionate behaviors, are more involved, and tend to be less absent in the life of their child compared to caregivers that transition in and out of marriage frequently.

From a family investment perspective, having two biological caregivers in a marriage-like relationship will dramatically increase the resources invested into the child (Bartlett & Turner, 2005; Martin, Conger, Schofield, Dogan, et al., 2010) subsequently improving physical and mental young-adult health through greater access to health care, higher familial educational attainment, greater access to resources (social, emotional, economical) and more positive parenting (Carr & Springer, 2010; Murray et al., 2002). Early divorced caregivers are more likely to marry at a younger age and reside in tumultuous environments (Hogan & Kitagawa, 1985; South, 2001; Tan & Quinlivan, 2006) compared with late divorced caregivers. As a result, it may be that the presence of the biological father may be significantly diminished in the life of the young-adult for early divorced caregivers compared with late divorced caregivers due to the fusion of the father’s biological attachment and time spent investing in their child’s life. Fewer investments in a young-adult’s life will result in more negative mental and physical health outcomes such as depression, physical inactivity, and obesity (Martin, Conger, Schofield, Dogan, et al., 2010; Meadows, 2009) and greater levels of disrupted life events (Amato, 2000). Assessing the biological relationships of primary caregivers is beyond the scope of the current study, but further exploration is warranted.

D) Single-parenthood. The work of Amato (2010) argues the vulnerabilities associated with single-parenthood could influence young-adult mental/physical health outcomes uniquely. Moreover, single-parenthood may significantly disrupt life events through a consistent lack in resources and parent support leading to a rush to adulthood for youth (Hatch, 2005, Maynard,
Single-parenthood is a consistent and stable environment with respect to early/late divorced parents and the transitional relationship status typologies (Cooper, McLanahan, Meadows, & Brooks-Gunn, 2009) in the fact that this environment is chronically stressful. However, according to the literature, single caregivers lack the presence of a father (in most cases), often live in disadvantaged neighborhoods with fewer available resources and more stressors, fewer economic resources, and have less of an influence on young-adult lives due to an absent caregiver (Leventhal & Brooks-Gunn, 2000; Mistry, Vandewater, Huston, & McLoyd, 2002; Wilson, 1987). This negative environment is consistent regardless of marriage (Amato, 2010). However, research has documented that single-parenthood is consistently stressful for parents and children and could influence young-adult disrupted transitions (Astone & McLanahan, 1991) and negatively impact mental/physical health outcomes (Meadows, McLanahan, & Brooks-Gunn, 2008).

E) Critical periods/timing. Amato, 2010 argues for four dimensions of marriage that can influence young-adult health (stability, duration, biological vs. non-biological caregivers, and single-parenthood). However, the current study argues that critical periods/timing of the separation can also influence young-adult mental/physical health. A critical period is defined as when a divorce or dissolution takes places during a pivotal developmental period in the life of the adolescent (Conroy, Sandel, & Zuckerman, 2010). I contend that relationship dissolution just prior to adolescence could negatively influence young-adult mental/physical health, due to disrupting successful transitions during a ‘critical phase or period’ in development (Conroy, Sandel, & Zuckerman, 2010). A dissolution that occurs during a critical period could disrupt a successful life transition and could lead to precocious life events such as early sexual activity, early pregnancy, early cohabitation, early marriage, early excessive work, early high school
dropout, and leaving the home early (Wickrama, Wickrama, & Baltimore, 2010). Relationship
dissolutions occurring early in an adolescence life may lead to deleterious health effects later in
life through ‘latency effects,’ but successful transitions may not be disrupted (Conroy, Sandel, &
Zuckerman, 2010). The current study establishes that age 10 marks a critical period prior to
entrance into adolescence and will be used to establish the timing of a dissolution (Giedd,

**Relationship Status Typologies and Youth Mental/Physical Health Outcomes**

The following sections will document each typology as it influences young-adult
mental/physical health outcomes with respect to consistently married primary caregivers.

*Never-married care-givers and youth health.* Compared to caregivers that are
consistently married, single caregivers are at an increased likelihood to suffer from psychological
distress and depression (Avison, 1995, 2010; Wherry & Finegold, 2004). Offspring that develop
in a situation where single caregivers are the primary agent for economic, emotional, and health
outcomes can create chronic stress experienced by the caregiver and the child (Avison, 2010;
Kitson & Holmes, 1992). Specifically, elevated levels of stress from a lack in economic
resources and psychological support from partners can negatively affect both mental and
physical health in adults and in children (Lorenz, Wickrama, Conger, & Elder, 2006; Wickrama,
Conger, Lorenz, & Jung, 2008; Wickrama, Conger, Surjadi, & Lorenz, 2010). For example,
research has documented that caregivers that are never-married are more likely to produce
children that engage in at-risk health behaviors such as smoking and early sexual activity
(Bachman, Wasworth, O’Malley, Johnston, et al., 1997; LaVeist, Zeno, & Fesahazion, 2010;
Wood, Goesling, & Avellar, 2007). Also, never-married caregivers tend to not have health

A large body of literature exists documenting the association between the effect of family structure on adolescent/young health outcomes such as obesity, cardiovascular diseases, depression, and hypertension (Blum, Beuhring, Shew, Bearinger, et al., 2000). Blum and colleagues (2000) used data gathered from Wave II of the National Longitudinal Study of Adolescent Health. Blum and colleagues found that young teens that are from single-parent homes are at an increased risk to use substances such as alcohol, tobacco, and other illicit drugs and have lower global health compared to young teens living with two-parent primary caregivers. Similarly, Manning and Lamb (2003) analyzed 13,321 families using data generated from the National Longitudinal Study of Adolescent Health. Using longitudinal analyses, Manning and Lamb (2003) found children from never-married caregivers had substantial mental health disparities compared with children from consistently married caregivers. Specifically, these authors contend that single-parents have a home environment that is not conducive to academic achievement. Stress from failing to achieve impairs psychological well-being prompting overeating and depressive symptoms (Jeynes, 2002; Manning & Lamb, 2003).

In a landmark study by Barrett and Turner (2005), the influence of relationship status and family-level processes were used to predict depressive symptoms in over 1700 adolescents from southern Florida. Using OLS regression, the authors found that single-parent families and step-families significantly predicted depressive symptoms in comparison with in-tact families. Similarly, the cumulative advantages associated with marriage may translate into a more
prominent ability for caregivers to cope with negative life events/stress while providing resources to a child’s development through parenting behaviors and physical resources (Amato, 2000). These investments by consistently married caregivers and an enhanced ability to cope with stressors provide evidence that marriage is a resource which can aid (consistently married caregivers) or impede (never-married caregivers) adolescent mental and physical health.

*Early divorced/separated care-givers and youth health.* Recent literature has documented the benefits and influences of marriage that accumulate over time the longer an individual remains in that status (Lillard & Waite, 1995; Ross and Wu, 1996). The longer a caregiver identifies with a particular relationship status, the more this role becomes a part of their children’s identity (Pearlin, 1999). The longer a caregiver is in this identity, the higher levels of perceived stress experienced by the caregiver after a separation/divorce (Pearlin, 1999, 2010). However, compared with consistently married caregivers, early divorced caregivers tend to be younger, live in more adverse communities, and change residences on a regular basis (Hogan & Kitagawa, 1985; South, 2001; Tan & Quinlivan, 2006). This chaotic living environment combined with less of an ability to cope with these stressors from a lack in the benefits from marriage may increase caregiver stress which can elevate stress levels in children directly and indirectly through impaired parenting (Bruu, DiPiazza, Wang, Puttler, et al., 2009).

The stress associated with a reduction in the available resources (economic, social, emotional) to the family can negatively influence young-adult health outcomes depending on the duration of the marriage and the timing of the separation in the life of the young-adult. Specifically, research has documented that chronic stress experienced by a child prior to transitioning to adolescence can negatively influence that transition, subsequently reducing mental and physical health (Stoep, Weiss, McKnight, Beresford, et al., 2002; Wickrama, Conger,
Lorenz, & Jung, 2008; Wickrama, Conger, Surjadi, & Lorenz, 2010). For example, Chase-Lansdale and colleagues (1995) analyzed the influence of the timing of divorce on adolescent mental health using 17,414 families across a 30-year time span. Children and families were interviewed at ages 1, 7, 11, 16, and 23. The authors found that divorce had an adverse influence on mental health over time, despite the effect dissipating in adulthood. However, if the divorce occurred prior to the transition to adolescence, the child was more likely to have more depressive symptoms that proliferated over the life-course compared to caregivers that divorced after the child transitioned into adolescence/young-adulthood (Chase-Lansdale, Cherlin, & Kiernan, 1995). This study provides evidence that children from early divorce experienced a reduction in resources and a period of stress that can inhibit the transition into adolescence subsequently impairing mental health later in life with respect to late divorced families.

_Late divorced/separated care-givers and youth health._ After a divorce or separation, the level of accumulated benefits and advantages from marriage dictate the negative influences that relationship dissolution has on caregivers (Kahn & Pearlin, 2006; Pearlin, 1999; 2010). The strains and stressors associated with dissolving a long-lasting marriage can spillover into various life domains and exacerbate both mental and physical health functioning of the caregiver and the child immediately following a divorce (Amato, 2000; Cooper, McLanahan, Meadows, & Brooks-Gunn, 2009; Lauritsen, 2003; Meadows, McLanahan, & Brooks-Gunn, 2008). Marriage-like relationships that dissolve early in the child’s life may be prone to more negative outcomes in children due to the lack of cumulative benefits received from the social institution of marriage (Lillard & Waite, 1995; Ross and Wu, 1996) compared with caregivers that dissolve a relationship later in the life of the adolescent (Carr & Springer, 2010; Martin, 2006). Late divorced parents are much older, reside in higher SES communities, and have remained married
long enough for the child to successfully transition into adolescence (Elder, Johnson, & Crosnoe, 2003; South, 2001). Based on the time spent in the marriage or marriage-like relationships, both caregivers accumulated some benefits (such as knowledge, resources, and social support) that they can apply to other aspects of life such as parenting (Bumpass & Lu, 2000; Diprete & Eirich, 2006; Musick & Bumpass, 2006). The stressors of dealing with the changes associated with a divorce/dissolution, however, can erode mental and physical health in young-adults in the short term (Amato, 2000).

The effects of late divorce in the lives of the child may have fewer mental/physical health outcomes for children but more negative implications on health for the adult caregiver (Lillard & Waite, 1995; Pearlin, 2010) with respect to early divorced/separated caregivers. Despite the immediate stress of transitioning out of marriage, the acute influences of divorce/separation late in the life of the adolescent may wane after time as these children still interact with separated parents that are still focused on physical and health outcomes as well as adolescent development (Amato, 2000, 2003; Jeynes, 2002). However, the reduction in available resources can place economic stress on both caregivers; influencing young-adult mental/physical health outcomes through family stress model processes (Conger & Donnellan, 2007; Cooper, McLanahan, Meadows, & Brooks-Gunn, 2009). Adolescents from late divorced/separated parents may have successfully transitioned to adolescence when the family was intact (Amato, 2005). However, these adolescents can still be influenced by the divorce and can still experience adverse mental/physical health outcomes as well as disrupted transitions (such as early sexual activity, early cohabitation, early marriage, early full-time work, or early leaving home) (Amato, 2000). This influence is conceptually and theoretically different than the influence from early divorced caregivers (and with respect to consistently married caregivers) in that the influences may be
more temporary (Amato, 2000). Amato (2000) describes this temporary coping of divorce following a successful transition into adolescence as a *crisis model* where adolescents cope with the stressors of the changed family structure, resources, and home supportive environment but these changes wane over time. On the other hand, the *chronic strain model* which focuses on coping and adjusting to the stressors following a separation that cause a downward spiral of disrupted transitions and eroded mental/physical health from which recovery is more difficult (Amato, 2000). The *chronic strain model* may be more affiliated with early divorce compared to late divorce. Thus, an adolescent may experience heightened depression and weight gain (for example) following a separation, but these effects may dissipate into adulthood as a result of the *crisis model* where teens can attempt to combat the stress from the crisis over time due to the successful transition into adolescence (Amato, 2000) for children from late divorced/separated caregivers. As a result, late divorce/separation may be conceptually and theoretically different in terms of health-related outcomes compared to early divorce/separation.

Research by Chase-Lansdale and colleagues (1995) found that children from late divorced caregivers exhibit fewer depressive symptoms and tend to have relationships with both caregivers despite the separation compared with children that experienced early divorce. However, the nature and benefits of these relationships with caregivers are altered due to the separation because of emotional and resource-based stressors associated with divorce (Chase-Lansdale, Cherlin, & Kiernan, 1995; Cherlin, Chase-Lansdale, & McRae, 1998). Thus, early and late divorced caregivers in the life of the child will negatively influence health outcomes, but the magnitude of the association between early and late divorce may be different due to the timing of divorce (Avison, 1999, 2007, 2010; Cherlin, Chase-Lansdale, & McRae, 1998).
Transitional relationship status and youth health. The transitional relationship status is marked with a chaotic living environment in which caregivers shift in and out of marriage-like relationships. This ever-changing environment is more centrally focused on the caregiver searching for a new mate and obtaining resources rather than being focused on the health and well-being of the young-adult (Yabiku & Gager, 2009). Yabiku and Gager (2009) analyzed 5,902 families using data gathered from the National Survey of Families and Households. These researchers found that caregivers that transition in and out of marriage-like relationships often are searching for alternative partners (both sexual and romantic) while in their current relationship. These authors also found that the transitional relationship status is marked by low barriers to exit. The work of Yabiku and Gager (2009) draw attention to the notion that caregivers that transition in and out of marriage-like relationships may have more sexually permissive attitudes and behaviors where parents focus more on themselves than their children.

Consistently chaotic and stressful environments are marked by poor parenting behaviors and low levels of restriction (least restrictive environment; meaning few rules and interactions) in the home environment (Sprecher, 2002). Poor parenting behaviors can negatively influence young-adult health outcomes through agency/mastery (Pearlin, 2010) in which children are left to fend for themselves and cope with a chaotic environment burdened by conflict and residential instability (Bruu, DiPiazza, Wang, Puttler, et al., 2009). The stresses and strains of coping with such an ever-changing environment ultimately erode mental health and degrades physical health through over eating/physical inactivity in the caregiver and young-adult (Bruu, DiPiazza, Wang, Puttler, et al., 2009; Paczkowski & Galea, 2010). Chaotic environments created by a transitional caregiver may erode relationships that the adolescent/young-adult has with peers, subsequently degrading social support (Windle & Zucker, 2010). Thus, young-adults from transitional
relationship status caregivers may struggle to successfully transition into adolescence and
develop the social supports needed to buffer the chaotic home environment as a result of
previous negative relationships of “rotating” caregivers, subsequently increasing the likelihood
of depression, increased BMI, and reduced cardiovascular functioning (Bruu, DiPiazza, Wang,
Puttler, et al., 2009; Windle & Zucker, 2010).

Physiological Mechanisms Linking Stressful Experiences to Physical/Mental Health

In sum, never-married, early and late divorce, and transitional relationship status
typologies create a chronically stressful environment for young-adults. Recent biomedical
studies directly link chronic stress to negative health outcomes through physiological/biological
processes in the body’s efforts to adapt to stress over time (McEwen, 2004). The influence of
relationship status typologies on youth disrupted transitions and mental/physical health may be
different due to the unique stressors associated with each typology. The following paragraphs
describe how physiological adaptations to chronic stress, in general, influence young-adult
mental/physical health outcomes.

As has been previously stated in the literature review, youth from adverse relationship
status typologies are prone to higher levels of chronic stress through economic pressure and
limited accumulated benefits from negative parenting behaviors (Conger & Donnellan, 2007;
Conger, Ge, Elder, Lorenz, et al., 1994; Duncan & Magnuson, 2003; Lempers, Clark-Lempers,
& Simons, 1989). Children from these stressful environments experience a lack in stable
resources and parental support, which include financial and social resources from the
relationship status as well as learned benefits such as trust/confidence in others (Evans,
Gonnella, Marcynyszyn, Gentile, et al., 2005). This cumulative stress eventually degrades our
The body’s biological response/functioning (McEwen, 2000). The term *allostatic load*, has been ascribed to capture the consequences from the body’s cumulative wear and tear on our body’s functioning in response to chronic exposure to stress and biological mechanisms for adapting to that stress (McEwen, 2000). The chronic stress experienced by the individual from a chaotic/unstable home environment with few resources heightens the neural, immune, and endocrine system (Taylor, 2006). Our bodies seek allostasis or equilibrium despite the heightened change in stress and our body’s systems emit hormones/neurotransmitters to delineate stressful experience in the short term (McEwen, 2000). Long term hormone, neurotransmitter secretion, and heightened system functioning can erode health over time.

In response to chronic stress, the body emits cortisol and epinephrine (adrenaline) to protect the body from stress in the immediate (Taylor, 2006). Also, the body adapts to chronic stress through elevated hormonal activity (sympathetic-adrenal-medullary and hypothalamic pituitary adrenal) to reduce feelings and effects from stress (Matthews & Gallo, 2010). However, constant cortisol and epinephrine secretion, and hormonal activity from chronic stressors of the home/community environment for the young-adult can accelerate disease processes leading to health issues and depressive symptoms (McEwen & Stellar, 1993). The body’s adaptation to chronic stress also creates chemical imbalances in the nervous and immune systems, as well as eroding heart functioning subsequently prompting physical inactivity (Taylor, 2006). Exposure to chronic stress can drain the body of resources leading to feelings of depression (Taylor, 2006). In fact, researchers document exposure to chronic stress can even change brain structures and processes ultimately diminishing the capacity for young-adults to cope with stress (Taylor, 2006) from a chaotic home, having only one caregiver, or disrupted marriage (Amato, 2010) leading to a cycle of degradation in functioning (Pearlin, Schieman,
Fazio, & Meersman, 2005). Finally, exposure to chronic stress can slow down metabolic processes prompting overeating behaviors, physical inactivity, and obesity (McEwan & Stellar, 1993). Slowing down of the metabolic processes also indirectly increases depressive symptoms and prompts cardiovascular disease symptoms such as hypertension and high cholesterol (Taylor, 2006). Thus, stress exposure from the community and home context over time degrades health through physiological responses to psychological stimuli.

**Race/Ethnicity and Youth Health: Direct and Moderating Influences**

The current literature has documented a growing disparity in racial health outcomes across the life span (Williams & Collins, 2001). During the transitional phase of adolescence, emerging health problems can proliferate across the life span (Harris, Gordon-Larsen, Chantala, & Udry (2006)). However, research has shown the improvement of mental health, such as depressive symptoms, as the adolescent/young-adult successfully transitions into adulthood (Harris, Gordon-Larsen, Chantala, & Udry (2006)). Despite the decrease in depressive symptoms, major depressive disorders emerging in adolescence worsen with consistent experiences with chronic exposure to stressful environments (Satcher, 2000). Moreover, the current literature documents more degraded self-reported health from adolescents/young-adults in urban communities compared with rural communities, of which a higher proportion of race/ethnic minorities reside in urban settings (Wickrama, Elder, & Abraham, 2007).

Despite the notion that adolescence is a time of good health, the growing proportion of depression and obesity is alarming (Burt, Barnes, Mcgue, & Iacono, 2008); especially for adolescents that are African-American (Harris, Gordon-Larsen, Chantala, & Udry (2006)). For example, Harris and colleagues (2006) analyzed over 14,000 adolescents across three waves of
data using the National Longitudinal Survey of Adolescent Health. Using logistic regression in
the SEM framework, these authors demonstrated that African-Americans were more likely to be
obese, more physically inactive, as well as have higher levels of substance use. Moreover, the
authors found that Hispanic youth were more likely to smoke cigarettes and not have medical
health insurance compared with other youth (Harris, Gordon-Larsen, Chantala, & Udry (2006).
Similarly, the authors found that Caucasians were more likely to binge drink and abuse alcohol
compared to other minority groups. Studies like these document significant differences between
groups, but other researchers reported mixed findings on differences between ethnic groups after
controlling for individual-level SES (Williams, 2001). However, individual-level SES may not
directly capture structural adversity components that dramatically trigger the stress response
process and degrade health through chronic exposure to stress (Williams & Collins, 2001).

The concept of race/ethnicity implies that individuals associated with a particular race
have a unique social and individual history that differs from the majority group (Taylor &
Turner, 2002; Williams & Harris-Reid, 1999). Specifically, individuals belonging to a minority
group may experience more structural and systematic day-to-day discrimination which may
promote the onset of adverse physical health outcomes (such as high levels of BMI and
cardiovascular disease symptoms) (Brody, Chen, Murry, et al., 2006; Spencer, 2001) and mental
health outcomes (such as high levels of depression) (Brown, 2003). Moreover, certain
race/ethnicities have documented protective factors on health despite potential systematic day-to-
day discrimination experienced (Velez-Pastrana, Gonzalez-Rodriguez, & Borges-Hernandez,
2005; Romero, Robinson, Haydel, Mendoza, et al., 2004). Specifically, ethnicities such as
Hispanic-Americans place more of an emphasis on positive interactions with other Hispanic-
Americans as well with family members (Velez-Pastrana, Gonzalez-Rodriguez, & Borges-
Hernandez, 2005). These interactions may protect Hispanic-Americans from adverse health consequences and may even reduce them (Romero, Robinson, Haydel, Mendoza, et al., 2004). Also, experiences with being of Asian/Pacific Island American background tend to result in individuals experiencing higher educational attainment and higher levels of resources (including health insurance) compared to Caucasians and other racial categories (Sun & Li, 2007). These higher levels of social capital/resources may also protect or reduce adverse health outcomes. Thus, the current study argues for the direct main effects of race/ethnicity on mental and physical health, but these influences may differ depending on racial categories.

Experiences with other racial minority groups may also exert interactive effects with relationship status typologies net of main effects. Research has shown that single-parents are more likely to be African-American compared to other racial/ethnic categories (Fields, 2003). The experiences associated with being African-American may interact with the adverse experiences associated with a relationship status typology to multiplicatively influence later offspring mental/physical health outcomes. Hispanic-Americans place a strong emphasis in their daily life on family unity, togetherness, and tend to be more supportive in those interactions (Velez-Pastrana, Gonzalez-Rodriguez, & Borges-Hernandez, 2005). These family interactions promote marriage, thus the norms/roles associated with being Hispanic-American may protect youth from the adverse consequences from a relationship dissolution (Romero, Robinson, Haydel, Mendoza, et al., 2004). The concept of family unity is also present in Asian/Pacific Island American families, thus these families may be more resilient to marital dissolution and the adverse consequences of a dissolution if one occurs (Chao & Tseng, 2002; Sun & Li, 2007). Thus, the current study argues for potential moderating effects between race/ethnicity and relationship status typologies on later offspring mental/physical health.
The Influence of Precocious Life Events

A key issue in research on adolescence is how this developmental time period influences later pathways and transitions into young-adulthood (Macmillan & Hagan, 2004; Piquero, Brame, Mazerolle, & Haapanen, 2002). Understanding what may prompt early exits out of adolescence and precocious transitions into adulthood is especially important as adverse transitions create negative developmental trajectories (Macmillan & Hagan, 2004) in which the individual-environment interactions are associated with increased conflict/stress (Piquero, Brame, Mazerolle, & Haapanen, 2002, 2005; Sampson & Laub, 1993), proliferated disadvantage (Dannefer, 2003), and later adverse physical and mental health outcomes (Hagan, 1991; Moffitt, 1993; Sampson & Laub, 1993). As such, the current study contends that disrupted life transitions can be captured by precocious life events, where precocious events are proximal processes (or indicators) for stress captured through adverse life experiences/events which can deter mental/physical health outcomes across the life span.

As has been previously established, experiences with the relationship status history of caregivers and systematic discrimination from racial experiences have been linked with various aspects of stressful family experiences within adolescents (Brody, Chen, Murry, Ge, et al., 2006; Spencer, 2001). Another avenue in which these facets of life can influence health is through precocious transitions that some adolescents make as a coping response to chronic stress (Arnett, 2000). Specifically, coping with stress over time may increase the likelihood of adolescents to engage in behaviors or decisions that may prematurely end adolescence and conventional roles/norms therein (Hagan & Wheaton, 1993; Krohn, Lizotte, & Perez, 1997) when adolescents may be ill-equipped to deal with the additional responsibilities of adulthood (Hatch, 2005; Maynard, 1996), resulting in a precocious life event (Wickrama, Wickrama, & Baltimore, 2010).
For example, adolescents from an environment low in emotional and financial resources may seek to drop out of high school and work full-time in order to bring some stability to their life (Hagan & Wheaton, 1993; Jeynes, 2002). However, the added responsibility associated with adulthood (bills, payments, rent, health insurance, etc.) brings a high level of stress adolescents may not be ready for (Wickrama, Wickrama, & Baltimore, 2010). As a result, adolescents can experience prolonged and heightened levels of depression as well as elevated levels of stress which can influence later mental/physical health (Booth, Rustenbach, & McHale, 2008; Fremont & Bird, 2000).

A precocious life event can be defined as an event or role in which an adolescent is placed in and may not be psychologically, physically, cognitively, or emotionally ready for the adult responsibilities associated with the role/event (Baumer & South, 2001; Wickrama, Conger, Wallace, & Elder, 2003). These behavioral choices/decisions, or precocious life events, involve adolescents engaging in early sexual activity (resulting in early pregnancy), prematurely leaving home of origin, dropping out of school, early marriage, early cohabitation, and/or working full-time at a young age (Hagan & Wheaton, 1993). Precocious life events are extremely stressful (proximal process that can be used to capture stress) which can adversely influence adult physical health outcomes (Ge, Conger, & Elder, 2001; Wickrama, Conger, Wallace, & Elder, 2003) and mental health outcomes such as depression and loneliness (Lempers, Clark-Lempers, & Simons, 1989). Thus, as seen in the theoretical model in Figure 1, I contend that precocious life events will influence mental/physical health outcomes and will be influenced by race/ethnicity and relationship status typologies. Adolescent precocious life events may serve as a mediating variable in the relationship between relationship status typologies and mental/health outcomes due to these proximal processes of stress.
**Mediational Role of Precocious Life Events**

*Precocious life events and health.* According to the life course perspective, interactions with others dictate the timing and sequencing of major life events (Bengston & Allen, 1993). For example, social and family-level norms dictate the timing of completing education, getting married, and beginning a family. Individuals who depart from these roles or norms (or normative sequence) disrupt the current transition and future transitions. For example, not completing a high school education can disrupt the successful transition into full-time work or force individuals to cohabitate when they may not be ready to. These departures from the normative sequence can increase stress/depression, which can adversely influence subsequent transitions (Caspi, Elder, & Herbener, 1990; Elder, George, & Shanahan, 1996). Moreover, a disrupted transition may negatively influence health in the short term (such as depressive symptoms) and continue to proliferate negative health outcomes as subsequent transitions are also disrupted (Elder, George, & Shanahan, 1996). Also, to cope with the stressors from family processes/racial discrimination experiences, adolescents may begin to have sexual intercourse at a young age, have an early unplanned pregnancy, and enter a family-level responsibility they may not be prepared for (Baumer & South, 2001; Davis & Friel, 2001).

The stressors associated with being “off-time” in terms of normative sequencing can not only exist in the short term, but also chronically over time (Arnett, 2000). Specifically, the demands and responsibilities associated with entering adulthood prematurely may place adolescents in a situation where they do not have the emotional, social, or financial means to effectively cope with those stressors (Kessler, Berglund, Foster, Saunders, et al., 1997; Maynard, 1996). For example, early pregnancy and being parents at a young age may place a great deal of stress on these individuals as they may struggle to meet their child’s basic needs as well as have
limited support from family and friends (Maynard, 1996; Miller, Benson, Galbraith, 2001). The economic pressure from being young uneducated parents with few resources may negatively influence parenting and promote depressive symptoms/negative health outcomes over time (Conger, Ge, Elder, Lorenz, et al., 1994; Wickrama, Conger, Wallace, & Elder, 2003). Recent studies have shown that early transitions into adulthood come at a time when adolescents are ill-prepared, resulting in elevated levels of chronic stress and adverse health outcomes (Wheaton & Gotlib, 1997; Wickrama & Bryant, 2003). Thus, the current study argues that precocious life events can directly influence adult health as seen in Figure 1.

**Relationship Status Typologies and Precocious Life Events**

The current literature documents the adverse chronic stress experienced from a marital/relationship dissolution may disrupt possible transitions of adolescent children into adulthood depending on timing of divorce/dissolution (Cooper, McLanahan, Meadows, & Brooks-Gunn, 2009). For example, the literature documents that an early divorce may arise due to young mismatched couples from high adverse communities that entered marriage due to teenage pregnancy (Astone & McLanahan, 1991; DeLeire & Kalil, 2002; Hogan, 1991). On the other hand, the stress related to a reduction in parenting and available economic resources following a divorce may also have an influence on precocious life events for more recently dissolved relationships (Cooper, McLanahan, Meadows, & Brooks-Gunn, 2009). However, the literature does document a decrease in the effects following a divorce (Meadows, McLanahan, & Brooks-Gunn, 2008, 2009), which may result in a mild disruption in the transition to adulthood. For example, adolescents may be involved with early sexual activity in an effort to cope with the
stress from a recent divorce of primary caregivers, but recover by adulthood through the establishment of stable relationships with others (Davis & Friel, 2001).

Amato (2010) contends that the stability of the home environment as exemplified by relationship status histories plays an important role in deterring adverse health consequences. As such, consistently married caregivers would demonstrate the least adverse influence on precocious life events. However, never-married caregivers also have a stable home environment (but one that is chronically stressful) (Amato, 2010). The stressors associated with growing up in a single-parent family may result in a cumulative disadvantage associated with unsuccessful transitions into adulthood (Dannefer, 2003; Pearlin, 2010). It may be that adolescents learn to cope more effectively with a chronically stressful environment (Amato, 2010). However, it is also logical to posit that the cumulative benefits of a stable relationship for the primary caregiver may also promote precocious transitions (Dannefer, 2003) as adolescents learn to model a non-normative environment of out-of-wedlock childbearing single-parent primary caregiver (Bandura, 1977). This may result in an intergenerational transmission of precocious life events, or adolescents modeling precocious life events through a degraded home normative environment (DeLeire & Kalil, 2002).

Finally, the chaotic environment that is established through a revolving door of relationship partners may dramatically influence precocious life events (Amato, 2010; Elder, Johnson, & Crosnoe, 2003) through stress processes (Pearlin, 2010). Caregivers that transition in and out of relationship statuses teach adolescents that it is acceptable to be involved with many sexual partners in an effort to relieve parenting and economic stress as well as stressors from daily life (Yabiku & Gager, 2009). The transitional relationship status may be marked by a degraded normative environment where adolescents learn to be involved with early sexual
activity, early marriage/cohabitation, and to focus on egocentric needs over family-level needs (Bruu, DiPiazza, Wang, Puttler, et al., 2009; Sprecher, 2002). Adolescents growing up in transitional relationship status experience higher levels of victimization and chronic stress (Turner, 2005) that may create a vulnerability (or increased likelihood) for precocious life events. Based on a review of the literature, no study to date has assessed each of these relationship status histories on precocious life events (Amato, 2010). Based on the literature, I hypothesize that relationship status typologies will differentially influence precocious life events. Also, I hypothesize that the relationship between relationship status typologies of primary caregivers and adult offspring health will be mediated by offspring precocious life events.

The following sub-sections will address the influence of each relationship status typology on precocious life events.

Never-married care-givers and youth precocious life events. Adolescents growing up in environments with never-married single-parents are at an increased risk of psychological distress due to increased level of responsibility placed on youth from these households (Cooper, McLanahan, Meadows, & Brooks-Gunn, 2009; Mistry, Vandewater, Huston, & McLoyd, 2002). Specifically, adolescents growing up in single-parent families experience higher levels of chronic stress as they are expected to contribute both financially and providing free childcare to other children in the family (Cooper, McLanahan, Meadows, & Brooks-Gunn, 2009; DeLeire & Kalil, 2002; Manning & Lamb, 2003). This increased responsibility can place added stress over time for youth and can negatively influence educational attainment and other disrupted transitions (Manning & Lamb, 2003). A study conducted by Manning and Lamb (2003) using the National Longitudinal Study of Adolescent Health (N = 13,231) found that teens growing up with never-married single mothers are at an increased risk for delinquency, lower grade point average,
higher levels of depression, and lower levels of psychological well-being compared to intact consistently married caregivers. The chronic stress associated with life in this type of family structure, over time, may promote adolescents to leave this environment early in order to reduce the levels of stress experienced (Hatch, 2005; Maynard, 1996) which can influence later disrupted transitions. What is missing in the current literature is a study that addresses whether stability in the home environment counteracts the lack in accumulated benefits from marriage. The current study can address this gap by never-married caregivers to less stable relationship status typologies.

_Early divorced/separated care-givers and youth precocious life events._ Very few studies have specifically documented the effects of the timing of divorce/separation on disrupted life events of adolescents (Manning & Lamb, 2003). Research has shown that the timing of divorce can adversely influence an adolescent’s ability to adjust to life events, educational attainment, and to cope with the stressors these adolescents experience (Amato, 2000; Chase-Lansdale, Cherlin, & Kiernan, 1995). Specifically, research has shown that a divorce/separation prior to the entrance into adolescence can elevate levels of depression (Chase-Lansdale, Cherlin, & Kiernan, 1995) and higher levels of obesity (Wadsworth & Kuh, 1997). Research has also documented that the adjustment to life following a divorce just prior to entrance into adolescence can have profound influences on later educational attainment and occupational status (Krudek, Fine, & Sinclair, 1994). As such, divorce or separation just prior to entrance into adolescence may have unique and profound influences on disrupted life events due to an inability to cope with the chronic stress from this dissolution (Amato, 2000), the dramatic shift in available emotional and financial support from caregivers (Cooper, McLanahan, Meadows, & Brooks-Gunn, 2009), and the increased responsibility to cope with life’s problems with emotionally
absent caregivers (Tan & Quinlivan, 2006). Thus, adolescents may leave home early, drop out of school, or engage in relationships with partners (early sexual activity) in an effort to cope with the stress from an unsuccessful transition into adolescence (Pearlin, Schieman, Fazio, & Meersman, 2005). The stress from being “off-time” or “out of sequence” with others can proliferate or compound into other precocious or disrupted life events, such as early marriage, early cohabitation, and entrance into full-time work during late adolescence (Browning, Burrington, Leventhal, et al., 2008) resulting in greater risks to mental/physical health (Booth, Rustenbach, & McHale, 2008; Wickrama, Merten, & Elder, 2005).

Late divorced/separated caregivers and youth precocious life events. As was posited by Amato (2000), adolescents from late divorce/separation may be experiencing heightened levels of stress following relationship status change of caregivers. The accumulated benefits associated with a longer duration of the primary caregivers being married may provide adolescence with the cognitive capabilities to combat the stressors associated with the dissolution of marriage over time (Amato, 2000; 2005). However, the immediate or acute stress from the parental divorce/dissolution can still potentially impair successful transitions following the divorce (Amato, 2000; Kurdek, Fine, & Sinclair, 1994). For example, following a dissolution, academic performance can decline and later success in post-secondary education can be affected (academic achievement) (Amato, 2000; Engle & Black, 2008; Jeynes, 2002; McLeod & Kaiser, 2004) thus disrupting the sequence and successful transitions of life events. Young-adults that are not successful in college may enter the full-time work force prematurely (Jeynes, 2002). These adolescents are at an increased risk for out-of-wedlock childbearing thus increasing the likelihood of early cohabitation, pregnancy, or marriage (Furstenburg & Teitler, 1994; Hagan & Wheaton, 1993; Jeynes, 2002) which can compound or proliferate perceived stress resulting in
increased level of depression (Pearlin, Schieman, Fazio, & Meersman, 2005), cardiovascular problem (increased systolic and diastolic blood pressure) (Lovallo, 2005), and increased levels of later adulthood obesity (Wadsworth & Kuh, 1997).

*Transitional relationship status and youth precocious life events.* The transitional relationship status typology for primary caregivers is marked by a chaotic home environment with respect to consistently married caregivers and never-married caregivers (Barrett & Turner, 2005). The home environment becomes more chaotic following a divorce/dissolution, but this chaos dissipates and some level of stability is brought to the home environment (Cooper, McLanahan, Meadows, & Brooks-Gunn, 2009). However, caregivers that frequently transition in and out of marriage-like relationships create a home environment that produces a revolving door of resources, caregivers, and household rosters (Yabiku & Gager, 2009). Moreover, caregivers that are frequently transitioning create a least restrictive environment in which adolescents have few rules, low levels of parental support, and must cope with chronic stress using the coping skills available to them (Sprecher, 2002).

Adolescents from this chaotic environment may be ill-equipped to cope with such stressors and are more likely to leave the home early (Goldscheider & Goldscheider, 1998; Hagan & Kitagawa, 1985), work full-time at a young age (Astone & McLanahan, 1991; Wheaton & Gotlib, 1997), drop out of school early (Jeynes, 2002), or are involved in risky behaviors such as early sexual activity (Cavazos-Rehg, Sptznagel, Bucholz, Nurnberger, et al., 2010; Jordahl & Lohman, 2009) increasing the likelihood of early cohabitation, early pregnancy, and early marriage. Caregivers that frequently transition from partner to partner are more focused on finding alternative partners than on supportive parenting, a stable source of economic/financial resources, or creating a stable home environment suitable for successful
transitions for offspring (Yabiku & Gager, 2009). As such, adolescents from these transitioning caregivers may seek to leave the home early, find a stable relationship with a partner, or work full-time in order to create a stable environment (Hatch, 2005). However, the added responsibility associated with living on their own may be a chronic source of stress that increases levels of depression (Booth, Rustenbach, & McHale, 2008) and these adolescents may be ill-equipped to effectively cope with that stress due to the chronically chaotic and stressful developmental environment (Singh-Manoux, Ferr, Chandola, et al., 2004; Yabiku & Gager, 2009). Failing to effectively cope with the chronic stress from the added responsibilities of adulthood can, thus, disrupt later life transitions (Hatch, 2005) resulting in reduced mental/physical health outcomes later in the life-course (Pearlin, Schieman, Fazio, & Meersman, 2008; Wheaton & Gotlib, 1997; Wickrama, Merten, & Elder, 2005).

**Race/ethnicity and Precocious Life Events**

Recent literature has documented that race/ethnicity can directly influence young-adult health (Wickrama & Bryant, 2003) and precocious life events (Wickrama, Merten, & Elder, 2005) independent of community and family-level SES indicators. Race/ethnicity is a vast construct that addresses a history that may not be captured by individual or community level characteristics, such as SES indicators (Williams, Spencer, & Jackson, 1999). The stressors associated with the systematic and day-to-day experiences with race/ethnicity may function as a large source of chronic stress which can lead to low levels of social support through social alienation and a higher risk for precocious transitions such as early sexual activity and dropping out of high school early (Wickrama, Merten, & Elder, 2005). Furthermore, research on minority disparities document that adolescents belonging to a racial/ethnic minority group are at an
increased probability to experience precocious life events such as not completing high school (United Stated Department of Education, National Center for Education Statistics, 2000) and early sexual activity (Cavazos-Rehg, Sptznagel, Bucholz, Nurnberger et al., 2010; Jordahl & Lohman, 2009). For example, Wickrama and colleagues (2005) analyzed over 20,000 adolescents using the Add Health sample to assess the influence of community disadvantage, race/ethnicity, and family adversity on adolescent precocious events and depressive symptoms. The authors found that being Hispanic-American and African-American increased the age at several precocious life event indicators. Thus, I hypothesize that racial/ethnic group inclusion may differentially influence precocious life events.

**Moderating Influence of Race/ethnicity**

*Moderating influence of race/ethnicity by relationship status typologies on health.* The current literature documents that certain racial/ethnic categories may be more likely to be classified in an adverse relationship status typology (Fields, 2003). For example, African-Americans are more likely to experience single-parenthood compared to other ethnicities (Fields, 2003). As a result, the influences associated with being African-American and growing up in a single-parent household may combine (multiplicatively) to influence precocious transitions. Moreover, the relationship between adverse relationship status typologies (such as single-parenthood, early divorce/dissolution, late divorce/dissolution, or transitional caregivers) may be lessened due to affiliation with race/ethnicity. For example, higher available resources (such as financial and social support from the kinship network) for Asian/Pacific Island Americans may reduce the adverse influences from inclusion in an adverse relationship status typology (Sun & Li, 2007; Tseng & Chao, 2002). Furthermore, Hispanic-Americans emphasis on family unity
and togetherness (familismo) may reduce or protect the influence from adverse relationship status typologies on precocious transitions (Velez-Pastrana, Gonzalez-Rodriguez, & Borges-Hernandez, 2005). Thus, race/ethnicity may moderate the association between relationship status typologies and youth precocious transitions.

*Moderating influence of race/ethnicity by precocious life events on health.* One of the most prominent findings in the current literature regarding precocious transitions is the influence of race/ethnicity on the likelihood of a disrupted or precocious life transition (Wickrama, Merten, & Elder, 2005). The chronic stress affiliated with a racial category may compound with precocious life events to influence later global health (Wickrama, Merten, & Elder, 2005). Specifically, Brown (2003) found that there are a number of mental health problems that are affiliated with racial inclusion (notably higher levels of suppressed anger, self-esteem/worth issues, and societal dissociations or detachments). Compared with Caucasians, members of minority groups are less likely to seek out treatment for these internalizing issues (such as seeking treatment for depression) (United States Department of Health and Human Services, 1999). The stress from precocious life events may interact with racial/ethnic affiliation to influence later health (such as depression, BMI, and cardiovascular functioning). However, racial categories such Asian/Pacific Island American (Sun & Li, 2007) and Hispanic-Americans (Velez-Pastrana, Gonzalez-Rodriguez, & Borges-Hernandez, 2005) may protect adolescents from the stressful experiences associated with a precocious transition due to increased level of emotional, social, and financial resources (Romero, Robinson, Haydel, Mendoza, et al., 2004). Thus, I argue that race/ethnicity will moderate the relationship between precocious life events and later mental/physical health.
Marriage Compared to Cohabitation

The current study contends that marriage and marriage-like relationships are more similar than different in terms of offspring precocious transitions and mental/physical health outcomes. For married couples, Cherlin (2000) argues that marriage is a public commitment where witnessing members tend to be more involved in the success of the marriage. This commitment from others internalizes the marital commitment thus making members of the legal union more likely to share resources and time/energy in ensuring offspring development through parenting (England & Farkas, 1986; Musick & Bumpass, 2006). This results in a shared history and increased levels of accumulated benefits (Musick & Bumpass, 2006). However, half of all marriages end in divorce, thus arguing for the delineation of the value in this social institution and associated potential accumulation in benefits in today’s society.

Despite the literature recognizing the benefits of marriage, there is a growing body of literature in which cohabitating caregivers are very similar to marriage in that household members share resources and responsibilities in the development of their children (Waite & Gallagher, 2000). Cohabiting caregivers can establish social roles that are very similar to married couples; thus improving caregiver health, well-being, and reducing chronic stress levels from the relationship status (Waite & Gallagher, 2000). However, cohabitating caregivers lack the legal constraints of marriage and may receive less social support from family and community members (Musick & Bumpass, 2006). Cohabiting couples tend to be less traditional and individualistic, have lower child-bearing, and have less stable environments (Casper & Sayer, 2000). Despite potential differences that have been found, cohabitation may be a way of experiencing the benefits of marriage without the costs, structured roles, and expectations (Musick & Bumpass, 2006). Also, differences between marriage and cohabitation may also be
exaggerated in the current literature due to negative attributions of researchers toward cohabitation and an overstated emphasis on mean-level differences as opposed to trajectory based differences. For example, Musick and Bumpass (2006) found slight differences between cohabitating and married couples on trajectories of well-being and health of caregivers and offspring, and that these differences dissipate over time. Furthermore, the current literature documents that cohabitation and marriage can produce similar developmental outcomes in youth (Brines & Joyner, 1999). Gupta (1999) found that there is little difference between married couples and cohabitating couples in terms of division of household labor, thus the economic pressure experienced may be similar for married couples and cohabitating couples. Thus, though differences between marriage and cohabitation exist, the current study argues that remaining in a consistently stable relationship (either marriage or cohabitation) will reduce youth precocious life events and mental/physical health functioning. As such, marriage and cohabitation are similar constructs specifically in regards to health.

**Control Variables**

Previous research has documented that socioeconomic characteristics can significantly influence youth precocious transitions (O’Rand, 1996) and adverse health outcomes (Wickrama et al., 1995; Wickrama, Wickrama, & Baltimore, 2010). Specifically, research has documented that caregiver income, capital (such as education), and occupational status (Mirowsky & Ross, 2003; O’Rand, 1996) can adversely influence youth offspring mental/physical health. Consistent with family stress model, economic pressure can reduce parenting practices and create chronically high levels of stress in youth resulting in eroded mental health (depression) and physical health (such as cardiovascular and metabolic functioning) (Conger & Donnellan, 2007;
Duncan & Magnuson, 2003; Lempers, Clark-Lempers, & Simons, 1989). Higher levels of family-level resources may reduce chronic stress and allow parents to invest in their children’s social and human capital that may lead to few disrupted life transitions (as captured by precocious life events) (Conger & Donnellan, 2007; Duncan & Magnuson, 2003). The current study will control for the effects of family-level SES indicators on youth mental/physical health and precocious life transitions (thus increasing generalizability). Also, according to attachment theory, youth form strong bonds with female caregivers (with respect to males) that can last for a lifetime (Bowlby, 1969). These attachments can influence the attachments youth form with others (including friends and romantic partners) (Ijzendoorn, 1995). Families in which the father is the primary caregiver may increase chronic stress in youth due to the missing attachment with a mother that is more prominent with respect to fathers. As such, the gender of the parent may significantly predict youth precocious life transitions and mental/physical outcomes. Finally, previous research has documented that the gender of adolescents can also influence later health outcomes (Hankin & Abramson, 1999). Specifically, due to the norms/roles of being female may lead to more stressful experiences which may increase depressed mood (Hankin & Abramson, 1999). The current study will take these potential associations into account.

**Mental/Physical Health Indicators**

The current study argues that relationship status typologies and adolescent race/ethnicity will influence precocious life events and mental/physical health outcomes. The current study will capture three dimensions of mental/physical health. First, little information is known on how relationship status typologies influence different dimensions of cardiovascular functioning. To capture cardiovascular functioning, the current study will use trained-interviewer assessed...
biomarker cardiovascular functioning indicators. According to the literature, these indicators include systolic blood pressure, diastolic blood pressure, pulse rate, and mean arterial pressure (Ridker, Cushman, Stampfer, Tracy, et al., 1997). According to the literature, taking these indicators together can provide a valid estimate of cardiovascular functioning (Ridker, Cushman, Stampfer, Tracy, et al., 1997). Thus, the current study will use trained-interviewer assessments of diastolic/systolic blood pressure, mean arterial pressure, and pulse rate as indicators of cardiovascular functioning. The current literature also has established that BMI (body mass index) has an inverse relationship with metabolic functioning where higher levels in BMI adversely decrease metabolic functioning (Volkow, Wang, Telang, Fowler, et al., 2008). As such, the current study contends that BMI can be used as a general indicator of metabolic functioning. Finally, previous studies have used depressed mood scales, such as the CES-D scale in order to assess general mental health (Wickrama, Merten, & Elder, 2005). The CES-D scale has proven to be a reliable and valid measure of depressed mood and can capture the concept of depressed mood/mental health effectively (Radloff, 1977). Thus, the current study will use an empirically valid measure of depressed mood to capture mental health.

**Specific Study Hypotheses**

Figure 2 presents the operationalized model for the current study. This figure expands on the theoretical model and presents a testable structural equation model in order to address study hypotheses. This model will examine the direct influences of each relationship status typology and race/ethnicity category on precocious life events and later offspring mental/physical health outcomes after controlling for family of origin SES indicators (while taking community level clustering into account). Interaction effects will be assessed through examining outcome
variable models separately to address *hypotheses 6 through 8*. The current study hypothesizes that:

1) Relationship status typologies will influence (significant) young-adult health outcomes compared to consistently married caregivers after controlling for race/ethnicity, family SES indicators, and community level clustering (though this significant influence may be different depending on relationship status typologies). Pathway H1 in Figure 2.

2) Relationship status typologies will influence (significant) precocious life events compared to consistently married caregivers after controlling for race/ethnicity, family SES indicators, and community level clustering (though this significant influence may be different depending on relationship status typologies). Pathway H2 in Figure 2.

3) Race/ethnicity of adolescents will differentially influence (significant) young-adult health outcomes after controlling for all other variables. Specifically, the current study hypothesizes a potential difference between African-Americans and Hispanic/Asian-Americans. Pathway H3 in Figure 2.

4) Race/ethnicity of adolescents will differentially influence (significant) precocious life events after controlling for all other variables. Specifically, the current study hypothesizes a differential influence between African-Americans and Hispanic/Asian-Americans). Pathway H4 in Figure 2.

5) An elevated level in youth precocious life events will positively influence (significant) adverse mental/physical health outcomes after controlling for all other associations. Pathway H5 in Figure 2.

6) There will be a differential association between relationship status typologies on youth mental/physical health depending on race/ethnicity status (moderating effect). Pathway H6 in Figure 2.

7) There will be a differential association between relationship status typology on youth precocious life events depending on race/ethnicity status. Pathway H7 in Figure 2.

8) There will be a differential association between relationship status typology and youth mental/physical health depending on race/ethnicity status. Pathway H6 in Figure 2.
Figure 2. The fully operationalized model addressing study hypotheses

Relationship Status Typologies (Wave 1)
- Never Married
- Early Divorce/Dissolution
- Late Divorce/Dissolution
- Transitional Relationship Status

Race/Ethnicity (Wave 1)
- Hispanic American
- African-American
- Native American
- Asian/Pacific Is. Amer.
- Other

Family SES (Wave 1)
- Parent Income
- Parent Gender
- Parent Education
- Parent Occupation
- General Health Wave 1
- BMI Wave 1 (only for BMI Wave 4)
- Depression Wave 1 (only for Depression Wave 4)

Physical/Mental Health Outcomes (Wave 4)
- Systolic Blood Pressure
- Diastolic Blood Pressure
- Pulse Rate
- Mean Arterial Pressure
- BMI
- Depression

Note: Consistently married caregivers (relationship status typologies) and Caucasians (race/ethnicity) as the reference group
CHAPTER 3. METHODS

Sample

Data for the current study came from Wave 1 (1995), Wave 3 (2002), and Wave 4 (2008) of the National Longitudinal Study of Adolescent Health (Add Health). The primary focus of Add Health is on U. S. adolescents. Specifically, Add Health documents the context in which adolescents live, their lives in general, their general health, and health behaviors. The Add Health uses a school based sampling frame in which 80 high schools were randomly selected from all high school in the United States. In order for a school to be eligible, it must have an 11th grade with at least 30 students enrolled in the school during data collection at Wave 1. Also, schools that included a 7th grade that fed into the selected sample of 80 high schools. The final sample was 134 schools with adolescent participants ranging from 13-19 years of age at Wave 1, 18-26 at Wave 3, 24-32 years of age at Wave 4; the average age of adolescents was 15 at Wave 1, 22 at Wave 3, and 28 at Wave 4. The sample of schools at Wave 1 were stratified based on region, whether the school was urban, rural, or suburban, school type (public, private, parochial), ethnicity, grade span (kindergarten through 12th grade), and curriculum (e.g., vocational, special education, general, alternative, or vocational). Schools varied in total population from 100 students to over 2000 students. Students were then randomly selected from a roster of all students attending the school. The final sample at Wave 1 consisted of 20,745 adolescents from over 2000 different census tracts (or communities). At Wave 3, the final sample consisted of 15,197 participants that had originally participated in Wave 1. At Wave 4, the final sample consisted of 15,010 participants whom had participated at Wave 1. Wave 2, which had 15,753. Data originating from this wave were not included in the current analysis.
The current study utilized in-home interviews for primary caregivers and 1990 U.S. census information. The full sample at the baseline data collection (Wave I) consists of 52.2% Caucasians, 20.1% African-American, 7.0% Asian/Pacific Island American, 3.0% American Indian, 15.7% Hispanic-American, and 2.0% said Other. 96.5% of all caregivers responding in the in home survey were female. For caregivers, 17.3% did not graduate from high school. For caregiver education, 19.8% went to college but never completed their degree while 14.1% of all caregivers obtained their college degree. In term of employment, 56.8% of all caregivers reported having a job while 9.6% of all caregivers documented that they received public assistance such as welfare. In terms of financial assistance, 3.7% of all caregivers reported that they receive a housing subsidy or live in public housing and 24.8% of all families fell below the poverty line. In Terms of biological caregivers, 85% of parents reported being the bio-parent

The current study used 3 waves of data in order to select a final simple. This was accomplished through several stages. First, relationship status typologies were established at Wave 1 as well as demographic variables and race/ethnicity. Second, disrupted life events were established using Waves 3 and 4. Third, biomarker outcome variables were captured at Wave 4 using procedures administered by a trained-interviewer. Finally, participants that had data for all 3 waves were selected. When the waves were combined, there were less than 2% missing data for the biomarker outcome variables and precocious/disrupted life events. In fact, only 256 cases were missing biomarker data due to either a refusal to allow biomarker assessment from a trained-interviewer or reporting errors at Wave 4. However, around 4% of the sample had missing data on relationship status typologies (538 participants) when participants were merged across waves. The final sample for the current study consisted of 13,134 participants that had no missing data on outcome variables (i.e., systolic/diastolic blood pressure, BMI, mean arterial
pressure, pulse rate, and depression) at wave 4. Missing data were assumed to be missing at random (Amato, Landale, & Havasevich-Brooks, 2008) and used FIML to use all available known information for participants to estimate a covariance matrix for those with missing data (Allison, 2002; Booth et al., 2008). An attrition analysis was conducted on control variables for individuals that were removed due to missing biomarker data. The participants that were removed due to missing biomarker data did not significantly differ on the mean-level of control variables with the remaining sample (i.e., there were no differences between those with missing biomarker data on mean-levels of general health, BMI, Depression, parent income, parent education, and parent occupational status at Wave 1). The large sample size of 13,134 participants allows the current study to maximize statistical power, account for community-level clustering, and resolve issues related to the skewness of the study variables (Ba & Zaman, 1998).

An attrition analysis was conducted on the final sample with Wave 1, Wave 3, and Wave 4 data compared to the original attritioned Wave 1 sample in terms of demographic variables, proportions of race/ethnicities, and proportions of relationship status typologies. In order to capture differences between proportions, z-tests were calculated based on the percentage and sample size. In total, there were 7,522 participants that withdrew from the study. First, the proportions of Hispanic-American (Z = 1.56, p > .05), African-American (Z = 1.52, p > .05), Native American (Z = 1.63, p > .05), Asian/Pacific Island American (Z = .24, p > .05), Other (Z = 1.73, p > .05), and Caucasians (Z = 1.46, p > .05) did not differ between those that withdrew from the study. Second, the proportions of consistently married (Z = 1.37, p > .05), never-married or single-parenthood (Z = .99, p > .05), early divorce/dissolution (Z = .41, p > .05), late divorce/dissolution (Z = 1.64, p > .05), and transitional caregivers (Z = .54, p > .05) did not differ between those that withdrew from the study at Wave 1. Third, the proportions of female
caregivers were not significantly different ($Z = 1.32, p > .05$) nor did the proportion of male to female adolescents significantly differ ($Z = 1.26, p > .05$) between the attritioned Wave 1 sample and those that chose to remain in the study across waves. $T$-tests were also conducted on the attritioned sample and the remaining sample for continuous demographic variables. The sample that completed all 3 waves was not significantly different from the attritioned sample in terms of general health ($t = 1.38, p > .05$), depression at wave 1 ($t = .55, p > .05$), self-reported BMI at wave 1 ($t = .26, p > .05$), occupational attainment ($t = -.39, p > .05$), and educational achievement ($t = -1.45, p > .05$). However, those that chose to complete all 3 waves of data collection (outside of Wave 2) were slightly younger at wave 1 compared to the attritioned sample ($t = 6.44, p < .05$) (15.10 on average compared to 15.23 on average). Also, those that chose to complete all 3 waves had primary caregivers that made slightly more income annually ($t = -3.15, p < .05$) (4.40 on average compared to 4.67 on average or $44,000 dollars on average compared to $46,700 on average). Given these findings, the current study argues that the attritioned sample is very similar to the sample that completed all 3 waves of data collection (excluding Wave 2).

**Procedure**

Data for the current study were collected using several methodologies. First, adolescents were interviewed at Waves 1 through 4 using in-home interviews subcontracted by a professionally trained third party organization (RTI International). The Add Health sample consisted of participants across all 50 states. Trained-interviewers entered the home of participants and conducted questionnaires using a computer-assisted personal interview (CAPI) for less sensitive questions and computer-assisted self-interview (CASI) for more sensitive
questions. Interviews took 90 minutes to complete and, following the interview, biological specimens/measurements were collected by the trained-interviewer. The interviewer also assessed information on the home environment and the neighborhood context (immediately surrounding the home). The interviewer was also trained in how to properly assess/measure biomarker indicators such as systolic/diastolic blood pressure, mean artillery pressure, pulse pressure, pulse rate, height, weight, saliva samples, and blood samples. The blood and saliva samples were sent to a contracted third party for analysis (Institute for Behavioral Genetics in Boulder, CO).

**Measures**

**Individual-level Wave 1 Measures**

*Consistently married primary care-givers.* Primary caregivers were asked during the in-home parent interview about their marriage-like relationships. Consistently married primary caregivers were defined as primary caregivers that remain married for the duration of the adolescent’s life through 1995. The in-home interview at Wave I (1995) asked, “Think about your present or recent such relationship (marriage-like relationship). During what years were you married to or living with this person?” Primary caregivers then responded with 0 meaning they were not married to or living with this person or 1 meaning they were married to or living with the person in that particular year. The years that were assessed were 1995, 1994, 1993, 1992, 1991, 1990, 1989, 1988, 1987, 1986, 1985, 1984, 1983, 1982, 1981, 1980, 1979, 1978, and 1977. These years were then summed to create a composite score of years married. The current study utilized this average age to create a dichotomized variable in which primary caregivers that were in marriage-like relationships for greater than or equal to 15 years received a 1 (or
consistently married). A majority of primary caregivers fell into this category and serve as the reference group for the current study’s analyses. Also, for Wave 1, the trained-interviewers assessed a parent (which was preferably the resident mother) using an interviewer-assisted questionnaire. In-school questionnaires and administrator questionnaires from selected schools were also gathered at Wave 1, but were not used in the current analysis.

*Never-married care-givers.* Primary caregivers were asked during the in-home parent interview about their marriage-like relationships. Never-married primary caregivers were defined as primary caregivers that self-identify as never being in a marriage-like relationship for the duration of their child’s life (average age of 15 years) in 1995. The in-home interview at Wave I (1995) asked “The next questions are about your marriages and marriage-like relationships. In the last 18 years, how many such relationships have you had?” Primary caregivers then responded with 0 meaning they were never in a marriage-like relationship, 1 meaning they had been in 1 such relationship, 2 meaning they had been in 2 marriage-like relationships, 3 meaning they had been in 3 marriage-like relationships, 4 meaning they had been in 4 marriage-like relationships, 5 meaning they had been in 5 such relationships, and 6 meaning they had been in 6 or more of such relationships. Primary caregivers that self-identified as having had no marriage-like relationships (0) were deemed never-married primary caregivers. A dummy variable was created in which a 1 reflects a primary caregiver never marrying or involved in marriage-like relationships.

*Early divorced/separated primary care-givers.* Primary caregivers were asked during the in-home parent interview about their marriage like relationships. Early divorced primary caregivers were defined as primary caregivers that separated from the marital union early on in the life of their adolescent (average age of 15 years) 19 years prior to 1995. The in-home
interview at Wave I (1995) asked, “Think about your present or recent such relationship (marriage-like relationship). During what years were you married to or living with this person?” Primary caregivers then responded with 0 meaning they were not married to or living with this person or 1 meaning they were married to or living with the person in that particular year. The years that were assessed were 1995, 1994, 1993, 1992, 1991, 1990, 1989, 1988, 1987, 1986, 1985, 1984, 1983, 1982, 1981, 1980, 1979, 1978, and 1977. These years were then summed to create a composite score of years married. The average age of adolescents in the current study was around 15 years of age. The current study utilized this average age to create a dichotomized variable in which primary caregivers that were in marriage-like relationships for the first 10 years of the adolescent’s life (on average) but then were no longer in this relationship were coded as early divorced or separated. In other words, a composite score of greater than or equal to 10 yielded a score of 1 (or early divorce/separated). The criterion of 10 years was established as the cut off criterion as this marks enough time for the child to develop in a dual-parent structure, but also a critical period in cognitive and physiological development in which divorce may interrupt pre-adolescent and adolescent transitions.

Late divorced/separated primary caregivers. Primary caregivers were asked during the in-home parent interview about their marriage like relationships. Late divorced primary caregivers were defined as primary caregivers that separate from the marital union later on in the life of their adolescent (average age of 15 years) prior to 1995. The in-home interview at Wave I (1995) asked “Think about your present or recent such relationship (marriage-like relationship). During what years were you married to or living with this person?” Primary caregivers then responded with 0 meaning they were not married to or living with this person or 1 meaning they were married to or living with the person in that particular year. The years that were assessed
were 1995, 1994, 1993, 1992, 1991, 1990, 1989, 1988, 1987, 1986, 1985, 1984, 1983, 1982, 1981, 1980, 1979, 1978, and 1977. These years were then summed to create a composite score of years married. The current study utilized the average age of adolescents to create a dichotomized variable in which primary caregivers that were in marriage-like relationships for a majority of the adolescent’s life, but separated or divorced prior to the child reaching adolescence. In other words, a composite score of less than or equal to 9 yielded a score of 1 (or late divorce/separated).

*Transitional relationship status.* Primary caregivers were asked during the in-home parent interview about their marriage-like relationships. Transitional marital status of primary caregivers were defined as primary caregivers that change marital or cohabitating partners multiple time throughout the life span of their child (average age of 15 years) in 1995. The in-home interview at Wave I (1995) asked, “The next questions are about your marriages and marriage-like relationships. In the last 18 years, how many such relationships have you had?” Primary caregivers then responded with 0 meaning they were never in a marriage-like relationship, 1 meaning they had been in 1 such relationship, 2 meaning they had been in 2 marriage-like relationships, 3 meaning they had been in 3 marriage-like relationships, 4 meaning they had been in 4 marriage-like relationships, 5 meaning they had been in 5 such relationships, and 6 meaning they had been in 6 or more of such relationships. The average number of marriage-like relationships for the current study was 1.3 with a standard deviation of .78. Adding the mean to this standard deviation creates a cut-off point in which 3 or more marriage-like relationships were deemed as transitional in nature. Put simply, a dummy code was then created where a 1 was given to primary caregivers that transition between marital statuses and partners.
Race/ethnicity. Adolescents were also asked to report on their race during the in-home interview for Wave I in 1995. The question asked, “What is your race, you may give more than one response?” Primary caregivers were then asked to self-report whether they were 0 or not of a given race, or they marked a 1 which means they were of that race. The specific races in the current study were as follows: White/Caucasian, Hispanic/Latin American, Black/African-American, American Indian/Native American, Asian/Pacific Island American, or Other.

Precocious Life Events Measures at Waves 3 and 4

Precocious life events were assessed from data that originated from both Wave 3 (2002) and Wave 4 (2008) using retrospective data for the purposes of identifying a disrupted transition. When classifying whether an event was precocious, the current study used Wave 3 and Wave 4 ages (calculated by taking the month/year of the study subtracted from the month/year of birth) in order to ensure that all respondents were old enough to potential experience a precocious transition depending on the definition ascribed to each event in the following sub-sections. If respondents were old enough at Wave 3, they were removed from the identification process at Wave 4 in order to eliminate potential reporting bias or errors. Precocious life events were operationalized using U.S. national norm ages and potential life events that may come before the national normative ages (Wickrama, Merten, & Elder, 2005). Specifically, national averages were established for early marriage, early cohabitation, early leaving home, early sexual activity, and early pregnancy. Early full-time work was assessed if adolescents were working full-time while attending high school. However, high school dropout was not established as a precocious life event by using national averages.
Early sexual activity. The Centers for Disease Control and Prevention (1996) established that the average age of first sexual intercourse in the United States was 16 years old for both males and females. The current study utilized a question asked at Wave 3 (2002) which asked, “what was the year and month of first sexual intercourse (defined as vaginal intercourse). This year and month was subtracted from the birth year and month in order to create “age at first sexual intercourse.” If the age at first sexual intercourse was less than 16 years of age, it was classified as early sexual activity (1=early sexual activity, 0=no early sexual activity).

Early cohabitation. A national Gallup Poll (2008) found that half of all 24-year olds today are either residing in the same residence as their partner or married. As such, the age of 24 years of age for cohabitating with their partner was classified as early cohabitation. To assess early cohabitation, the current study used Waves 3 and 4 in order to ensure that the participant had aged enough. At Wave 3, participants were asked to report on their cohabitating sequence in which they first lived with their partner. Specifically, participants were asked “in what month and year did you first begin living with this person (referring to their partner). The cohabitation month/year was then subtracted from the participant’s birth month/year creating a “year at first cohabitation.” If this age was less than 24, then it was classified as early cohabitation. Wave 3 participants were then removed from Wave 4 early cohabitation participant identification in order to avoid reporting bias and the process was repeated using the same question at Wave 4. Wave 4 participants in which their “age at first cohabitation” was less than 24 were then added to the Wave 3 early cohabitation participants.

Early marriage. Using the same Gallup Poll conducted in 2008, marriage before the age of 24 years was classified as “early marriage.” Specifically, retrospective self-reports at Waves 3 and 4 were used to assess early marriage. Participants were asked at Waves 3 and 4, “What was
the year and month of your first marriage to your partner?” The year and month of first marriage was then subtracted from the birth year and month in order to create “age at first marriage.” First, Wave 3 participants were identified in terms of “early marriage” and then these participants were removed from Wave 4 early marriage participant identification in order to avoid reporting bias. The process was repeated using the same question at Wave 4 with the Wave 3 “early marriage” identified participants removed. Wave 4 participants in which their “age at first marriage” is less than 24 were then added to the Wave 3 early marriage participants.

*Early leaving home.* Previous studies have established that the average age an offspring leaves the home is 21 years of age (Kreiter, 2003). In order to capture this, adolescents were asked to self-report their current residential status at Wave 3. Specifically, adolescents were asked: “Where do you live now? That is, where do you stay most often?” Response categories ranged from (1) your parent’s home, (2) another person’s home, (3) own place (apartment, trailer, house, etc.), (4) group quarters (dormitory, barracks, group home, hospital, communal home, prison, penitentiary, etc.), (5) homeless – that is no regular place to stay, or (6) other. Full-time college/university students were removed from the categorization of “early leaving home” due social roles/norms. For Wave 3, the youngest respondent was 19 years of age and the current study used this age as a cut-off point in order to capture leaving home early for adolescents while they were attending high-school/secondary school. Wave 3 asked participants the year and month they moved to this residence. This year and month was subtracted from the participants’ birth year and month thus creating an “age at leaving home variable.” If this age at leaving home was less than 19 years of age, they were classified as “early leaving home.”

*Early pregnancy.* The current study used Wave 3 in order to capture early pregnancy. The youngest participant was 19 years of age in 2002 (Wave 3). Recent studies have used
teenage pregnancy as an indicator of early pregnancy (Wickrama, Wickrama, & Baltimore, 2010) in which the cut-off age to establish this precocious transition is 19 years of age. At Wave 3, adolescents were asked the year and month of first pregnancy (or fathering) for participants. This self-reported year and month were then subtracted from the birth year and month creating an “age at first pregnancy.” If the “age at first pregnancy” variable was less than 19 years of age, then this was classified as “early pregnancy.”

*Early full-time work.* Early full-time work was established using Wave 3 of the Add Health sample. Specifically, adolescents were asked to report on the year and month of their first full-time paying job. This month and year were then subtracted from the participants’ birth year and month creating an “age at first full-time work” variable. If this variable was less than 18 years of age (thus capturing adolescents that work during the high school attending period in their lives) then adolescents were classified as “early full-time work.”

*Early high school dropout.* The current study assessed early high school dropout at Wave 3 of the Add Health study. Specifically, adolescents were asked to report on the highest grade level they had achieved. Adolescents retrospectively self-reporting that they had completed 11th grade or less were classified as having this disrupted transition (“early high school dropout”). Adolescents that had completed high school or an equivalent level of education (G.E.D. for example) were not classified as having dropped out of high school early.

*Precocious life events index.* Scores from precocious life events were then summed in order to create an index of precocious life events where higher scores reflect a higher frequency of precocious life events.

**Outcome Measures Wave 4**
Depressed mood. The current study assessed depressive symptoms using information gathered at Wave 4 (2008) of the in-home interview. Adolescents were asked to self-report their responses on 10 items that assessed depressed mood using the well published CES-D scale, which is a validated scale used to capture depressed moods that are congruent with clinical criterion or statements regarding a diagnosis of depression (Radloff, 1977). The range of responses on these 10 items range from never or rarely (0), sometimes (1), a lot of the time (2), and most of the time (3). Specifically, adolescents were asked; “Now think about the past seven days. How often was each of the following things true during the past seven days?” Following this preface, adolescents were asked to self-report on the following items regarding the past seven days: “You were bothered by things that usually don’t bother you?”, “You could not shake off the blues, even with help from your family and your friends, during the past seven days?”, “You felt you were just as good as other people”, “You had trouble keeping your mind on what you were doing, during the past seven days?”, “You were depressed, during the past seven days?”, “You were too tired to do things, during the past seven days?”, “You felt happy”, “You enjoyed life”, “You were sad, during the past seven days?”, and “You felt that people disliked you, during the past seven days?” Items 3, 7, and 8 were reverse coded. Scores on all responses were then summed. A low summed score indicates low levels of depressive symptoms, and vice versa. The value of Cronbach alpha for this scale was .84. This measure was also assessed at Wave 1 using the same items. The Cronbach alpha value of this scale at Wave 1 was .81. In the analysis, Wave 1 depressed mood will be controlled for when predicting depressed mood at Wave 4.

BMI. BMI (Body Mass Index) was used to assess obesity for adolescents during the in-home interview during Wave 4 (2002). Specifically, the adolescent’s height (in feet/inches) and
weight (in pounds) were assessed by a trained observer. The adolescent’s height and weight were converted into meters using a metric conversion. BMI was then calculated by taking the weight in kilograms divided by the height in meters squared. According to the literature, the gold standard in determining obesity is a BMI greater than 30 (Flegal et al., 2010). Similarly, BMI was assessed at Wave 1. The current study will control for Wave 1 BMI when predicting Wave 4 BMI.

**Systolic blood pressure.** A trained and certified interviewer assessed biological data in a non-clinical setting. Specifically, the trained-interviewer used instrumentation and standard protocols to assess systolic blood pressure as a biomarker at Wave 4. Trained and certified interviewers measured respondents’ resting/seated systolic blood pressures (mmHg) using oscillometric blood pressure monitor. All blood pressure measurements were taken on the right arm. For each respondent, the interviewer administered three separate readings at 30 second intervals. A timer programmed into the computer automated instrument (CAI) which guaranteed the duration of the inter-reading interval. Immediately following each of the three readings, interviewers entered in the measurements. There were no indicators at Wave 1 that directly assessed this variable. Systolic blood pressure was the average of the last two measurements (Entzel, Whitsel, Richardson, Tabor, et al., 2009). The current study used self-reported general health at Wave 1 as a control variable when predicting systolic blood pressure.

**Diastolic blood pressure.** A trained-interviewer used instrumentation and standard protocols to assess diastolic blood pressure as a biomarker at Wave 4. Interviewers measured respondents’ resting/seated diastolic blood pressures (mmHg) using oscillometric blood pressure monitor. All blood pressure measurements were taken on the right arm. For each respondent, the interviewer administered three separate readings at 30 second intervals. A timer programmed
into the computer automated instrument (CAI) which guaranteed the duration of the inter-reading interval. Immediately following each of the three readings, interviewers entered in the measurements. Diastolic blood pressure was an average of the last two measurements (Entzel, Whitsel, Richardson, Tabor, et al., 2009). The current study used self-reported general health at Wave 1 as a control variable when predicting diastolic blood pressure.

Pulse rate. A trained and certified interviewer assessed biological data in a non-clinical setting. Specifically, the trained-interviewer used instrumentation and standard protocols to assess pulse rate as a biomarker at Wave 4. Specifically, pulse rate was the number of heart beats per minute. The current study used self-reported general health at Wave 1 as a control variable when predicting pulse rate.

Mean arterial pressure. A trained and certified interviewer assessed biological data in a non-clinical setting. Specifically, the trained-interviewer used instrumentation and standard protocols to assess mean arterial pressure as a biomarker at Wave 4. Mean arterial pressure assess the contributions of the ventricular systole/diastole by weighting the difference between systolic/diastolic blood pressure measurements. Systolic blood pressure accounts for 1/3 of the value and diastolic pressure accounts for 2/3 of this value. Specifically, it is calculated by 

\[
\frac{((SBP2 + (2*DBP2))/3) + ((SBP3 + (2*DBP3))/3))/2}{(Entzel, Whitsel, Richardson, Tabor, et al., 2009)}. There is no measure of mean arterial pressure at Wave 1. As a result, the current study used self-reported general health at Wave 1 as a control variable when predicting mean arterial pressure.

Community-Level Measures: Wave 1 Contextual Data
Community of origin. The current study utilized community of origin in order to control for community level clustering. The Add Health sample used 1990 US Census data to capture adolescents’ community of origin. Using a community ID number, these communities were then clustered based on this number and taken into account in the current study.

Controls at Wave 1

Primary care-giver income. The current study will use primary caregiver income as an approximation of individual-level SES. As such, this variable will be used in order to examine main and interactive effects after controlling for individual-level SES. Specifically, primary caregivers were asked during the Wave 1 parent interview, “about how much total income, before taxes did your family receive in 1994?” Caregivers then reported their yearly annual income prior to taxes. The annual income was reported in thousands of dollars. The range of responses varied from 0 to 999 (in thousands of dollars). This number was then divided by 10 in order to make estimate coefficients more interpretable.

Primary care-givers’ occupational attainment. Adolescents were asked to self-report their primary caregivers’ occupational attainment during the in-school interview in 1995 (wave 1). Specifically, adolescents were asked: “Which description comes closest to describing their job?” Responses were homemaker (1), professional 1 (doctor, lawyer) (2), professional 2 (teacher, librarian, nurse) (3), manager (executive) (4), technical (5), office worker (6), sales worker (7), restaurant worker (8), craftsperson (9), construction worker (10), mechanic (11), factory worker/laborer (12), transportation (13), military/security (14), farm or fishery worker (15), they don’t work but are disabled (16), and they are disabled and therefore don’t work (17). Responses were then recoded to reflect the occupational status in a condensed variable consisting
of unemployed/disabled (1), employed in the labor market (2), employed in the service sector (3), and employed in a professional position (4).

*Caregiver’s education.* The current study will use primary caregiver education as an approximation of individual-level SES. As such, this variable will be used in order to examine main and interactive effects after controlling for individual-level SES. Specifically, primary caregivers were asked during the Wave 1 parent interview: “how far did you go in school?” The breadth of responses ranged from 8th grade or less (1), more than 8th grade, but did not graduate from high school (2), went to a business, trade, or vocational school instead of high school (3), high school graduate (4), completed GED (5), went to a business, trade or vocational school after high school (6), went to college, but did not graduate (7), graduated from a college or university (8), professional training beyond a 4-year college or university (9), and never went to school (10). The item “never went to school” was recoded to 0, for parsimony with the other items.

*Caregiver/adolescent gender.* During the Wave 1 of the parent interview, primary caregivers were asked to report their gender. Also at Wave 1, trained-interviewers assessed the gender of adolescents (and asked adolescents their gender if needed). A dummy coded variable was then created where 0 = male and 1 = female using this information.

*General health.* Adolescents were asked at Wave 1 (1995) to report on their health in general. Specifically, adolescents were asked, “In general, how is your health? Would you say…” Response categories ranged from 1(excellent), 2(very good), 3(good), 4(fair), 5(poor). This item was reverse coded so higher levels of scores yield higher levels of general health.
Analytic Strategy

Prior to the testing of hypotheses, descriptive statistics were calculated for all of the study measures included in the current study. These descriptive statistics included means, ranges, standard deviations, and skewness. The current study used structural equation modeling (SEM) to evaluate the hypotheses associated with relationship status typologies and race/ethnicity influencing adolescent precocious life events and later mental/physical health outcomes. The current study applied SEM in order to properly assess pathways or mechanisms that predict adolescent health. Figure 3, provides an overview of an example (simple) model where pathways are labeled a, b, and c.

Figure 3. Generic theoretical model to establish SEM equations without controls

Given the above model, the current study will utilized Mplus (Version 6) to estimate unstandardized and standardized beta pathway coefficients (with associate t and p values). As such, the multi-level SEM equations are (adapted from Kline (2005):

1) adolescent health = a*typologies + b*race/ethnicity + c*typologies*race/ethnicity + individual error. Or:

2) adolescent health outcomes = β_1 Typologies + β_2 Race/ethnicity + β_3 Interaction + ε_i.
The TYPE=COMPLEX procedure will take into account community level clustering and associated error. Thus, in the above equations, a $U_{ij}$ error term was added. Each relationship status typology and race/ethnicity category will be assessed uniquely with the reference group being consistently married caregivers subsequently increasing the number of pathway coefficients. Also, the current study will weight coefficients to take into account the over-sampling of minorities (sample weights at Wave 4). This will take the inverse of the selection probability for racial/ethnic categories, and will affect estimates (Muthén & Muthén, 2009).

Given the research questions of the current study, all hypotheses were analyzed using the statistical package MPLUS version 6.0 (Muthén & Muthén, 2009). The current study analyses were conducted using structural equation modeling. Out of all 13,134 participants, some individuals may have had incomplete data for specific items (specifically for precocious life events). There were very little missing data on outcome variables for Wave 4 due to a trained-interviewer assessing biomarker data. However, there were some missing data that were removed from the analysis. There were also no missing data on race/ethnicity. There was around 4% of the sample that had missing data on relationship status typologies. Around 5% of the sample had missing data on one or more indicators of precocious life events. However, after summing, around 2% of the sample had missing data on precocious life events index (259 participants). The missing data program in MPLUS version 6.0 is to use FIML (full-information maximum likelihood) to use all available known information for participants to estimate a covariance matrix for those with missing data (Allison, 2002; Booth et al., 2008) on independent variables only. Observations with missing mental/physical health outcomes were removed from the analysis in order to avoid a Type 1 error (around 2% of the final sample). This method allows researchers to use all available data in the analysis to estimate missing values and has
been shown to provide efficient estimates of parameters (Allison, 2002; Enders, & Bandalos, 2001) for missing at random data (Amato, Landale, Havasevich-Brooks, 2008).

The current analysis utilized the TYPE=COMPLEX (Muthén & Muthén, 2009) procedure in order to take into account community level clustering as well as the weights associated with probability of selection for racial/ethnic categories. A complex sampling such as is employed by Add Health may produce biased standard error estimates in the analysis. The TYPE=COMPLEX procedure in MPLUS will take that potential bias into account (Muthén & Muthén, 2009). Failing to take clustering into account can underestimate standard error values needed for significance tests which can thus inflate Type I errors (rejecting the null hypothesis when in reality no significant difference exists) (Johnson & Elliot, 1998).

To evaluate model fit, standard estimation procedures for the Chi-square statistic for TYPE=COMPLEX do not apply. In order to estimate the appropriate fit statistic, MPLUS version 6.0 uses a Satorra-Bentler chi-square test statistic (a maximum likelihood parameter that estimates standard errors and a mean-adjusted chi-square statistic that is robust to non-normality and non-independence of observations (Muthén & Muthén, 2009) using the COMPLEX procedure in MPLUS. This chi-square value provides a closer fit between the sample variance-covariance matrix and the estimated model. However, due to the inflated sample size in the current study, alternative fit indices such as the Comparative Fit Index (CFI), the Root Mean Square Error of Approximation (RMSEA), and the Standardized Root Mean Square Residual (SRMR) were also calculated. Research has documented that a CFI value of greater than or equal to .95 indicates a good overall fit between the estimated model and observed data (Hu & Bentler, 1999). A RMSEA and SRMR value of less than .05 also indicates a good fit for the estimated model to the observed data (Byrne, 1998). The TYPE=COMPLEX procedure was
used to estimate four structural equation models for each outcome variable (six outcome variable times 3 models = 18 models) to address study main effects and meditational effects of precocious life events. Model 1 evaluated the direct effects of relationship status typologies on the target health outcome after controlling for all other associations. Model 2 added the direct influence of race/ethnicity. Model 3 added in the meditational influences of precocious life events on the target health outcome. This model also included the direct influences of race/ethnicity and relationship status typologies on precocious life events.

The TYPE=COMPLEX procedure was also used to address the full model which included all outcome variables. Finally, the robust chi-square and associated degrees of freedom for the full model was compared to three reduced models in order to uncover the most parsimonious model for the current study. Traditional chi-square difference tests cannot be applied to the robust chi-square estimates as the difference between two robust chi-squares is not distributed as a chi-square statistic (Muthén & Muthén, 2009). In order to address significance between two robust models, the current study applied the TRd formula (obtained from www.statmodel.com). This formula is:

$$CD = (D_0 * C_0 - D_1 * C_1) / (D_0 - D_1)$$

And $$TR_d = (T_0 * C_0 - T_1 * C_1) / CD$$ from above.

Where, $$T_0$$ and $$T_1$$ are the regular maximum likelihood chi-square values for model 1 and model 2 (the maximum likelihood chi-square is equal to the scale/robust chi-square times the scaling correction factor), $$d_0$$ and $$d_1$$ are the degrees of freedom associated with model 1 and 2, and $$c_0$$ and $$c_1$$ are the scaling correction factors for model 1 and model 2 (Satorra, 2000). CD is the difference test scaling correction. The degrees of freedom of the difference are equal to the proposed model minus the full model.
Moderations for the current study were also assessed using the TYPE=COMPLEX procedure in MPLUS version 6.0. Moderations were assessed net of main effects and were computed by multiplying race/ethnicity by relationship status typologies and race/ethnicity by precocious life events. This consisted of 6 interaction model for health outcomes (net of main effects) and 1 interaction model for the influence of race/ethnicity by precocious life events on health net of main effects.
CHAPTER 4. RESULTS

Based on the current study hypotheses and the data analysis plan described in Chapter 3, the following chapter will present the results of all analyses conducted. First descriptive statistics, demographic percentages, and the zero-order correlation matrix will be presented for study variables. Second, the nested structural equation models will be presented for each outcome variable separately in order to document possible mediation effects. Third, the operationalized model will be presented and compared to reduced models (theoretically driven). Finally, the moderating effects of race/ethnicity by relationship status typologies and precocious life events will be presented.

Descriptive Statistics, Demographics, and Zero-order Correlations

An overview of demographic percentages from the final sample can be seen in Table 1. From the final sample of 13,134 participants, 51% of adolescents were female and 49% were male. In terms of race/ethnicity, 51.7% of the final sample was Caucasian, 16.4% were Hispanic-American, 19.7% were African-American, 3.2% were Native American, 7.0% were Asian/Pacific Island American, and 2% were Other. The current study took the sample weights into account when estimating parameters (due to over-sampling of ethnic minorities). This was done by taking the inverse of the inclusion probability using the weight function in MPLUS version 6.0. In total, 96% of the caregivers reporting in the final sample were female. For relationship status typologies, 52.9% of the final sample had caregivers that were consistently married, 4.3% were classified as never-married or single-parent, 15.2% were classified as early divorce/dissolution, 21.1% were classified as late divorce/dissolution, and 6.4% were classified in the transitional relationship status typology. Given the high proportion of consistently married caregivers compared to all other relationship status typologies, they were the reference group in
the creation of dummy coded variables. Moreover, after taking the sample weights into account, the Caucasian ethnicity was the reference group in the creation of dummy codes concerning race/ethnic categories. In terms of precocious life events, 31.2% of youth had no precocious life events, 28.7% of youth had 1 precocious life event, 19% of youth had 2 precocious life events, 12% of youth experienced 3 precocious life events, 6% of youth experienced 4 precocious life events, 2.3% of youth experienced 5 precocious life events, .6% of youth experienced 6 precocious life events, and less than .1% of youth experienced 7 precocious life events. The results of descriptive analyses also revealed that precocious life events co-occurred with one another. 48.9% of youth that experienced cohabitation also self-reported leaving the home early. 70% of youth that dropped out of high school early reported early work. 40% of married youth reported leaving the home early, and around 17% of all youth that reported early sexual activity reported early pregnancy, 28% reported early marriage, and 51% reported early cohabitation.

Table 2a presents the descriptive statistics for the control variables at Wave 1. There were some missing data for each variable. Parental occupational attainment and Parental education had the highest percentage of missing data. General health had a mean of 3.12 and a standard deviation equal to .71. This variable was normally distributed as a result of the skewness statistic. Depression had a Mean of 6.87 and a standard deviation equal to 4.79. This variable was slightly skewed to the right which is to be expected given most people report low levels of depressed mood. BMI had a mean equal to 23.57 and a standard deviation equal to 5.27. This variable is also skewed and which is to be expected given the increase in number of obese adults in the last 30 years (Flegal, Carroll, Ogden, & Curtin, 2010). Parent income at Wave 1 is also highly skewed (with a mean of 4.67 and a standard deviation equal to 5.25). This is a common finding across studies. Occupational attainment had a mean equal to 4.18 and a
standard deviation equal to 4.18. This variable was also skewed to the right suggesting most parents work as professionals or in administration. This is also to be expected given the mean income of 46,700 dollars. Parental education had a mean of 5.48 and was slightly skewed. Finally, the adolescent’s mean age equaled 28.79 and had a standard deviation equal to 1.21. This variable was normally distributed.

Table 2b presents the descriptive statistics for outcome variables at Wave 4. There was no missing data for outcome variables and 526 participants had missing data on precocious life events after summing each individual indicator (precocious life events index). The mean of the precocious life events index was 1.42 with a standard deviation equal to .63. This variable was slightly skewed to the left. BMI had a mean of 29.12 and a standard deviation equal to 7.42. This variable was also skewed slightly. Systolic blood pressure (mean = 124.47, standard deviation = 13.61), diastolic blood pressure (mean = 79.04, standard deviation = 10.19), pulse rate (mean = 74.18, standard deviation = 11.83) and mean arterial pressure (mean = 94.19, standard deviation = 10.69) were also slightly skewed. Finally, Depression at Wave 4 had a mean equal to 6.14 and a standard deviation equal to 4.69. This variable is also skewed which is to be expected. The variables for the current study are slightly skewed given the cutoff criterion established by statisticians (Ba & Zaman, 1998). However, given the very large sample size of the current study, the effect of violating the skewness assumption on parameter estimates will be reduced substantially in magnitude having virtually no effect on an *n*id distribution (normally and independently distributed) (Ba & Zaman, 1998). The current study attempted various transformation to obtain normal distributed outcome variables (i.e., log transformation, square root transformations, etc.). The transformations failed to bring the skewness parameters within acceptable plus or minus two range (Ba & Zaman, 1998).
Table 3 presents the zero-order correlations for the current study. Important correlations to note are that never-married \((r = .09, p < .05)\), early divorce/dissolution \((r = .11, p < .05)\), late divorce/dissolution \((r = .09, p < .05)\), and transitional caregivers \((r = .12, p < .05)\) significantly correlate with later precocious life events in the positive direction. Also, race/ethnic categories such as being Hispanic-American \((r = -.02, p < .05)\), African-American \((r = .07, p < .05)\), Native American \((r = .02, p < .05)\), and Asian/Pacific Island American \((r = -.06, p < .05)\) significantly correlates with precocious life events in the correct direction. However, the racial/ethnic category of other failed to significantly correlate with precocious life events.

In general, relationship status typologies exerted few significant correlations with biomarker outcomes. Never-married caregivers significantly correlated with systolic blood pressure \((r = .03, p < .05)\), diastolic blood pressure \((r = .03, p < .05)\), pulse rate \((r = .03, p < .05)\), and mean arterial pressure \((r = .02, p < .05)\). Early divorce significantly correlated with later pulse rate \((r = .02, p < .05)\) and the transitional relationship status typology significantly correlated with pulse rate \((r = .02, p < .05)\). In general, racial/ethnic categories significantly correlated with biomarker outcomes. Specifically, being Hispanic-American negatively correlated with systolic blood pressure \((r = -.03, p < .05)\), diastolic blood pressure \((r = -.03, p < .05)\), and mean arterial pressure \((r = -.03, p < .05)\). The Asian/Pacific Island American racial category also negative correlated with diastolic blood pressure \((r = -.02, p < .05)\) and pulse rate \((r = -.03, p < .05)\). However, being African-American positively correlated with systolic blood pressure \((r = .04, p < .05)\), diastolic blood pressure \((r = .03, p < .05)\) and mean arterial pressure \((r = .03, p < .05)\). Native American race/ethnicity was positively correlated with systolic blood pressure \((r = .02, p < .05)\), diastolic blood pressure \((r = .02, p < .05)\), and mean arterial pressure \((r = .03, p < .05)\). Also, it is important to note that relationship status typologies and racial
ethnic categories significantly correlated with depressed mood and BMI in the correct direction. Specifically, all relationship status typologies positively correlated with depressed mood ($r$ ranging in magnitude between .02 and .06, $p < .05$). Also, only Asian/Pacific Island American failed to significantly correlate with depressed mood (all other Pearson $r$ statistics range from .03 to .07, $p < .05$). Moreover, Asian/Pacific Island American ($r = -.06, p < .05$), and Hispanic-Americans negatively correlated with BMI ($r = -.05, p < .05$) while all other racial categories positively correlated with depressed mood and BMI ($r$ ranging from .03 to .10, $p < .05$).

In general, the outcome variables were all significantly correlated in the correct direction. Important correlations to note is the mean arterial pressure is highly correlated with systolic and diastolic blood pressure ($r$ ranged from .71 to .76, $p < .05$). Also, systolic and diastolic blood pressure is highly correlated ($r = .78, p < .05$). The remaining correlations that are significant range from .02 to .32 in terms of outcome variables. Also of importance is that the precocious life events index correlates with all outcome measurements. Specifically, precocious life events significantly correlates with systolic blood pressure ($r = .12, p < .05$), diastolic blood pressure ($r = .11, p < .05$), pulse rate ($r = .08, p < .05$), mean arterial pressure ($r = .09, p < .05$), depression ($r = .13, p < .05$), and BMI ($r = .15, p < .05$).

Table 4 presents the correlations for the control variables at wave 1 with outcome variables at wave 4. In general, control variables correlate with outcome variables in the correct direction. Specifically, general health negatively correlates with all wave 4 outcome variables in the correct direction ($r$ ranges from -.02 to -.11). BMI at wave 1 significantly correlates with BMI at wave 4 ($r = .37, p < .05$). Depression at wave 1 significantly correlates with depression at Wave 4 ($r = .25, p < .05$). In general, adolescent gender negatively correlates with physical health outcomes ($r$ ranged from -.13 to -.20, $p < .01$) and positively correlated with depression ($r$
= .05, p < .01). Also, in general, parental education, occupational status, income, and gender all negatively correlated with health outcomes (r ranged from -.02 to -.11, p < .05).

Testing Direct Effects and the Meditational Role of Precocious Life Events

In order to evaluate direct effects of relationship status typologies and race/ethnicity and the meditational effects of precocious life events (as well as the direct effects of relationship status typologies and race/ethnicity on precocious life events) 3 models must be fit to address study hypotheses. Model 1 will evaluate the direct effects of relationship status typologies on the target health outcome after controlling for control variables. Model 2 will add the direct influence of race/ethnicity. Model 3 will add in the meditational influences of precocious life events on the systolic blood pressure. This model will also include the direct influences of race/ethnicity and relationship status typologies on precocious life events.

Systolic Blood Pressure

The results of the estimates of relationship status typologies on systolic blood pressure after controlling for general health at Wave 1, parental income, occupational attainment, parental education, and parent gender can be seen in Figure 4. First, never-married caregivers significantly predicted systolic blood pressure at Wave 4 (β = .03, t = 2.90). This finding can be interpreted as a one standard deviation unit increase in never-married (consistently married compared to never-married care-givers) results in a .03 standard deviation unit elevated level in systolic blood pressure. Due to the dichotomized distribution, an unstandardized estimate may
Table 1. *Sample Demographics (Unweighted in Order to Reflect Sample Size N = 13,134)*

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Table 2a. *Descriptive Statistics for Control Variables at Wave 1*

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Table 2b. *Descriptive Statistics for Outcome Variables at Wave 4*

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Note. a<.01, b<.05, Never = never-married, Early = early divorce, Late = late divorce, Trans. = Transitional caregivers, Hisp.= Hispanic, Nativ = Native American, Prco = precocious life events, SBP = systolic blood pressure, DBP = diastolic blood pressure, PIRte = pulse rate, MAP = mean arterial pressure, Dpress = depression
Table 4. Correlations of Wave 1 Controls, Precocious Life Events and Health Outcomes

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<td>-.04^a</td>
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</table>

Note. a<.01, b<.05. A.Gender = adolescent gender (male), Genhlt = general health, Dep1 = depression 1, Pincome = parent income, PGender = parent gender (male), POccu = Parent occupational status, Pedu = parent education, Prococ = precocious life events, SBP = systolic blood pressure, DBP = diastolic blood pressure, PIRte = pulse rate, MAP = mean arterial pressure, Dpress = depression, BMI1 = BMI at Wave 1, BMI4 = BMI at wave 4
be more interpretable. This estimate equals 1.98, meaning caregivers that never marry compared to caregivers that are consistently married experience a 1.98 unit elevated level in systolic blood pressure. Parental income ($\beta = -.04$, $b = -10.07$, $t = 2.90$), parent gender ($\beta = -.03$, $b = -1.74$, $t = 2.90$), and adolescent gender ($\beta = -.20$, $b = -5.47$, $t = -20.99$) also negatively influence systolic blood pressure. The $r^2$ of systolic blood pressure was .044.

The estimates of relationship status typologies and race/ethnicity on systolic blood pressure after taking into account control variables can be seen in Figure 5. The results document that never-married caregivers significantly predicted systolic blood pressure after controlling for family demographics, general health, and race/ethnicity ($\beta = .03$, $b = 1.63$, $t = 2.90$). Also, Hispanic-Americans ($\beta = -.04$, $b = -1.48$, $t = -3.35$) documented a significant reduction in the level of systolic blood pressure while the results revealed that African-Americans experienced a significant elevated level in systolic blood pressure ($\beta = .03$, $b = .76$, $t = 2.43$) after controlling for relationship typologies, influences from other race/ethnicities, and family demographics. Parental income ($\beta = -.04$, $b = -9.59$, $t = -2.87$), parental gender ($\beta = -.03$, $b = -1.78$, $t = -3.17$), and adolescent gender ($\beta = -.20$, $b = -5.47$, $t = -20.99$) also significantly predicted systolic blood pressure. The $r^2$ of systolic blood pressure for this model=.047, which was an improvement from model 1.

The results of relationship status typologies and race/ethnicity on systolic blood pressure and precocious life events after taking into account control variables can be seen in Figure 6. First, the results document significant direct effects of relationship typologies and race/ethnicity on precocious life events. Second, the figure documents the structural mediation pathway of precocious life events on systolic blood pressure. Specifically, never-married caregivers ($\beta = .11$, $b = .55$, $t = 9.44$), caregivers that divorce/separate early in the life of adolescents ($\beta = .15$, $b$
=.45, t = 15.35), caregivers that divorce/separate late in the life of adolescents (\(\beta = .14, b = .35, t = 15.25\)), and caregivers that transition in and out of marriage like relationships (\(\beta = .14, b = .64, t = 12.92\)) all significantly elevated the levels in precocious life events after controlling for all other variables. This argues for the meditational effect of precocious life events as never-married caregivers significantly predicted systolic blood pressure in Model 2, but no longer predicts systolic blood pressure (Baron & Kenny, 1986). Also, African-Americans (\(\beta = .03, b = .07, t = 2.79\)) positively influenced the levels in precocious transitions compared to Caucasians while Asians tend to experience fewer precocious life events (\(\beta = -.03, b = -.11, t = -2.80\)) compared to Caucasians after controlling for all other variables. Parental income (\(\beta = -.02, b = -.43, t = -2.19\)), education (\(\beta = -.06, b = -.03, t = -5.41\)), general health (\(\beta = -.06, b = -.08, t = -6.55\)), and adolescent gender (\(\beta = -.03, b = -.06, t = -3.47\)) at Wave 1 reduced the level in precocious transitions after controlling for all other variables. Also, precocious life events significantly predicted systolic blood pressure (\(\beta = .11, b = 1.59, t = 11.98\)). The addition of precocious life events also documented some prominent findings. In models 1 and 2, never-married caregivers significantly predicted systolic blood pressure. However, the results of the model show that this is no longer significant arguing for mediation of precocious life events for this relationship status typology on systolic blood pressure (Baron & Kenny, 1986). However, the main effects of being Hispanic-American (\(\beta = -.04, b = -1.45, t = -3.34\)) and African-American (\(\beta = .02, b = .65, t = -2.87\)) still remain though this effect is lessened (arguing for partial mediation). The \(r^2\) of systolic blood pressure (.02) showed improvement compared to model 2. The \(r^2\) of precocious life events for this model=.08.
Figure 4. Standardized regression estimates of relationship status typologies on systolic blood pressure ($t$-values in parentheses)

<table>
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<tr>
<td>Transitional</td>
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<td>.77</td>
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</table>

Systolic Blood Pressure

$R^2 = .044$

**Controls:** General Health ($\beta = -.01(-1.59)$), Parental Income ($\beta = -.04**(-3.01)$), Occupational Attainment ($\beta = -.01(-.51)$), Parent Education ($\beta = .02(-1.44)$), Parent Gender ($\beta = -.03**(-3.13)$), Adolescent Gender ($\beta = -.20**(-20.99)$)

*Note.* **$p < .01$, *$p < .05$**
Figure 5. Standardized estimates of relationship status typologies and ethnicity on systolic blood pressure (t-values in parentheses)

**Controls:** General Health ($\beta = -.01(-1.62)$), Parental Income ($\beta = -.04**(-2.87)$), Occupational Attainment ($\beta = -.01(-.60)$), Parent Education ($\beta = -.02(-1.40)$), Parent Gender ($\beta = -.03**(-3.17)$), Adolescent Gender ($\beta = -.20**(-20.99)$)

*Note. **p < .01, *p < .05*
Figure 6. Standardized estimates of typologies, ethnicity, and precocious life events on systolic blood pressure (t-values in parentheses)

Controls on Health: General Health ($\beta = -.01(-.87)$), Parental Income ($\beta = -.03**(-2.71)$), Occupational Attainment ($\beta = -.01(-.45)$), Parent Education ($\beta = -.03(-1.72)$), Parent Gender ($\beta = -.03**(-2.97)$), Adolescent Gender ($\beta = -.02**(-20.99)$)

Controls on Prec. Life Events: Gen. Health ($\beta = -.06**(-6.55)$), Par. Income ($\beta = -.02*(-2.19)$), Occ. Attain ($\beta = -.02(-1.61)$), Par. Education ($\beta = -.06**(-5.41)$), Par. Gender ($\beta = -.02(-1.76)$), Adol. Gender ($\beta = -.03**(-3.47)$)

Note. **$p < .01$, *$p < .05$
**Diastolic Blood Pressure**

The results/estimates of the influence of relationship status typologies on diastolic blood pressure after taking into account control variables at Wave 1 can be seen in Figure 7. First, never-married caregivers significantly predicted diastolic blood pressure at Wave 4 (β = .03, b = 1.66, t = 3.49). The standardized estimate can be interpreted as a one standard deviation unit increase in never-married results in a .03 standard deviation unit elevated level in diastolic blood pressure. Due to the dichotomized distribution, an unstandardized estimate may be more interpretable. This estimate equals 1.66, meaning caregivers that never marry compared to caregivers that are consistently married experience a 1.66 unit elevated level in diastolic blood pressure. Parental gender (β = -.02, b = -.85, t = -2.14), adolescent gender (β = -.13, b = -5.47, t = -14.30), and general health (β = -.02, b = -.28, t = -2.66) also negatively influenced diastolic blood pressure. The $\chi^2$=0.00(0), CFI = 1.00, RMSEA = .00, and SRMR = .00, suggesting good fit. The $r^2$ of diastolic blood pressure was .021.

The results/estimates of the influence of relationship status typologies and race/ethnicity on diastolic blood pressure after taking into account control variables at Wave 1 can be seen in Figure 8. The results document that never-married caregivers significantly predicted diastolic blood pressure after controlling for family demographics, general health, and race/ethnicity (β = .03, b = 1.47, t = 3.03). However, the magnitude of the effect reduced slightly. Transitional caregivers significantly predicted diastolic blood pressure after controlling for all other variables (β = .02, b = 1.17, t = 2.32) Also, Hispanic-Americans (β = -.04, b = -1.12, t = -3.35) and Asian/Pacific Island American (β = -.02, b = -.91, t = -2.18) documented a significant negative influence on diastolic blood pressure while the results revealed that African-Americans (β = .02, b = .42, t = 1.97) and Native Americans (β = .03, b = 1.45, t = 1.96) experienced a significant
elevated level in diastolic blood pressure with respect to Caucasians after controlling for relationship typologies, influences from other race/ethnicities, and family demographics. General health ($\beta = -.02, b = -.26, t = -2.64$), parental education ($\beta = -.02, b = -.10, t = -2.02$), adolescent gender ($\beta =-.13, b = -5.47, t = -19.30$), and parental gender ($\beta = -.02, b = -.82, t = -2.07$) also significantly predicted diastolic blood pressure. In model 2, parental education predicts diastolic blood pressure with the inclusion of race/ethnicity. This finding was not true for model 1. The $r^2$ of diastolic blood pressure was .047, which was an improvement.

The results/estimates of the influence of relationship status typologies and race/ethnicity on diastolic blood pressure and precocious life events after taking into account control variables can be seen in Figure 9. First, the results revealed significant direct effects of relationship typologies and race/ethnicity on precocious life events. Second, the figure documents the structural mediation pathway of precocious life events on diastolic blood pressure. Specifically, never-married caregivers ($\beta = .11, b = .55, t = 9.44$), caregivers that divorce/separate early in the life of adolescents ($\beta = .15, b = .45, t = 15.35$), caregivers that divorce/separate late in the life of adolescents ($\beta = .14, b = .35, t = 15.25$), and caregivers that transition in and out of marriage like relationships ($\beta = .14, b = .64, t = 12.92$) all significantly elevated the level in precocious life events after controlling for all other variables. Also, African-Americans ($\beta = .03, b = .07, t = 2.79$) experienced an elevated level in precocious transitions compared to Caucasians while Asians tend to experience fewer precocious life events ($\beta = -.03, b = -.11, t = -2.80$) compared to Caucasians after controlling for all other variables. Also, parental income ($\beta = -.02, b = -.43, t = -2.19$), education ($\beta = -.06, b = -.03, t = -5.41$), adolescent gender ($\beta = -.03, b = -.06, t = -3.47$), and general health at Wave 1 ($\beta = -.06, b = -.08, t = -6.55$) were negatively associated with precocious transitions after controlling for all other variables. Precocious life events
significantly predicted diastolic blood pressure ($\beta = .10, b = 1.05, t = 10.19$). In models 1 and 2, never-married caregivers, Native Americans, and African-Americans all significantly predicted diastolic blood pressure. However, the results of the model show that these effects are no longer significant arguing for mediation of precocious life events for these variables (Baron & Kenny, 1986). The main effects of being Hispanic-American ($\beta = -.04, b = -1.11, t = -3.31$) and Asian ($\beta = -.03, b = -1.02, t = -2.49$) still remain, though this effect is lessened (partial mediation). The $r^2$ of diastolic blood pressure (.033) showed improvement from model 2. The $r^2$ of precocious life events for this model was .08.

**Pulse Rate**

The results of the standardized estimates, $t$-values, and significance of estimates of relationship status typologies on pulse rate after controlling for general health at Wave 1, parental income, occupational attainment, parental education, and parent gender can be seen in Figure 10. First, never-married caregivers significantly predicted pulse rate at Wave 4 ($\beta = .03, b = 1.69, t = 2.82$). The standardized estimate can be interpreted as a one standard deviation unit increase in never-married results in a .03 standard deviation unit elevated level in pulse rate. Due to the dichotomized distribution, an unstandardized estimate may be more interpretable. This estimate equals 1.69, meaning caregivers that never marry compared to caregivers that are consistently married experience a 1.69 unit elevated level in pulse rate. Second, caregivers that divorced early in the life of adolescents ($\beta = .02, b = .70, t = 2.03$) and caregivers that transitioned from partner to partner ($\beta = .02, b = .87, t = 1.99$) experienced a significant elevated level in pulse rate. General health ($\beta = -.06, b = -.82, t = -6.51$), adolescent gender ($\beta = -.07, b = -1.70, t = -7.75$), and parental income ($\beta = -.05, b = -10.77, t = -4.32$) at Wave 1 also negatively influence pulse rate. The $r^2$ of pulse rate was .014.
Figure 7. Standardized regression estimates of relationship status typologies on diastolic blood pressure (t-values in parentheses)

<table>
<thead>
<tr>
<th>Status</th>
<th>Beta</th>
<th>SE</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
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<td>.01</td>
<td>3.49</td>
</tr>
<tr>
<td>Early Divorce</td>
<td>.01</td>
<td>.01</td>
<td>1.44</td>
</tr>
<tr>
<td>Late Divorce</td>
<td>.01**</td>
<td>.01</td>
<td>1.22</td>
</tr>
<tr>
<td>Transitional</td>
<td>.02**</td>
<td>.02</td>
<td>2.16</td>
</tr>
</tbody>
</table>

Diastolic Blood Pressure

$R^2 = .021$

**Controls:** General Health ($\beta = -.02**(-2.66))$, Parental Income ($\beta = -.03(-1.71)$), Occupational Attainment ($\beta = -.01(-1.02)$), Parent Education ($\beta = .01(-.52)$), Parent Gender ($\beta = -.02*(-2.14)$), Adolescent Gender ($\beta = -.13**(-14.30)$)

*Note.* **$p < .01$, *$p < .05$**
Figure 8. Standardized estimates of relationship status typologies and ethnicity on diastolic blood pressure (t-values in parentheses)

Controls: General Health ($\beta = -.02*(-.26)$), Parental Income ($\beta = -.03(-1.76)$), Occupational Attainment ($\beta = .01(-.85)$), Parent Education ($\beta = .02*(-2.02)$), Parent Gender ($\beta = .02*(-2.07)$), Adolescent Gender ($\beta = .13**(19.30)$)

Note. **p < .01, *p < .05
Figure 9. *Standardized estimates of typologies, ethnicity, and precocious life events on diastolic blood pressure (t-values in parentheses)*

**Controls on Health:** General Health ($\beta = -0.02**(-2.01)$), Parental Income ($\beta = -0.02(-1.73)$), Occupational Attainment ($\beta = -0.01(-.72)$), Parent Education ($\beta = -0.02(-1.45)$), Parent Gender ($\beta = -0.03(-1.87)$), Adolescent Gender ($\beta = -0.13**(-13.71)$)

**Controls on Prec. Life Events:** Gen. Health ($\beta = -0.06**(-6.55)$), Par. Income ($\beta = -0.02*(-2.19)$), Occ. Attain ($\beta = -0.02(-1.61)$), Par. Education ($\beta = -0.06**(-5.41)$), Par. Gender ($\beta = -0.02(-1.76)$), Adol. Gender ($\beta = -0.03**(-3.47)$)

*Note.* **$p < .01$, *$p < .05$**
The results/estimates of the influence of relationship status typologies and race/ethnicity on pulse rate after taking into account control variables at Wave 1 can be seen in Figure 11. The results document that never-married caregivers ($\beta = .03, b = 1.67, t = 2.77$), caregivers that divorce early in the life of adolescents ($\beta = .02, b = .70, t = 2.77$), and caregivers that transition in and out of marriage like relationships ($\beta = .02, b = .74, t = 1.96$) significantly predicted pulse rate after controlling for family demographics, general health, and race/ethnicity. However, the magnitude of the effect decreased slightly. Also, Asian/Pacific Island American ($\beta = -.03, b = -1.50, t = -3.48$) documented a significant negative influence on pulse rate with respect to Caucasians after controlling for relationship typologies, influences from other race/ethnicities, and family demographics. General health ($\beta = -.06, b = -.86, t = -6.66$), adolescent gender ($\beta = -.06, b = -1.61, t = -7.17$) and parental income ($\beta = -.05, b = -10.83, t = -4.37$) also significantly predicted pulse rate. The $r^2$ of pulse rate for this model=.011, which was an improvement from model 1.

The results/estimates of the influence of relationship status typologies and race/ethnicity on pulse rate and precocious life events after taking into account control variables at Wave 1 can be seen in Figure 12. First, the results of Figure 12 document significant direct effects of relationship typologies and race/ethnicity on precocious life events. Second, the figure documents the structural mediation pathway of precocious life events on pulse rate. Specifically, never-married caregivers ($\beta = .11, b = .55, t = 9.44$), caregivers that divorce/separate early in the life of adolescents ($\beta = .15, b = .45, t = 15.35$), caregivers that divorce/separate late in the life of adolescents ($\beta = .14, b = .35, t = 15.25$), and caregivers that transition in and out of marriage like relationships ($\beta = .14, b = .64, t = 12.92$) all significantly elevated the level in precocious life events after controlling for all other variables. Also, African-Americans ($\beta = .03, b = .07, t =
2.79) experience an elevated level in precocious transitions compared to Caucasians while
Asians tend to experience fewer precocious life events ($\beta = -.03, b = -.11, t = -2.80$) compared to
Caucasians after controlling for all other variables. Also, parental income ($\beta = -.02, b = -.43, t = 
-2.19$), education ($\beta = -.06, b = -.03, t = -5.41$), adolescent gender ($\beta = -.03, b = -.06, t = -3.47$),
and general health at Wave 1 ($\beta = -.06, b = -.08, t = -6.55$) were negatively association with
precocious transitions after controlling for all other variables. Precocious life events
significantly predicted pulse rate ($\beta = .06, b = .80, t = 6.80$). The addition of precocious life
events also documented some prominent findings. In models 1 and 2, early divorce and
transitional caregivers all significantly predicted pulse rate. However, the results of the model
show that these effects are no longer significant arguing for mediation of precocious life events
for these variables (Baron & Kenny, 1986). However, the main effects of being Asian/Pacific
Island American ($\beta = -.03, b = -1.42, t = -3.29$) still remain though this effect is lessened
(arguing for partial mediation). The $r^2$ of pulse rate ($0.02$) showed improvement compared to
model 2. The $r^2$ of precocious life events for this model=.08.

**Mean Arterial Pressure**

The results/estimates of the influence of relationship status typologies on mean arterial
pressure after taking into account control variables at Wave 1 can be seen in Figure 13. First,
never-married caregivers significantly predicted mean arterial pressure at Wave 4 ($\beta = .02, b = 
1.21, t = 2.31$). The standardized estimate can be interpreted as a one standard deviation unit
increase in never-married results in a .02 standard deviation unit elevated level in mean arterial
pressure. Due to the dichotomized distribution, an unstandardized estimate may be more
interpretable. This estimate equals 1.21, meaning caregivers that never marry compared to
Figure 10. Standardized regression estimates of relationship status typologies on pulse rate (t-values in parentheses)

Controls: General Health ($\beta = -.06**(-6.51)$), Parental Income ($\beta = -.05**(-4.32)$), Occupational Attainment ($\beta = -.02(-1.10)$), Parent Education ($\beta = .02(-1.42)$), Parent Gender ($\beta = .01(.73)$), Adolescent Gender ($\beta = -.07**(-7.75)$)

Note. **$p < .01$, *$p < .05$
Figure 11. Standardized estimates of relationship status typologies and ethnicity on pulse rate (t-values in parentheses)

Controls: General Health ($\beta = -.06^{**}(-6.66)$), Parental Income ($\beta = -.05^{**}(-4.37)$), Occupational Attainment ($\beta = -.02(-1.17)$), Parent Education ($\beta = -.02(-1.58)$), Parent Gender ($\beta = .01(.67)$), Adolescent Gender ($\beta = -.06^{**}(-7.17)$)

Note. **p < .01, *p < .05
Figure 12. *Standardized estimates of typologies, ethnicity, and precocious life events on pulse rate (t-values in parentheses)*

**Controls on Health:** General Health ($\beta = -0.06**(-6.23)$), Parental Income ($\beta = -0.04**(-4.28)$), Occupational Attainment ($\beta = -0.02 (-1.03)$), Parent Education ($\beta = -0.02(-1.22)$), Parent Gender ($\beta = 0.00(-0.83)$), Adolescent Gender ($\beta = -0.05**(-3.91)$)

**Controls on Prec. Life Events:** Gen. Health ($\beta = -0.06**(-6.55)$), Par. Income ($\beta = -0.02*(-2.19)$), Occ. Attain ($\beta = -0.02(-1.61)$), Par. Education ($\beta = -0.06**(-5.41)$), Par. Gender ($\beta = -0.02(-1.76)$), Adol. Gender ($\beta = -0.03**(-3.47)$)

Note. **$p < .01$, *$p < .05$**
caregivers that are consistently married experience a 1.21 unit elevated level in mean arterial pressure. Second, caregivers that transition frequently from partner to partner (\(\beta = .03, b = .80, t = 3.61\)) experienced an elevated level in mean arterial pressure. General health (\(\beta = -.02, b = -.24, t = -2.29\)), adolescent gender (\(\beta = -.17, b = -3.61, t = -17.44\)), and parental income (\(\beta = -.03, b = -6.82, t = -2.38\)) at Wave 1 also negatively influenced mean arterial pressure. The \(r^2\) of mean arterial pressure was .032.

The results/estimates of the influence of relationship status typologies and race/ethnicity on mean arterial pressure after taking into account control variables can be seen in Figure 14. The results document that never-married caregivers (\(\beta = .02, b = .96, t = 2.01\)) and caregivers that frequently transition in and out of marriage like relationships (\(\beta = .02, b = .74, t = 2.54\)) significantly predicted mean arterial pressure after controlling for family demographics, general health, and race/ethnicity. However, the magnitude of the effect decreased slightly. Also, Hispanic-American (\(\beta = -.04, b = -1.25, t = -3.52\)) documented a significant negative influence on mean arterial pressure with respect to Caucasians after controlling for relationship typologies, influences from other race/ethnicities, and family demographics. Moreover, African-Americans significantly elevated the level in mean arterial pressure (\(\beta = .02, b = .50, t = 1.97\)). General health (\(\beta = -.02, b = -1.13, t = -2.22\)), parental income (\(\beta = -.03, b = -6.63, t = -2.30\)), adolescent gender (\(\beta = -.17, b = -3.60, t = -17.40\)), and parental gender (\(\beta = -.02, b = -.24, t = -2.63\)) also predicted mean arterial pressure. The \(r^2\) of mean arterial pressure was .035 (an improvement).

The results/estimates of the influence of relationship status typologies and race/ethnicity on mean arterial pressure and precocious life events after taking into account control variables at Wave 1 can be seen in Figure 15. First, the results document significant direct effects of relationship typologies and race/ethnicity on precocious life events. Second, the figure
documents the structural mediation pathway of precocious life events on mean arterial pressure. Specifically, never-married caregivers ($\beta = .11, b = .55, t = 9.44$), caregivers that divorce/separate early in the life of adolescents ($\beta = .15, b = .45, t = 15.35$), caregivers that divorce/separate late in the life of adolescents ($\beta = .14, b = .35, t = 15.25$), and caregivers that transition in and out of marriage like relationships ($\beta = .14, b = .64, t = 12.92$) all significantly increased the level in precocious life events after controlling for all other variables. Also, African-Americans ($\beta = .03, b = .07, t = 2.79$) positively influenced the level in precocious transitions compared to Caucasians while Asians tend to experience fewer precocious life events ($\beta = -.03, b = -.11, t = -2.80$) compared to Caucasians after controlling for all other variables. Also, parental income ($\beta = -.02, b = -.43, t = -2.19$), education ($\beta = -.06, b = -.03, t = -5.41$), adolescent gender ($\beta = -.03, b = -.06, t = -3.47$), and general health at Wave 1 ($\beta = -.06, b = -.08, t = -6.55$) negatively influenced precocious transitions after controlling for all other variables. Precocious life events significantly predicted mean arterial pressure ($\beta = .09, b = .94, t = 8.86$). In models 1 and 2, never-married caregivers and African-American ethnicity all significantly predicted mean arterial pressure. The results of the meditational model show that these effects are no longer significant arguing for the mediation of precocious life events (Baron & Kenny, 1986). However, the main effects of being Hispanic-American ($\beta = -.04, b = -1.23, t = -3.48$) remain though this effect is lessened. The $r^2$ of mean arterial pressure (.041) improved from model 2. The $r^2$ of precocious life events was .08.
Figure 13. Standardized regression estimates of relationship status typologies on mean arterial pressure (t-values in parentheses)

<table>
<thead>
<tr>
<th>Status</th>
<th>Coefficient</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never Married</td>
<td>.02**</td>
<td>2.31</td>
</tr>
<tr>
<td>Early Divorce</td>
<td>.00</td>
<td>.44</td>
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<tr>
<td>Late Divorce</td>
<td>.01</td>
<td>.82</td>
</tr>
<tr>
<td>Transitional</td>
<td>.03**</td>
<td>3.61</td>
</tr>
</tbody>
</table>

Mean Arterial Pressure

$R^2 = .032$

**Controls:** General Health ($\beta = -.02^{**} (-2.29)$), Parental Income ($\beta = -.03* (-2.38)$), Occupational Attainment ($\beta = -.01 (-.94)$), Parent Education ($\beta = .01 (-.66)$), Parent Gender ($\beta = -.03 (-2.66)$), Adolescent Gender ($\beta = -.17^{**} (-17.44)$)

**Note.** **$p < .01$, *$p < .05$**
Figure 14. Standardized estimates of relationship status typologies and ethnicity on mean arterial pressure (t-values in parentheses)

Controls: General Health ($\beta = -.02*(-.22)$), Parental Income ($\beta = -.03*(-.30)$), Occupational Attainment ($\beta = .01(-.96)$), Parent Education ($\beta = .02(-1.70)$), Parent Gender ($\beta = .02**(-2.63)$), Adolescent Gender ($\beta = .17**(-17.31)$)

Note. **$p < .01$, *$p < .05$
Figure 15. *Standardized estimates of typologies, ethnicity, and precocious life events on mean arterial pressure (t-values in parentheses)*

**Controls on Health:** General Health ($\beta = -.02(-1.66)$), Parental Income ($\beta = -.03*(-2.20)$), Occupational Attainment ($\beta = -.01(-.85)$), Parent Education ($\beta = -.02(-1.47)$), Parent Gender ($\beta = -.02*(-2.52)$), Adolescent Gender ($\beta = -.16**(-17.21)$)

**Controls on Prec. Life Events:** Gen. Health ($\beta = -.06**(-6.55)$), Par. Income ($\beta = -.02*(-2.19)$), Occ. Attain ($\beta = .02(.61)$), Par. Education ($\beta = -.06**(-5.41)$), Par. Gender ($\beta = .02(-1.76)$), Adol. Gender ($\beta = .03**(-3.47)$)

*Note.* **$p < .01$, *$p < .05$**
**Body Mass Index at Wave 4**

The results/estimates of the influence of relationship status typologies on BMI (Wave 4) after taking into account control variables and BMI (Wave 1) is presented in Figure 16. First, never-married caregivers significantly predicted BMI at Wave 4 at Wave 4 ($\beta = .05, b = 1.81, t = 3.93$). The standardized estimate can be interpreted as a one standard deviation unit increase in never-married (with respect to consistently married care-givers) results in a .05 standard deviation unit elevated level in BMI at Wave 4. Due to the dichotomized distribution, an unstandardized estimate may be more interpretable. This estimate equals 1.81, meaning caregivers that never marry compared to caregivers that are consistently married experience a 1.81 unit elevated level in BMI at Wave 4. Second, caregivers that divorce early in the life of adolescents ($\beta = .02, b = .47, t = 1.96$) and growing up transitional caregivers ($\beta = .04, b = .64, t = 2.86$) experienced an elevated level in BMI at Wave 4. BMI at Wave 1 ($\beta = .30, b = .35, t = 14.73$), parental income ($\beta = -.07, b = -9.30, t = -6.47$), and parental education ($\beta = -.08, b = -.23, t = -6.38$) at Wave 1 negatively influenced BMI at Wave 4. The $r^2$ of BMI (Wave 4) = .06.

The results/estimates of the influence of relationship status typologies and race/ethnicity on BMI at Wave 4 after taking into account control variables at Wave 1 can be seen in Figure 17. The results document that never-married caregivers ($\beta = .03, b = 1.26, t = 2.81$) and caregivers that frequently transition in and out of marriage like relationships ($\beta = .02, b = .52, t = 2.68$) significantly predicted BMI at Wave 4 after controlling for family demographics, BMI at wave 1, and race/ethnicity. However, the magnitude of the effect decreased slightly. Also, Hispanic-American ($\beta = .03, b = .67, t = -2.68$) documented a significant increase in BMI at Wave 4 with respect to Caucasians after controlling for relationship typologies, influences from other race/ethnicities, and family demographics. Moreover, African-Americans ($\beta = .09, b = 1.56, t =
8.61) and Native Americans ($\beta = .03, b = 1.20, t = 2.15$) significantly elevated the level in BMI at Wave 4. BMI at Wave 1 ($\beta = .30, b = .34, t = 14.73$), parental income ($\beta = -.06, b = -7.90, t = -5.78$), and parental education ($\beta = -.07, b = -.21, t = -5.77$) also significantly predicted BMI at Wave 4. The $r^2$ of BMI at Wave 4 was .07 (an improvement from Model 1).

The results/estimates of the influence of relationship status typologies and race/ethnicity on BMI at Wave 4 and precocious life events after taking into account control variables at Wave 1 can be seen in Figure 18. First, the results of Figure 18 document significant direct effects of relationship typologies and race/ethnicity on precocious life events. Second, the figure documents the structural mediation pathway of precocious life events on BMI at Wave 4. Specifically, never-married caregivers ($\beta = .11, b = .55, t = 9.46$), caregivers that divorce/separate early in the life of adolescents ($\beta = .16, b = .49, t = 15.46$), caregivers that divorce/separate late in the life of adolescents ($\beta = .14, b = .38, t = 15.28$), and caregivers that transition in and out of marriage like relationships ($\beta = .15, b = .65, t = 13.03$) all significantly elevated the level in precocious life events after controlling for all other variables. Also, African-Americans ($\beta = .03, b = .07, t = 2.61$) experience an elevated level in precocious transitions compared to Caucasians where Asian-Americans tend to experience fewer precocious life events ($\beta = -.03, b = -.11, t = -2.48$) compared to Caucasians after controlling for all other variables. Also, parental income ($\beta = -.02, b = -.43, t = -2.28$), education ($\beta = -.07, b = -.11, t = -5.83$), and BMI at Wave 1 ($\beta = .09, b = .23, t = 3.63$) influence the likelihood of precocious transitions after controlling for all other variables. Precocious life events significantly predicted BMI at Wave 4 ($\beta = .13, b = .97, t = 12.91$). The addition of precocious life events also documented some prominent findings. In models 1 and 2, never-married caregivers significantly predicted BMI at Wave 4. However, the results of the model show that these effects are no
longer significant arguing for mediation of precocious life events for these variables (Baron & Kenny, 1986). However, the main effects of being Hispanic-American ($\beta = .03$, $b = .67$, $t = 2.74$), African-American ($\beta = .09$, $b = 1.50$, $t = 8.38$), and Native American ($\beta = .03$, $b = 1.12$, $t = 2.11$) still remain though this effect is lessened (arguing for partial mediation). The $r^2$ of BMI at Wave 4 (.09) showed improvement from model 2. The $r^2$ of precocious life events was .08.

**Depression at Wave 4**

The results/estimates of the influence of relationship status typologies on depression (Wave 4) after taking into account control variables and depression (Wave 1) is presented in Figure 19. First, never-married caregivers significantly predicted depression at Wave 4 at Wave 4 ($\beta = .05$, $b = 1.33$, $t = 5.27$). The standardized estimate can be interpreted as a standard deviation unit increase in never-married results in a .05 standard deviation unit elevated level in depression at Wave 4. Due to the dichotomized distribution, an unstandardized estimate may be more interpretable. This estimate equals 1.33, meaning caregivers that never marry compared to caregivers that are consistently married experience a 1.33 unit elevated level in depression at Wave 4. Second, caregivers that divorce early in the life of adolescents ($\beta = .04$, $b = .62$, $t = 4.94$), caregivers that divorce late in the life of adolescents ($\beta = .03$, $b = .45$, $t = 4.33$) and growing up with transitional caregivers ($\beta = .06$, $b = 1.17$, $t = 5.98$) experienced an elevated level in depression at Wave 4. Depression at Wave 1 ($\beta = .23$, $b = .23$, $t = 25.09$), parental income ($\beta = -.03$, $b = -2.26$, $t = -3.26$), adolescent gender ($\beta = .03$, $b = .33$, $t = 3.44$), and parental education ($\beta = -.05$, $b = -.10$, $t = -4.66$) at Wave 1 also negatively influenced depression at Wave 4. The $r^2$ for Wave 4 depression was .08.
**Figure 16.** Standardized regression estimates of relationship status typologies on body mass index (t-values in parentheses)

<table>
<thead>
<tr>
<th>Relationship Status</th>
<th>Coefficient</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never Married</td>
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<td>3.93</td>
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<td>Early Divorce</td>
<td>.02*</td>
<td>1.96</td>
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<tr>
<td>Late Divorce</td>
<td>.01</td>
<td>1.03</td>
</tr>
<tr>
<td>Transitional</td>
<td>.04**</td>
<td>2.86</td>
</tr>
</tbody>
</table>

**BMI R² = .06**

**Controls:** BMI Wave 1 ($\beta = .30**(-14.73)$), Parental Income ($\beta = -.07**(-6.47)$), Occupational Attainment ($\beta = -.01(-.35)$), Parent Education ($\beta = -.08**(-6.38)$), Parent Gender ($\beta = -.01(-.94)$), Adolescent Gender ($\beta = -.01(-.43)$)

**Note:** **p < .01, *p < .05**
Figure 17. Standardized estimates of relationship status typologies and ethnicity on body mass index (t-values in parentheses)

Controls: BMI Wave 1 ($\beta = .30**(14.73)$), Parental Income ($\beta = -.06**(5.78)$), Occupational Attainment ($\beta = -.01(-.45)$), Parent Education ($\beta = -.07**(5.77)$), Parent Gender ($\beta = -.01(-1.36)$), Adolescent Gender ($\beta = -.01(-.37)$)

Note. **$p < .01$; *$p < .05$
Figure 18. *Standardized estimates of typologies, ethnicity, and precocious life events on body mass index (t-values in parentheses)*

**Controls on Health:** BMI Wave 1 ($\beta = .30**(14.62)$), Parental Income ($\beta = -.05**(-5.72)$), Occupational Attainment ($\beta = .00(-.23)$), Parent Education ($\beta = -.06**(-5.08)$), Parent Gender ($\beta = -.01(-1.08)$), Adolescent Gender ($\beta = -.01(-.31)$)

**Controls on Prec. Life Events:** BMI Wave 1 ($\beta = .09*(3.63)$), Par. Income ($\beta = .02*(-2.19)$), Occ. Attain ($\beta = -.02(-1.61)$), Par. Education ($\beta = -.06**(-5.41)$), Par. Gender ($\beta = -.02(-1.76)$), Adol. Gender ($\beta = -.03**(-3.47)$)

*Note.* **p < .01, *p < .05*
The results/estimates of the influence of relationship status typologies and race/ethnicity on depression at Wave 4 after taking into account control variables at Wave 1 can be seen in Figure 20. The results document that never-married caregivers (β = .05, b = 1.12, t = 4.64), caregivers that divorce/separate early in the life of adolescents (β = .04, b = .58, t = 4.65), caregivers that divorce late in the life of adolescents (β = .02, b = .42, t = 3.82) and transitional caregivers (β = .06, b = 1.14, t = 5.78) significantly elevated the level in depression at Wave 4 after controlling for family demographics, depression at Wave 1, and race/ethnicity. Also, Hispanic-American (β = -.04, b = -.45, t = -2.92) documented a significant decrease in depression at Wave 4 with respect to Caucasians after controlling for relationship typologies, influences from other race/ethnicities, and family demographics. Moreover, African-Americans (β = .04, b = .47, t = 3.02), Other race/ethnicity (β = .04, b = .60, t = 3.52) and Native Americans (β = .03, b = .65, t = 3.02) significantly elevated the level in offspring depression at Wave 4. Depression at Wave 1 (β = .23, b = .23, t = 24.77), parental income (β = -.02, b = -1.96, t = -2.79), adolescent gender (β = .03, b = .26, t = 3.30), and parental education (β = -.06, b = -.10, t = -4.93) negatively influenced depression at Wave 4. The $r^2$ of depression at Wave 4 was .082, which was an improvement from model 1.

The results/estimates of the influence of relationship status typologies and race/ethnicity on depression at Wave 4 and precocious life events after taking into account control variables at Wave 1 can be seen in Figure 21. Specifically, never-married caregivers (β = .11, b = .54, t = 9.41), caregivers that divorce/separate early in the life of adolescents (β = .15, b = .46, t = 15.22), caregivers that divorce/separate late in the life of adolescents (β = .14, b = .39, t = 15.08), and experiences from transitional caregivers (β = .15, b = .65, t = 12.87) all significantly elevated the level in precocious life events after controlling for all other variables. Also,
African-Americans ($\beta = .03, b = .07, t = 2.48$) experience an elevated level in precocious transitions compared to Caucasians while Asian-Americans tend to experience fewer precocious life events ($\beta = -.03, b = -.11, t = -3.11$) compared to Caucasians after controlling for all other variables. Parental income ($\beta = -.02, b = -.43, t = -2.50$), education ($\beta = -.05, b = -.09, t = -4.70$), adolescent gender ($\beta = -.03, b = -.06, t = -3.47$), and depression at Wave 1 ($\beta = .07, b = .07, t = 5.10$) significantly influenced the likelihood of precocious transitions after controlling for all other variables. Furthermore, precocious life events significantly predicted depression at Wave 4 ($\beta = .09, b = .41, t = 9.13$). Hispanic-Americans ($\beta = -.03, b = -.44, t = -2.89$), African-Americans ($\beta = .04, b = .45, t = 4.38$), Other racial category ($\beta = .04, b = .60, t = 3.50$) and Native Americans ($\beta = .02, b = .61, t = 2.91$) also significantly influenced depression at Wave 4. The $r^2$ of precocious life events for this model=.08.

**The Fully Operationalized Model**

Table 5 presents the results of the fully operationalized model for the current study. This model includes standardized estimates, $t$-values, and standard errors using the complex SEM procedure in MPLUS version 6.0. Based on the results of the previous models, a fully operationalized meditational model was evaluated. The results of the fully operationalized model revealed similar findings to the models that evaluated individual health outcomes. First, in general, relationship status typologies exerted few direct effects on physical health outcomes. Transitional caregivers significantly elevated the level of offspring diastolic blood pressure ($\beta = .02, p < .05$) and mean arterial pressure ($\beta = .03, p < .01$). Never-married caregivers significantly influenced pulse rate in the positive direction ($\beta = .02, p < .05$) while early divorced caregivers significantly influenced BMI at Wave 4 ($\beta = .02, p < .05$). Also, all relationship
Figure 19. *Standardized regression estimates of relationship status typologies on depression (t-values in parentheses)*

<table>
<thead>
<tr>
<th>Relationship Status</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never Married</td>
<td>.05**(5.27)</td>
</tr>
<tr>
<td>Early Divorce</td>
<td>.04**(4.94)</td>
</tr>
<tr>
<td>Late Divorce</td>
<td>.03**(4.33)</td>
</tr>
<tr>
<td>Transitional</td>
<td>.06**(5.98)</td>
</tr>
</tbody>
</table>

**Depression Wave 4**

\[ R^2 = .08 \]

**Controls:** Depression Wave 1 (\( \beta = .23**(-25.09) \)), Parental Income (\( \beta = -.03**(-3.26) \)), Occupational Attainment (\( \beta = .00(-.13) \)), Parent Education (\( \beta = -.05**(-4.66) \)), Parent Gender (\( \beta = -.02(-1.77) \)), Adolescent Gender (\( \beta = .03**(3.44) \))

**Note.** **p < .01, *p < .05**
Figure 20. *Standardized estimates of relationship status typologies and ethnicity on depression (t-values in parentheses)*

- Never Married: .05** (4.64)
- Early Divorce: .04** (4.65)
- Late Divorce: .02** (3.82)
- Transitional: .06** (5.78)
- Hispanic: -.04** (-2.92)
- African Amer.: .04** (4.60)
- Native: .03** (3.02)
- Asian: -.01 (-1.23)
- Other: .04** (3.52)

**Controls:** Depression at Wave 1 ($\beta = .23** (24.77)$), Parental Income ($\beta = -.02** (-2.79)$), Occupational Attainment ($\beta = .00 (-.12)$), Parent Education ($\beta = -.06** (-4.93)$), Parent Gender ($\beta = -.01 (-1.66)$), Adolescent Gender ($\beta = .03** (3.30)$)

*Note.* **p < .01, *p < .05
Figure 21. *Standardized estimates of typologies, ethnicity, and precocious life events on depression (t-values in parentheses)*

**Controls on Health:** Depress. Wave 1 ($\beta = .23** (.24.17)$), Parental Income ($\beta = -.02* (-.250))$, Occupational Attainment ($\beta = .00(-.26)$), Parent Education ($\beta = -.05** (-.470)$), Parent Gender ($\beta = -.02(-1.78)$), Adolescent Gender ($\beta = .03**(.325)$)

**Controls on Prec. Life Events:** Dep. Wave 1 ($\beta = .07**(.231)$), Par. Income ($\beta = -.02*(-1.19)$), Occ. Attain ($\beta = -.02(-1.61)$), Par. Education ($\beta = -.06**(-.41)$), Par. Gender ($\beta = -.02(-1.76)$), Adol. Gender ($\beta = .03**(.47)$)

*Note.* **$p < .01$, $*p < .05$*
status typologies significantly influenced depressed mood at Wave 4 (β ranged from -0.02 to -0.05, p < .01).

In general, race/ethnicity differentially influenced health outcomes. Specifically, inclusion in the Hispanic-American race/ethnicity significantly decreased systolic/diastolic blood pressure, mean arterial pressure, and Depression (β ranged from -0.03 to -0.04, p < .05). However, inclusion in the Hispanic-American race/ethnicity had a significant positive association with Wave 4 BMI (β = .03, p < .01). A similar finding was documented for Asian/Pacific Island Americans. Specifically, inclusion into the Asian/Pacific Island race/ethnicity significantly decreased diastolic blood pressure and mean arterial pressure (β = -0.03, p < .01, respectively). Also, in general, African-Americans and Native Americans saw an elevated level in health outcomes with respect to Caucasians. Specifically, being African-American significantly elevated the level in systolic blood pressure (β = .02, p < .05), mean arterial pressure (β = .02, p < .05), BMI (β = .09, p < .01), and depression (β = .04, p < .05) while Native Americans (race/ethnicity) elevated the level in diastolic blood pressure (β = .03, p < .05), BMI (β = .03, p < .05), and depression (β = .03, p < .01).

In general, the control variables for the current study exerted a negative influence on health outcomes. First, if female caregivers were female, then the later offspring documented a significant decrease in systolic blood pressure and mean arterial pressure (β = .02, p < .05, respectively). Second, adolescents’ gender (female compared to male) significantly decreased systolic blood pressure (β = -.20, p < .01), diastolic blood pressure (β = -.13, p < .01), pulse rate (β = -.07, p < .01), mean arterial pressure (β = -.17, p < .01), and depressed mood (β = -.03, p < .01). For physical health outcomes, these differences may be due to biological sex differences in physical health functioning rather than stress. However, the coefficient for depression would be
more in line with a stress related process that may differ for males/females. Third, parental
education significantly decreased offspring BMI (β = -.06, p < .01) and depressed mood (β = -.05, p < .01) depressed mood. Fourth, parental income significantly decreased diastolic blood
pressure (β = -.04, p < .01), pulse rate (β = -.05, p < .01), mean arterial pressure (β = -.03, p < .05), BMI (β = -.06, p < .01), and depression (β = -.02, p < .01).

The results of the fully operationalized model confirmed the meditational association
between relationship status typologies and physical/mental health outcomes. First, adverse
relationship status typologies significantly elevated the level in youth precocious life events (β ranged from .11 to .15, p < .01) with respect to consistently married caregivers and after controlling for all other associations. Race/ethnicity also had an influence on precocious life events in offspring. African-Americans experienced more precocious transitions compared to Caucasians (β = .03, p < .01) while Asian/Pacific Island Americans experienced fewer precocious transitions (β = -.03, p < .01). Furthermore, youth precocious life events significantly elevated levels in all mental/physical health outcomes (β ranged from .06 to .13, p < .01).

Finally, the Satorra-Bentler chi-square estimate for the fully operationalized model
equaled 271.33 with 15 degrees of freedom. The Scaling Correction Factor was 1.097. The CFI
= .99, RMSEA = .03, and the SRMR = .01. The high CFI (greater than .95), and low RMSEA/SRMR (less than .05) suggest the fully operationalized model is fitting the observed
data well. Precocious life events had an $R^2$=.08, systolic blood pressure had an $R^2$=.02, diastolic blood pressure had an $R^2$=.02, pulse rate had an $R^2$=.01, mean arterial pressure had an $R^2$=.01, BMI at Wave 4 had an $R^2$=.08, and depression at Wave 4 had an $R^2$=.09.

**Testing Nested Models of the Fully Operationalized Model**
Table 5. The Estimated Path Coefficients of the Fully Operationalized Model of Independent Variables Predicting Outcome Variables (With the Following Format: Standardized Estimates, T-values (Standard Errors))

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Precocious Life Events</th>
<th>Systolic Blood Pressure</th>
<th>Diastolic Blood Pressure</th>
<th>Pulse Rate</th>
<th>Mean Arterial Pressure</th>
<th>BMI Wave 4</th>
<th>Depression Wave 4</th>
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</thead>
<tbody>
<tr>
<td>Relationship Typologies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never Mar</td>
<td>.11^4,9.47(.01)</td>
<td>.01,1.13(.01)</td>
<td>.02,1.86(.01)</td>
<td>.02^5,2.03(.01)</td>
<td>.01,84(.01)</td>
<td>.02,1.59(.01)</td>
<td>.04^4,3.91(.01)</td>
</tr>
<tr>
<td>Early Div</td>
<td>.16^4,15.44(.01)</td>
<td>.01,1.59(.01)</td>
<td>.00,33(.01)</td>
<td>.01,89(.01)</td>
<td>.01,1.12(.01)</td>
<td>.02^5,2.03(.01)</td>
<td>.03^4,3.13(.01)</td>
</tr>
<tr>
<td>Late Div</td>
<td>.14^4,15.29(.01)</td>
<td>.01,1.16(.01)</td>
<td>.00,27(.01)</td>
<td>.01,96(.01)</td>
<td>.01,56(.01)</td>
<td>.02,1.62(.01)</td>
<td>.02^4,2.66(.01)</td>
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<tr>
<td>Transition</td>
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<td>.02,1.73(.01)</td>
<td>.02^4,1.96(.01)</td>
<td>.01,53(.01)</td>
<td>.03^4,3.01(.01)</td>
<td>.00,38(.01)</td>
<td>.05^4,4.53(.01)</td>
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<td>Race/Ethnic.</td>
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<td>Hispanic</td>
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<td>-.04^4,.329(.01)</td>
<td>-.04^4,.329(.01)</td>
<td>.02^4,.149(.01)</td>
<td>-.04^4,.346(.01)</td>
<td>.03^4,.268(.01)</td>
<td>-.03^4,.277(.01)</td>
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<td>.02^3,.201(.01)</td>
<td>.01,1.36(.01)</td>
<td>.01^4,.68(.01)</td>
<td>.02^4,.199(.01)</td>
<td>.09^4,8.40(.01)</td>
<td>.04^4,4.46(.01)</td>
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<td>Native</td>
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<td>.03^4,1.97(.01)</td>
<td>.01,86(.01)</td>
<td>.02,1.64(.02)</td>
<td>.03^4,2.06(.01)</td>
<td>.02^4,2.89(.01)</td>
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<td>-.03^4,.256(.01)</td>
<td>-.03^4,.317(.01)</td>
<td>-.02,1.61(.01)</td>
<td>-.01,.120(.01)</td>
<td>-.01^4,.157(.01)</td>
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<td>Other</td>
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<td>.00,.22(.01)</td>
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<td>.00,.10(.01)</td>
<td>.01,.93(.01)</td>
<td>.04^4,.341(.01)</td>
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<td>Precoc. Life Events</td>
<td>--</td>
<td>.12^4,.12.16 (.01)</td>
<td>.10^4,.1033 (.01)</td>
<td>.06^4,.692 (.01)</td>
<td>.09^4,.902 (.01)</td>
<td>.13^4,.12.94 (.01)</td>
<td>.09^4,.910 (.01)</td>
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Controls

<table>
<thead>
<tr>
<th></th>
<th>Precocious Life Events</th>
<th>Systolic Blood Pressure</th>
<th>Diastolic Blood Pressure</th>
<th>Pulse Rate</th>
<th>Mean Arterial Pressure</th>
<th>BMI Wave 4</th>
<th>Depression Wave 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Par. Gender</td>
<td>-.02^4,.2-69 (.01)</td>
<td>-.03^4,.294 (.01)</td>
<td>-.02,.184 (.01)</td>
<td>.01,.85 (.01)</td>
<td>.02^4,.2-42 (.01)</td>
<td>-.01,.1-06 (.01)</td>
<td>-.02,1.88 (.01)</td>
</tr>
<tr>
<td>Par Occup.</td>
<td>-.01^4,.45 (.02)</td>
<td>-.01,.68 (.02)</td>
<td>-.02,.109 (.02)</td>
<td>-.01,.84 (.02)</td>
<td>-.01,.34 (.02)</td>
<td>.00,.28 (.01)</td>
<td></td>
</tr>
<tr>
<td>Adol.Gender</td>
<td>-.03^4,.3-13 (.01)</td>
<td>-.20^4,.19.85 (.01)</td>
<td>-.13^4,.13.79 (.01)</td>
<td>.07^4,.8-01 (.01)</td>
<td>-.17^4,.17.6 (.01)</td>
<td>-.01,.22 (.01)</td>
<td>.03^4,.318 (.01)</td>
</tr>
<tr>
<td>Par. Edu.</td>
<td>-.06^4,.5-36 (.01)</td>
<td>-.02,.1-87 (.01)</td>
<td>-.02,.161 (.01)</td>
<td>-.02,.137 (.01)</td>
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<td>.06^4,.5-09 (.01)</td>
<td>.05^4,.4-57 (.01)</td>
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<td>Par. Inc.</td>
<td>-.02^4,.2-10 (.01)</td>
<td>-.04^4,.2-86 (.01)</td>
<td>-.03,.179 (.01)</td>
<td>-.05^4,.4-32 (.01)</td>
<td>-.03^4,.2-25 (.01)</td>
<td>.06^4,.5-78 (.01)</td>
<td>-.02^4,.2-53 (.01)</td>
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<td>Gen. Hlth 1</td>
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<td>-.02^4,.2-24 (.01)</td>
<td>-.00,.6-01 (.01)</td>
<td>-.04^4,.4-32 (.01)</td>
<td>-.01,.1-19 (.01)</td>
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<tr>
<td>Depress 1</td>
<td>--</td>
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<td>--</td>
<td>--</td>
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<td>--</td>
<td>.22^4,.24.55 (.01)</td>
</tr>
<tr>
<td>BMI 1</td>
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<td>--</td>
<td>--</td>
<td>--</td>
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<td></td>
</tr>
</tbody>
</table>

\[ R^2 \]   
.08                  .06                   .032                   .017                   .041                   .09                   .13

Note. a denotes \( p < .01 \), b denotes \( p < .05 \). 1 denotes control variables at wave 1. 4 denotes outcome measurements at Wave 4. \( D_f = 13117 \)  
Correlations between outcome variables (respectively) and relationship status typologies (respectively) taken into account. \( \chi^2 (df, 15) = 271.33 \), CFI = .99, RMSEA = .03, SRMR = .01, Scaling Correction Factor = 1.097
The current study used the complex procedure in MPLUS to evaluate nested models in order to establish the most preferable/appropriate model with respect to the fully operational model as presented in Table 5. The calculated Satorra-Bentler $\chi^2$ for this model was 271.33 with 15 degrees of freedom (CFI = .99, RMSEA = .03, SRMR = .01). The Scaling Correction Factor equaled 1.097. The first restricted model removed the direct effects of relationship status typologies on mental/physical health outcomes. Specifically, path estimates were set at 0 for never-married caregivers, early divorced/separated caregivers, late divorced/separated caregivers, and transitional caregivers on all outcome variables (freeing up 24 degrees of freedom for the reduced model). The Satorra-Bentler $\chi^2$ for the reduced model was 399.18 with 39 degrees of freedom (CFI = .98, RMSEA = .03, SRMR = .01) and the Scaling Correction Factor equaled 1.249. The adjusted $\chi^2$ difference (with 24 degrees of freedom) using the TRd formula (Satorra, 2000) equaled 149.50. This Satorra-Bentler $\chi^2$ value is often referred to as a robust $\chi^2$ due to an adjustment to sample and cluster size (Satorra, 2000). The critical value for a $\chi^2 (24) = 36.42$. The calculated robust $\chi^2 (24)$ difference of 149.50 exceeded the critical value providing evidence in favor of the fully operationalized being the most appropriate model; meaning it is significantly adding in explained variation in the outcome variables (Bentler & Bonett, 1980).

Similarly, a nested model where race/ethnicity path coefficients were set at 0 was evaluated (thus constraining the direct influences of race/ethnicity on health). The $\chi^2 (45)$ of this model equaled 371.92 (CFI = .95, RMSEA = .05, SRMR = .03) with a scaling Correction Factor = 1.123. The calculated robust $\chi^2 (30)$ difference between this model and the fully operationalized model equaled 210.56 which exceeded the critical value (43.77). This provides
evidence in favor of the fully operationalized model being the most appropriate model in explaining the covariance matrix (Bentler & Bonett, 1980).

The next constrained model removed the meditational influences of race/ethnicity and relationship status typologies on precocious life events. The $\chi^2$ (24) of this model was (950.86) and was ill-fitting to the observed data (CFI = .81, RMSEA = .10, SRMR = .09). The Scaling Correction Factor for this model = 1.276. The calculated robust $\chi^2$ (9) difference = 581.73 which exceeds the critical $\chi^2$ (9) value (16.92). This provides evidence that the fully operationalized model is the most appropriate model to fit to the data.

Finally, a constrained model that removed non-significant effects from the fully operationalized model was estimated. The robust $\chi^2$ (49) of this model was 330.463, CFI = .96, RMSEA = .03, SRMR = .02, and the Scaling Correction Factor equaled 1.195. The calculated robust $\chi^2$ (34) difference yielded 78.53. This value exceeds the critical $\chi^2$ (34) value (48.60), thus providing evidence in favor of the fully operationalized model being the most appropriate model to fit to the data.

**Testing Moderations**

In order to evaluate moderating effects, several steps were taken to examine the unique (or differential) interaction effects of race/ethnic categories by individual caregiver relationship status typologies on precocious life events and mental/physical health outcomes, and the interaction effects of race/ethnicity and precocious life events on later mental/physical health outcomes. First, using the complex procedure in order to adjust for the complex sample design, race/ethnicity categories and relationship status typologies were multiplied to create a series of new variables. This set of new variables were then used as independent variables for predicting
precocious life events (after controlling for main effects and family demographics) and later mental/physical health outcomes (after controlling for main effects of family demographic control variables, race/ethnicity, relationship status typologies, and the direct/indirect influences of precocious life events). The moderating effects for race/ethnicity by relationship status typology were evaluated for each mental/physical health outcome separately. In sum, 20 interactions were tested for each mental/physical health outcome as well as precocious life events. Thus, the current study used a Bonferonni correction and interactions were deemed significant at the .01 level in order to account for the larger number of hypothesis tests.

The second step in the moderation analysis is to estimate the interactions between racial categories and precocious life events on each mental/physical health outcome at Wave 4. This was done by multiplying race/ethnicity by the precocious life events index. This created new interaction variables that were then independent variables which then predicted later mental/physical health outcomes after controlling for all pathways in the fully operationalized model. The estimation of this model was done using the type=complex procedure in order to take clustering into account. A total of 5 interactions of race/ethnicity by precocious life events were estimated for each mental/physical health outcome variable. The cut-off criterion of alpha = .01 was used in this interaction tests as well in order to control for a potential type 1 error.

**Results for Ethnicity by Relationship Status Typologies on Youth Mental/Physical Health**

In total, 14 significant interactions were documented. Figure 22 visually displays the interactions for systolic and diastolic blood pressure. Figure 23 displays the significant interactions for pulse rate and mean arterial pressure. Figure 24 displays the significant interactions for race/ethnicity by relationship status typologies on depression, and Figure 25
displays the significant race*relationship status typologies interactions on BMI at Wave 4. First, the results (as visually seen in Figure 22) revealed a significant African-American by never-married interaction ($\beta = .02, b=3.32, t = 3.78, b_0=124.55$) on systolic blood pressure. This finding means that participants that were African-American, compared to Caucasians, documented a 3.32 unit increase in the level of influence from having caregivers that never-married on systolic blood pressure after controlling for all other associations. Second, significant Hispanic-American by transitional caregivers ($\beta = -.03, b = -3.44, t = -3.98, b_0=79.09$) and African-American by never-married ($\beta = .02, b=2.90, t = 3.71, b_0=79.09$) significant interactions on diastolic blood pressure were observed.

Figure 23 documents the significant interactions between race/ethnicity and relationship status typologies on pulse rate and mean arterial pressure. First, a significant interaction was found between African-Americans (with respect to Caucasians) and never-married caregivers (with respect to consistently married caregivers) on later pulse rate ($\beta = .03, b=2.95, t = 3.97, b_0=73.94$) after controlling for all other associations. This can be interpreted as: African-Americans, with respect to Caucasians, experience a 2.95 unit increase in the level from the influence of having never-married caregivers on later pulse rate after controlling for all other associations. Second, Figure 23 displays significant interactions between African-American by the transitional relationship typology ($\beta = .04, b=3.26, t = 3.81, b_0=73.94$) on later pulse rate, Hispanic-American by the transitional relationship typology ($\beta = -.04, b = -3.64, t = -3.57, b_0=94.16$) on later mean arterial pressure, and Native Americans by never-married caregivers ($\beta = .04, b=7.09, t = 3.76, b_0=94.16$) on later mean arterial pressure.

Figure 24 documents the significant interactions between race/ethnicity and relationship status typologies on depression at Wave 4. First, a significant interaction was found between
African-Americans (with respect to Caucasians) and never-married caregivers (with respect to consistently married caregivers) on depression ($\beta = .05, b = 1.54, t = 4.02, b_{\theta}=6.04$) after controlling for all other associations. This can be interpreted as: African-Americans, with respect to Caucasians, experience a 1.54 unit increase in the level from the influence of having never-married caregivers on later depression. Second, Figure 24 displays significant interactions between African-American by the transitional relationship typology ($\beta = .05, b = 1.78, t = 4.70, b_{\theta}=6.04$) on later depression and a significant African-American by transitional relationship status typology ($\beta = .05, b = 1.78, t = 4.70, b_{\theta}=6.04$) on later depression.

Finally, Figure 25 documents the significant interactions between race/ethnicity and relationship status typologies on later Body Mass Index. First, a significant interaction was found between African-Americans (with respect to Caucasians) and never-married caregivers (with respect to consistently married caregivers) on later BMI ($\beta = .06, b=3.02, t = 4.43, b_{\theta}=28.83$) after controlling for all other associations. This can be interpreted as: African-Americans, with respect to Caucasians, experience a 3.02 unit increase from the influence of having never-married caregivers on later depression after controlling for all other associations. Second, Figure 25 displays significant interactions between African-American by the transitional relationship status typology ($\beta = .06, b=2.35, t = 3.65, b_{\theta}=28.83$) on later depression, African-American race/ethnicity by caregivers that divorce early in the life of adolescents ($\beta = .04, b = 1.36, t = 4.04, b_{\theta}=28.83$) on later BMI, and an Asian/Pacific Island American by late divorced caregivers ($\beta = -.04, b = -1.71, t = -3.83, b_{\theta}=28.83$) on later depression.

**Summary.** In general, significant African-American by relationship status typologies were observed when predicting later mental/physical health outcomes. Moreover, these significant interactions elevated levels in youth mental/physical health outcomes with respect to
Caucasians. The most frequent interaction was an African-American by never-married interaction while an African-American by transitional caregivers was also prominently observed. In general, Hispanic-Americans and Asian/Pacific Island Americans documented a lessened influence of relationship status typologies of care-givers on youth precocious and mental/physical health with respect to Caucasians. Hispanic-Americans documented a diminished influence of the transitional relationship status typologies in comparison to Caucasians (which was similarly observed for Asian/Pacific Island Americans). Also, African-American and Native American by relationship status typologies interactions tended to amplify the influence of an adverse relationship status typology on later mental/physical health outcomes.

Results for Race by Relationship Status Typologies on Precocious Life Events

Figure 26 documents the significant interactions between race/ethnicity and relationship status typologies on offspring precocious life events. A significant interaction was found between African-Americans (with respect to Caucasians) and the transitional relationship status typology (with respect to consistently married caregivers) on precocious life events ($\beta = .04, b = .31, t = 3.97, b_{97}=.77$) after controlling for all other associations on precocious life events. This can be interpreted as: African-Americans, with respect to Caucasians, experience a .77 unit increase in the level from transitional caregivers on offspring precocious life events after controlling for all other associations. Second, Figure 26 displays a significant Hispanic-American by early divorced/separated caregivers interaction ($\beta = -.03, b = -.27, t = 3.71, b_{97}=.77$) on later offspring precocious life events.

Results for Race by Precocious Life Events on Wave 4 Mental/Physical Health
Figure 27 documents the significant interactions between race/ethnicity and precocious life events on Wave 4 mental/physical health outcomes. The precocious life events index was a continuous variable. In order to capture an interaction using a continuous variable, high and low categories were approximated by taking the mean and adding one standard deviation for the “high” value and taking one standard deviation below the mean as the “low” value (Cumsille, Bangdiwala, Sent, & Kupper, 2000). These values can then be added to the estimated parameter functions to visually represent an interaction. First, the results revealed a significant interaction between African-Americans (with respect to Caucasians) and precocious life events on pulse rate ($\beta = .04$, $b = 1.01$, $t = 3.78$, $b_0 = 72.82$) after controlling for all other associations. Since Caucasians were coded as 0, this interaction is examining whether the slope of this interaction is different from the intercept slope (which has a slope of 0 and is the mean). This can be interpreted as: African-Americans, with respect to Caucasians, experience a 1.01 unit increase in the level from the influence of low and high levels of precocious life events on Wave 4 pulse rate after controlling for race/ethnicity, relationship status typology, and family demographic control variable main effects. Second, Figure 27 visually displace the significant interaction between African-Americans and precocious life events on Wave 4 depression ($\beta = .06$, $b = .50$, $t = 5.01$, $b_0 = 4.092$).
Figure 22. Plot of interactions for race/ethnicity by relationship status typologies on systolic blood pressure and diastolic blood pressure
Figure 23. *Plot of interactions for race/ethnicity by relationship status typologies on pulse rate and mean arterial pressure*
Figure 24. Plot of interactions for race/ethnicity by relationship status typologies on depression
Figure 25. Plot of interactions for race/ethnicity by relationship status typologies on BMI
Figure 26. Plot of interactions for race/ethnicity by relationship status typologies on precocious life events.
Figure 27. *Plot of interactions for race/ethnicity by precocious life events on depression and pulse rate*
CHAPTER 5. DISCUSSION AND CONCLUSIONS

The purpose of this dissertation was to examine the links between relationship status typologies, race/ethnicity, disrupted transitions (as captured by precocious life events), and offspring mental/physical health outcomes within the life-course perspective and family stress/investment models. Specifically, the first objective was to establish and define relationship status typologies of primary caregivers, which has been largely ignored by previous research. The second objective was to evaluate how these typologies influenced precocious life events and offspring mental/physical health outcomes. The third objective was to investigate how race/ethnicity influenced precocious transitions and mental/physical health outcomes. Finally, the fourth objective was to examine potential moderating influences of race/ethnicity on the relationship between relationship status typologies (respectively) and mental/physical health outcomes (respectively). The current study adds to the broad array of studies that have examined the influence of marriage on precocious transitions and mental/physical health outcomes by specifically developing relationship status typologies and assessing their influence on precocious transitions/health outcomes while taking into account the community of origin. The following sections will discuss conclusions from hypotheses, as well as study implications and limitations.

Relationship Status Typologies and Youth Mental/Physical Health: Hypothesis 1

The current study addresses an important gap in the literature by specifically examining the influences of dynamic relationship status histories and adolescent/young-adult mental and physical health outcomes. The results of this study revealed that several relationship status typologies of caregivers influenced later offspring mental and physical health outcomes after controlling for race/ethnicity, family SES indicators, and adolescent/caregiver gender. First,
never-married caregivers positively influenced young-adult systolic blood pressure, diastolic blood pressure, pulse rate, mean arterial pressure, body mass index, and depression in their children (meaning higher levels in adverse mental/physical health outcomes). Second, transitional caregivers positively influenced diastolic blood pressure, pulse rate, mean arterial pressure, BMI, and depression in young-adult offspring. Third, early divorced caregivers positively influenced pulse rate and depression in young-adult offspring. Finally, late divorced caregivers exerted a positive influence on young-adult offspring depression.

Never-married care-givers. In general, never-married caregivers exerted a strong positive influence on mental/physical health outcomes (both in terms of strength of coefficients and the number of significant influences on health) with respect to consistently married caregivers. The chronic stressors experienced by the offspring from a consistent lack in resources may deteriorate mental and physical health outcomes (Wickrama, Conger, Lorenz, & Jung, 2008; Wickrama, Conger, Surjadi, & Lorenz, 2010). Consistently high levels of stress associated from the lack in financial, emotional support, and shared parenting that dual-parent family structures bring can reduce health outcomes through lessened wear and tear on bodily functioning over time from lowered levels of chronic stress or a heightened ability to adapt to chronic stress (Pearlin, 2010; Pearl, Schilder, Fazio, & Meersman, 2005). This finding is contradictory from other results from previous studies. For example, Amato (2010) argued that single-parenthood is a stable living environment and may not affect mental and physical health as severely as early/late divorced caregivers and transitional caregivers outcomes due greater coping skills with this chronic stress from this stable lack in resources. Adolescents may learn to cope with growing up in this environment thus reducing adverse health outcomes. However, the current study found that offspring from never-married caregivers are one of the most vulnerable
to elevated levels in adverse mental/physical health outcomes with respect to consistently married caregivers and other adverse relationship status typologies. Consistent with the cumulative advantage/disadvantage perspective, the accumulation of benefits associated with stability in the marriage-like relationship is non-existent in this group (Dannefer, 2003). Never-married caregivers lack support (financial, emotional, etc.) from a partner and thus, may focus on meeting survival needs as opposed to emotional/social needs of offspring as they develop. Youth growing up in this environment have no stable marriage-like relationship to model and receive no accumulation of benefits from marriage (such as higher self-esteem, coping, mastery, and self-efficacy (Brody & Flor, 1998; DeLeire & Kalil, 2002; Manning & Lamb, 2003). The chronic stress and lack in accumulated benefits would explain why experiences from this relationship status typology would be more vulnerable to more adverse mental/physical health outcomes later in the life of the offspring.

From a family stress/investment model perspective, the resources associated with single-parents may reduce effective parenting (or prompt poor parenting) thereby increasing the levels of chronic stress experienced by the offspring during development (Conger, Ge, Elder, Lorenz, et al., 1994; Conger & Donnellan, 2007). Specifically, single-parents have no significant other to share the responsibilities associated with parenting ultimately creating a chronically stressful environment for both the caregiver and the offspring (Lempers, Clark-Lempers, & Simons, 1989). Moreover, these caregivers have fewer resources to invest in social/human capital that could protect the offspring from the adverse influences associated with growing up in this relationship status typology (Conger & Donnellan, 2007). This reduction in investment capabilities may also reduce an offspring’s ability to cope with stress thereby eroding mental and physical health (Martin, Conger, Schofield, Dogan, et al., 2010). The cumulative wear and tear
on the body’s functioning from chronic stress and inability to cope with chronic stress may erode mental and physical health over time (Conger, Ge, Elder, Lorenz, et al., 1994) and would explain the current study’s findings regarding the health-related vulnerabilities associated with never-married caregivers.

*Transitional care-givers.* The results of the current study revealed that frequent transitions in and out of marriage-like relationships can adversely influence mental/physical health outcomes with respect to consistently married caregivers. Compared to the other adverse relationship status typologies (outside of never-married caregivers), the transitional relationship status is marked by a chaotic home environment that is characterized by a least restrictive environment and poor parenting (Sprecher, 2002). The level of support from parents constantly changes and can elevate levels in chronic stress (Bruu, DiPiazza, Wang, Puttler, et al., 2009). Moreover, the lack in support from the primary caregiver and the revolving door of partners can adversely affect an adolescent’s ability to cope with the chronic levels of stress (Paczkowski & Galea, 2010). The cumulative advantages/benefits from this ever-changing family structure are minimal due to the primary caregiver focusing more on their individual needs/wants rather than on their children’s developmental outcomes (Yabiku & Gager, 2009). The stress from this environment created by transitioning caregivers provides little stability and few accumulated benefits due to a revolving door of partners/resources, thus negatively affecting physical/mental health functioning. The results of the current study concerning the vulnerabilities to adverse mental/physical health outcomes associated with the transitional relationship status typology are consistent with what the current literature in that the mental/physical health outcomes for youth growing up in such a chaotic home environment due to the frequent transitions eventually erode through stress processes (Pearlin, 2010; Windle & Zucker, 2010).
From a family stress/investment model perspective, the ever-changing resources associated with caregivers that frequently transition from partner to partner may reduce effective parenting (or prompt poor parenting) thereby increasing the levels of chronic stress experienced by the offspring during development (Conger, Ge, Elder, Lorenz, et al., 1994; Conger & Donnellan, 2007). The ever changing level of support from fluctuating partners and the focus of the caregiver being on themselves rather than the child may lead to chronic stress and little to no investments in social/human capital (Duncan & Magnuson, 2003). This reduced capital for youth from this adverse relationship typology may improve the likelihood of adverse coping mechanisms to stress. This previous research would explain why the current study found that children from the transitional relationship status typology are more vulnerable to adverse mental/physical health outcomes compared to consistently married caregivers and early/late separated caregivers which may be due to an inability to cope with stressors from eroded parenting and nominal investments in capital.

*Early/late dissolution.* The results of the current study revealed that early and late divorced/separated caregivers, in general, had a limited influence on adverse health outcomes (pulse rate was affected by early divorced/separated caregivers while late divorce/separated caregivers had no direct effects on physical health outcomes, while both significantly elevated levels in depressed mood). A possible explanation for this finding concerns the cumulative advantage perspective (Dannefer, 2003). Early and late divorced/separated relationship status typologies may have a differential level of accumulated benefits from the marriage or marriage-like relationship (Dannefer, 2003). For early divorced/separated caregivers, the level of accumulated resources (financial, emotional, mental, etc.) associated with time spent in the marriage or marriage-like relationship may be less compared to late divorced/separated
caregivers (Amato, 2010). For example, children growing up in home environments where the
caregivers divorce late in their life have had more time to model two caregivers and are more
likely to have caregivers share in parenting despite the dissolution (Cooper, McLanahan,
Meadows, & Brooks-Gunn, 2009). Moreover, early divorced/separated compared to late
divorced/separated caregivers may have fewer financial, emotional, or social resources available
to invest in their child’s development (Afifi, Cox, & Enns, 2006) resulting in higher levels of
chronic stress and reduced health in their children (Conger & Donnellan, 2007). Caregivers that
divorce early tend to be young and mismatched which can adversely promote the likelihood of
the father being absent in the life of the child (Astone & Mclanahan, 1991; Hogan, 1991). An
absent father can add to stress levels for mothers by increasing their role as the primary agent of
parenting, which can ultimately harm adolescent development due to a lack in accumulated
benefits from a stable male father figure (McLanahan & Sandefur, 1994).

The current study confirmed these explanations based on several results. First, late
divorced/separated caregivers failed to directly influence adolescent physical health outcomes,
and early divorced/separated caregivers adversely influenced pulse rate. Second, both early and
late divorced/separated caregivers significantly increased levels of depression. However, the
influence of early divorced/separated caregivers is much larger in magnitude (two times as large)
with respect to late divorced/separated caregivers. The cumulative advantage perspective
(Dannefer, 2003) and the duration in the marriage or marriage-like relationship (Amato, 2010)
would provide a logical explanation for the disparity between these two typologies.
Furthermore, with respect to never-married and transitional caregivers, the influence of children
developing in homes with early/late divorced caregivers is not as predominate on health
outcomes. It could be that the stressors associated with early/late separated caregivers are being exemplified through precocious life transitions rather than on health directly.

*Relationship status typologies and depression.* The most vulnerable health outcome for the current study was depression (mental health). The current study found that all relationship status typologies increased levels of depressed mood. The largest influence came from children growing up with caregivers that frequently transitioned from one caregiver to the next and single-parent homes. Adolescents developing in adverse family structures may be more likely to cope with the chronic stressors from life with limited or no support from caregivers (Amato, 2010; Elder, Johnson, & Crosnoe, 2003). However, due to the offspring’s duration of time developing in a dual-parent structure (late divorced/separated caregivers) the adverse influence on depression may be less compared to never-married caregivers, transitional caregivers, and early divorced/separated caregivers. This would argue for an accumulation of benefits from the duration spent developing in a dual-parent structure that has protected the offspring from depressed mood with a caregiver that divorces/separates late in their life. Conversely, there was an elevated level in depressed mood of offspring from late divorced/separated caregivers. This may be explained by the *crisis model* (Amato, 2000) where adolescents experience elevated depressed mood that may degrade over time. The results of the current study revealed that the relationship status typologies with the fewest accumulated benefits from the marriage or marriage-like relationships (never-married, transitional, and early divorced/separated caregivers) have the most adverse influences on later offspring depressed mood.

Furthermore, the literature documents that a dissolution can have more of a profound influence on youth mental health compared to physical health outcomes (Amato, 2000, 2005). Specifically, youth may be more vulnerable to depression due to the finding that youth may
internalize the dissolution and take responsibility for the separation between caregivers (Amato, 2000). Caregivers that are in an adverse relationship status typology tend to be less emotionally involved which can reduce the available support to the child (Repetti, Taylor, & Seeman, 2002). This lack in support and parenting places an added stress for youth as the primary agent for coping with emotions, life events, social experiences, and for their development (Repetti, Taylor, & Seeman, 2002). As adolescents develop, the deficiencies from caregivers low levels of involvement results in compounding stress through disrupted transitions. Moreover, disrupted transitions add further stress with fewer coping mechanisms to buffer these stressors resulting in a accumulated risk for mental health in particular (Repetti, Taylor, & Seeman, 2002).

The accumulation of many years of chronic stress may eventually wear down the body’s physiological functioning (such as heightened sympathetic-adrenomedullary and hypothalamic-pituitary-adrenocortical functioning) (Taylor, 2006). However, during young adulthood, the lagged effect from developing with a caregiver in an adverse relationship status typology may be less pronounced as the offspring’s body may be healthy enough to physiologically respond to the accumulation of stress (Repetti, Taylor, & Seeman, 2002). However, as the young adult develop into adulthood and midlife, the body may not be able to physiologically compensate for the high levels of chronic stress ultimately resulting in eroded cardiovascular functioning and an increased risk for other prominent chronic diseases (such as cardiovascular disease and hypertension) (Repetti, Taylor, & Seeman, 2002). Thus, during young adulthood, it is not surprising that the current study found a more pronounced effect for depressed mood compared to cardiovascular and metabolic functioning due to the age range of the sample (ages 26 to 32).

Summary. The current study, as expected found differential influence of relationship status typologies of caregivers on adolescent/young-adult outcomes. Never-married caregivers
and transitional caregivers were the strongest predictors of adverse youth mental/physical health outcomes. Consistently, the current study found that never married caregivers and transitional caregivers elevated levels in youth systolic, diastolic, and mean arterial pressure as well as BMI and depression. This consistent finding would favor the explanation that youth with never married and transitional caregivers may have higher levels of stress and less of an ability to cope with those stressors which can make them more vulnerable to adverse mental/physical health. Early and late divorced/separated caregivers increased the level of depressed mood, and as expected, early divorced caregivers were more vulnerable to an elevated level in depressed mood compared to late divorced/separated caregivers. The current study adds to the existing literature by examining the effects of relationship status typologies on mental/physical health outcomes by controlling for economic pressure indicators (such as occupational attainment, educational attainment, and income). This provides evidence that the stability and change in marriages or marriage-like relationships over time functions as a resource much like economic pressure (Conger & Donnellan, 2007; Duncan & Magnuson, 2003).

**Relationship Status Typologies and Precocious Life Events: Hypothesis 2**

The current study found that never-married caregivers, caregivers that transition from one marriage or marriage-like relationship to the next, early divorced/separated caregivers, and late divorced caregivers significantly elevated the level of offspring precocious life events (with respect to consistently married caregivers) after controlling for race/ethnicity, family SES indicators, and caregiver/adolescent gender. The current study found that never-married caregivers exerted the weakest effect in relation to the other adverse relationship status typologies. The transitional and early divorced/separated relationship status typologies exerted
the strongest effects on precocious life events while late divorce was slightly below these typologies in magnitude.

The differential influence of the adverse relationship status typologies is interesting for several reasons. First, the never-married relationship status typology was one of the most vulnerable to elevations in negative physical health outcomes compared to the other adverse relationship status typologies. However, compared to the effects of the other adverse relationship typologies, never-married caregivers had the weakest effect on precocious life events. Second, early/late dissolution and the transitional caregiver relationship typologies exerts a similarly strong influence on offspring precocious life events. Specifically, early and late divorce/separation displayed a nominal influence on offspring health. However, the results revealed that these relationship status typologies had a profound effect on precocious life events.

An explanation for these findings may be provided by Amato (2010). First, the stability in the relationship status may be a primary driving force for why early divorced/separated, late divorced/separated, and the transitional status are stronger predictors of offspring precocious life events. The transitional relationship status typology is the least stable of any of the relationship status typologies. As such, the stressors associated with that environment may be prompting adolescents/young-adults to prematurely leave that environment in order to reduce this chronic stress. Of all the adverse relationship status typologies, the home environment of never-married caregivers is the most stable in terms of consistency (though this stability may not be positive as was found in the previous section) (Amato 2000, 2010). Some adolescents may learn to adjust to this chronically stressful but stable environment, and may be more rational in life choices in order to improve their own capital (Manning & Lamb, 2003) thereby reducing precocious transitions whereas others may desire to leave that environment early by working full-time at a
young age, early cohabitation/marriage with partners (Wickrama, Wickrama, & Baltimore, 2010) or dropping out of high school (Jeynes, 2002). Never-married caregivers still exerted a significant effect which would provide evidence that the chronically stressful environment is forcing a premature transition into adulthood for some adolescents which dramatically influences stress levels as these adolescents may be ill-equipped to cope with the chronic stress and responsibilities of adulthood (Hatch, 2005; Maynard, 1996). However, the stability (despite chronically stressful stability) in the never-married relationship status typology for caregivers would explain why the influence is weaker compared to the other adverse relationship status typologies on offspring precocious life events and stronger than the other typologies for adverse mental/physical health outcomes.

The second explanation for why there was a difference in the influence of relationship status typologies on precocious life events compared to adverse mental/physical health outcomes could concern the timing of the divorce/separation and the divorce/separation occurring during a critical period in life (Conroy, Sandel, & Zuckerman, 2010). For the early divorce/separated relationship status typology, caregivers end their relationship just prior to the entrance into adolescence (or a critical period of development). This timing of divorce may disrupt the transition and proliferate into future disruptions thus increasing stress and deteriorating mental/physical health (Elder, Johnson, & Crosne, 2003; Elder, Modell, & Parke, 1993) as is posited by life-course theory (Bengston & Allen, 1993). For late divorce/separated caregivers, the timing of divorce may occur during the high school attending years (Wave 1). The elevated stress from this dissolution may deteriorate mental health (Amato, 2000) subsequently increasing the likelihood of dropping out of high school (Jeynes, 2002) and engaging in risky behaviors such as early sexual activity (early pregnancy likelihood thus increases) (Bachman, Wasworth,
O’Malley, Johnston, et al., 1997; LaVeist, Zeno, & Fesahazion, 2010; Wood, Goesling, & Avellar, 2007). The current study found a similar effect from caregivers that were classified in the early/late dissolution categories on offspring precocious life events and the timing/critical period explanation would provide sound reasoning as to why these effects were similar. However, given the timing/critical period explanation, the mechanisms through which early/late dissolution relationship status typologies influence offspring precocious life events are very different. For early divorced/separated caregivers, the mechanism is more congruent with a life-course theory explanation (Elder, Johnson, & Crosne, 2003; Elder, Modell, & Parke, 1993) while the late divorced/separated caregivers mechanism is more in line with what is proposed by a crisis model explanation (Amato, 2000).

**Race/Ethnicity and Youth Mental/Physical Health Outcomes: Hypothesis 3**

The current study found a differential influence of race/ethnicity on young-adult physical and mental health outcomes. First, the current study found that Hispanic-Americans tended to protect youth from adverse physical and mental health outcomes (outside of BMI). Hispanic-Americans place more of an emphasis on significant positive interactions with family members (Romero, Robinson, Haydel, Mendoza, et al., 2004; Velez-Pastrana, Gonzalez-Rodriguez, Borges-Hernandez, 2005). This provides more family support, more shared responsibilities in parenting, and an increased likelihood that couples will remain intact despite chronic stress (Romero, Robinson, Haydel, Mendoza, et al., 2004). The results of the current study provide evidence in support of the protective factors associated with a family emphasis on positive interactions. Second, the current study found that Asian/Pacific Island Americans documented a negative influence on youth adverse mental/physical health. This is consistent with what has
been found in previous literature. Asian/Pacific Island Americans tend to be more educated and have more resources available to them (such as financial and social) (Chao & Tseng, 2002; Sun & Li, 2007). This group places more of an emphasis on educational attainment and successful developmental transitions in children thereby reducing chronic stress and protecting the child from adverse mental/physical health outcomes (Chao & Tseng, 2002; Sun & Li, 2007). Current study results are consistent with previous research in that Asian/Pacific Island American race inclusion protected adolescents/young-adults from adverse mental/physical health outcomes.

Third, the current study also found that (in general) African-American and Native American racial/ethnic categories elevated levels of adverse health outcomes (such as elevated BMI, systolic blood pressure, diastolic blood pressure, mean arterial pressure, and depression). Previous research has documented that the most vulnerable ethnicity to BMI and depression are African-Americans (Burt, Barnes, Mcgue, & Iacono, 2008; Harris, Gordon-Larsen, Chantala, & Udry (2006)). Race/ethnicity implies a social history and day-to-day experiences that may differ from the majority group (Taylor & Turner, 2002; Williams & Harris-Reid, 1999; Williams, Spencer, & Jackson, 1999). As such, minority groups such as African-Americans and Native Americans may be more prone to structural and systematic day-to-day discrimination which can increase levels of chronic stress eventually degrading mental/physical health (Brody, Chen, Murry, et al., 2006; Spencer, 2001). The current study found that the strongest predictor of young-adult BMI was inclusion in the African-American racial category. This finding is consistent with what was found by Burt and colleagues (2008) suggesting that African-Americans are the most vulnerable to elevated depressed mood, physical inactivity, and obesity. Systematic and day-to-day experiences with discrimination may also, over time, increase levels of stress, reduce the ability to cope with the majority norms, roles, and rules, and vastly increase
levels of depression (Brown, 2003). The current study also found that both Native American and African-American ethnicities significantly elevated the level in depressed mood.

**Race/Ethnicity and Precocious Life Events: Hypothesis 4**

Consistent with previous research on race/ethnicity and precocious life events (Wickrama, Merten, & Elder, 2005; Williams, 1999), the current study found that race/ethnicity exerted differential influences on young-adult precocious transitions. Specifically, the current study found that African-Americans significantly elevated levels in precocious life events whereas Asian/Pacific Island Americans significantly reduced precocious life transitions. An explanation for this finding may be contained in stressful experiences associated with the social history of minority group inclusion and the normative timing of life events of adolescents growing up an ethnic minority group compared to those in the majority group that formulate the natural sequence of life events (Wickrama, Wickrama, & Baltimore, 2010). For minorities, the stressors related the structural and systematic day-to-day experiences with discrimination may increase social alienation, chronic stress, and depression compared to Caucasians (those in the majority group) (Harris, Gordon-Larsen, Chantala, & Udry (2006); Wickrama, Merten, & Elder, 2005). Moreover, African-Americans are at an increased risk to experience higher levels of systematic and day-to-day discrimination (Williams & Harris-Reid, 1999; Williams, Jackson, & Spencer, 1999). These increased levels of chronic stress, depressed mood, and social alienation may disrupt the normative timing of life events and increase the likelihood for early high school drop-out (United States Department of Education, National Center for Education Statistics, 2000) or increase the likelihood of engaging in risky behaviors such as substance early sexual activity (Cavazos-Rehg, Sptznagel, Bucholz, Nurnberger et al., 2010; Jordahl & Lohman, 2009).
Also, the normative timing of life sequences for African-Americans may be different than that of
the majority group resulting in a proliferation or compounding influence on a chain of precocious
transitions (Wickrama, Wickrama, & Baltimore, 2010). These explanations would explain why
African-Americans documented an elevated level in precocious transitions.

However, an interesting finding in the current study was that social histories associated
with Asian/Pacific Island American experience result in a reduced level in disrupted life
transitions (or precocious life events). According to research on race/ethnicity health disparities,
minority group inclusion should exacerbate precocious life events given the stressors associated
with discrimination and off-time normative sequencing with the majority group (Harris, Gordon-
Larsen, Chantala, & Udry (2006); Wickrama, Merten, & Elder, 2005; Williams & Harris-Reid,
1999; Williams, Jackson, & Spencer, 1999). Research has shown that, rather than relying on
social support for issues in adolescence/young-adulthood, Asian Americans rely on kinship
networks to drive an internalized mechanism for coping with stressful experiences from
discrimination/alienation (Taylor, Welch, Kim, & Sherman, 2007). As such, Asian Americans
may be more closely tied to caregivers and better able to internally combat chronic stress
resulting in fewer disrupted transitions/precocious life event. This would explain the negative
association that the current study found between being Asian/Pacific Island American and
precocious life events. Furthermore, this finding is consistent with previous studies (Wickrama,
Merten, & Elder, 2005) whereas no study to date has addressed this pathway after controlling for
the stability or change in relationship status over time of caregivers and community level
clustering in one succinct model.

Previous studies suggest that inclusion in a racial/ethnic minority will significantly
increase the likelihood of a precocious transition such as early high school drop-out and leaving
the home early (United States Department of Education, National Center for Education Statistics, 2000). However, the current study found that only African-Americans experienced an elevated level in precocious transitions, whereas Asian Americans documented a lower level in precocious life events. As such, the current study adds to the current knowledge base on race/ethnicity and precocious life events. Specifically, the current study was able to examine the differential influence of race/ethnicity on precocious life events rather than aggregating ethnicities into one composite categorical variable.

Precocious Life Events and Youth Mental/Physical Health Outcomes: Hypothesis 5

The findings of the current study are consistent with what has been found in previous research concerning the influence of precocious life events on offspring health outcomes. Specifically, Wickrama and colleagues (2005) found that higher levels of precocious transitions, after controlling for community disadvantage, significantly elevated the level of depressed mood. The current study extends this literature through the inclusion of a broader precocious life events index (as described in Wickrama, Wickrama, & Baltimore, 2010) that specifically captures age appropriate precocious transitions in which the offspring had aged enough.

Consistent with the life-course perspective and family stress/investment models, stressful experiences associated with family life can create distress in adolescents (Conger & Donnellan, 2007; Duncan & Magnuson, 2003; Elder, George, & Shanahan, 1996; Lempers, Clark-Lempers, & Simons, 1989). These stressors can disrupt transitions and force a rush to adulthood (Hatch, 2005; Maynard, 1996). The rush to adulthood can compound chronic stress experienced from the disrupted transition and the stress from the caregivers’ relationship status over time consequently increasing youth depressed mood (Wickrama, Merten, & Elder, 2005) and adverse
mental/physical health outcomes (Wickrama, Wickrama, & Baltimore, 2010). However, there is also literature that documents that youth develop with a wide array of divergent trajectories that are marked with varying levels of what it means to be on or off time (which results in varying levels of chronic stress from such transitions) (Schoen, Landale, & Daniels, 2007). Conversely, the current study found that relationship status typologies strongly influenced adolescent precocious life events and that these precocious transitions adversely influence youth mental/physical health. Despite the various definitions of on/off time transitions, the current study found that premature transitions adversely influence health which is consistent with the life course perspective (Elder, George, & Shanahan, 1996).

The current study adds to the literature on youth precocious life events and health outcomes in two ways. First, previous studies have controlled for relationship status as a time inverting covariate rather than controlling for dynamic changes in relationship status (marriage or marriage-like relationship) over time. Second, previous research has not estimated a model that examines mental/physical health outcomes as continuous outcome measurements (using biomarker data) with the inclusion of multiple health-related outcomes in one parsimonious model that controls for outcome associations.

**Mediational Role of Precocious Life Events**

The results of the current study add to the current literature by analyzing the mediating role of disrupted life transitions (captured through precocious life events) on the relationship between the stability and change in marriage/marriage-like relationships and mental/physical health outcomes. The results of the current study revealed that the direct effects of relationship status typology, in general, on youth physical health outcomes (such as systolic/diastolic blood
pressure, pulse rate, mean arterial pressure, and BMI) were no longer significant with the addition of precocious life events. According to Baron and Kenny (1986), the pathway that was once significant but now is not is argument for mediation. The results revealed that (after controlling for race/ethnicity, family SES indicators, and offspring precocious life events) that only never-married caregivers significantly influenced health outcomes and only transitional caregivers significantly influenced BMI. However, the direct effects from caregiver relationship status typologies still remained for depression after controlling for all other variables. The reduction of significant findings with the inclusion of precocious life events provides evidence in favor of the mediational role of precocious life events. Specifically, stressful experiences related to growing up in adverse relationship status typologies may increase the likelihood of a precocious life event (Pearlin, 2010).

These precocious transitions may place added stress on adolescents and could deteriorate later mental/physical health (Pearlin, Schieman, Fazio, & Meersman, 2005). In that manner, the current study argues that precocious life events are proximal processes of stress, and would explain the mediational influence of precocious life events in the relationship between caregiver relationship status typology and youth physical health. Specifically, chronic stress experienced by youth can disrupt the timing and sequencing of life events (Elder, George, & Shanahan, 1996), thus stress processes from developing in an adverse relationship status typology may be going through precocious life events rather than directly influencing physical health. The erosion of mental health is still documented despite the inclusion of precocious life events. This finding documents that youth may be particularly vulnerable to heightened depressive symptoms from the stressors of growing up in an adverse relationship status typology (Amato, Landale, & Havasevich-Brooks, 2008; Booth, Rustenbach, & McHale, 2008). The results of the current
study confirm that youth precocious life events are proximal processes for stress in which the influences from growing up in an adverse relationship status typology may go through these disrupted transitions to influence later negative physical health outcomes.

**Moderations for the Current Study: Hypotheses 6, 7, and 8**

The current study found several moderations in which race/ethnicity interact with relationship typologies to influence later offspring precocious life events and mental/physical health outcomes. Also, the current study found interaction effects of race/ethnicity by precocious life events on mental/physical health outcomes. These findings add to the current literature as no study to date has assessed the interaction effects of race/ethnicity by stability and change in relationship status over time of primary caregivers.

*Race/ethnicity by relationship status typologies on mental/physical health.* Previous studies have aggregated race/ethnicity into one categorical variable. First, the current study found that never-married, transitional, and early divorced caregivers had more of an adverse influence on physical and mental health outcomes for African-Americans (and Native Americans) compared to Caucasians. This may be attributed to the heightened systematic day-to-day discrimination that African-Americans and Native Americans experience with respect to Caucasians (Harris, Gordon-Larsen, Chantala, & Udry, 2006; Williams & Harris-Reid, 1999; Williams, Spencer, & Jackson, 1999). For example, the systematic and day-to-day stressors with daily life may compound with the stressors from developing in an adverse relationship status typology resulting in an adverse physiological response (or elevated systolic/diastolic blood pressure and higher BMI). Also, this finding may be attributed to the documented finding that African-Americans and Native Americans will reside in poverty (Williams & Harris-Reid, 1999)
and are more likely to never marry, divorce or separate early in the life of the partner, or frequently transition due to a lack of eligible male partners residing in highly adverse communities (Bradbury & Katz, 2002; Cutrona, Russell, Abraham, et al., 2003). Second, the current study found that the relationship between transitional caregivers and physical health outcomes tended to be less adverse for Hispanic-Americans and Asian American with respect Caucasians. For Hispanic-Americans, previous research documents that Hispanic-Americans place more of an emphasis on positive family interactions and developmental outcomes compared to Caucasians (Romero, Robinson, Haydel, Mendoza, et al., 2004; Velez-Pastrana, Gonzalez-Rodriguez, & Borges-Hernandez, 2005) As such, immediate and extended family members may be more involved in the life of adolescents which may protect the offspring from adverse physical health outcomes that may arise from the stressors of a change in relationship status (with respect to Caucasians). For Asian Americans, youth tend to place more of an emphasis on kinship networks than peer affiliations (Chao & Tseng, 2002). Youth from these families may experience more social support from families and are less reliant on peers for social support, which may protect youth outcomes by providing a stable network for youth to cope with the stress from when a relationship dissolution occurs. This is in line with the current study hypothesis (hypothesis 6).

*Race/ethnicity by relationship status typologies on precocious life events.* The current study found two significant interactions between race/ethnicity and relationship status typologies on precocious life events. The results revealed that the relationship between developing with transitional caregivers and youth precocious life events for African-Americans is elevated with respect to Caucasians. This finding could be the result of compounding chronic stress that may be exacerbated for African-Americans with respect to Caucasians. Research has documented
that the home life of transitional caregivers is highly chaotic with a least restrictive environment marked by few rules, limited emotional support, and adverse parenting experiences (Sprecher, 2002). Coupled with the chronic stress from structural and day-to-day discrimination experienced by being African-American, the chronic stress from growing up with a transitional caregiver may be multiplicative and overwhelming, thus serving as the driving force in the rush to adulthood in order to delineate chronic stress. The results also revealed that the relationship between early divorced caregivers and precocious life events in offspring is lessened for Hispanic-Americans compared to Caucasians. When a divorce or separation occurs in Hispanic-American families, the immediate and extended family may come together and share in parenting responsibilities in order to bring stability to the home environment thereby improving developmental outcomes in youth (Romero, Robinson, Haydel, Mendoza, et al., 2004). The increased emphasis on social support in these families may support on time development ultimately resulting in less perceived chronic stress from being off-time (Bengston & Allen, 1993). These explanations would explain the differential influence of race/ethnicity on the relationship between relationship status typologies and youth precocious life transitions. The results of the current study were consistent with what was expected (hypothesis 7).

*Race/ethnicity by youth precocious life events on later mental/physical health.* The current study found that race/ethnicity interacts with precocious life events to influence later mental/physical health in youth. Previous research has established that race/ethnicity interacts with community disadvantage to influence precocious transitions (Brewster, 1994; Wickrama, Merten, & Elder, 2005). Moreover, research has documented that the level of perceived racial segregation from main stream majority in the offspring can prompt precocious transitions (Brewster, 1994). The work of Brewster (1994) could provide an explanation as to why the
current study found that inclusion in the African-American race/ethnicity interacts with precocious life event to influence mental/physical health outcomes. Specifically, the current study found that African-Americans experience higher levels of depression and mean arterial pressure at low and high levels of precocious life events compared to Caucasians. Perceived racial segregation and chronic stress from systematic day-to-day discrimination would provide a justification for this result. Higher levels of perceived racial segregation and systematic day-to-day stressors may elevate levels of chronic stress (Williams & Harris-Reid, 1999) and youth may prematurely transition into adulthood by engaging in risky behaviors such as early sexual activity or drop out of high school in order to alleviate stress (Cavazos-Rehg, Sptznagel, Bucholz, Nurnberger et al., 2010; Jordahl & Lohman, 2009). The current study failed to find any other race/ethnicity by precocious life events interaction. This is slightly unexpected given what is known in the current literature about experiences with racial segregation and perceived stress (Brewster, 1994). However, hypothesis 8 was confirmed given the results that only African-American race inclusion significantly interacted with precocious life events.

The Fully Operationalized Model

The current study provided evidence that the most parsimonious model for evaluating the influence of relationship status typologies, race/ethnicity on precocious life events and adulthood mental/physical health outcomes. This model adds to the current literature on the relationships and health by examining an array of cardiovascular functioning indicators (such as systolic blood pressure, diastolic blood pressure, pulse rate, and mean arterial pressure), a general metabolic indicator (BMI), and mental health (captured through depressed mood) in one succinct model that takes associations between these outcome variables into account. After robust chi-square
difference tests, the most parsimonious model is the fully operationalized structural equation
model that incorporates the meditational pathways between predictors (relationship status
typologies and race/ethnicity) and physical/mental health. The findings of the current study
reveal that, in order to truly capture stress processes associated with developing in adverse
relationship status typologies, proximal process of stress (precocious life events) should be taken
into account when examining the direct influence of relationship status typologies on later health
outcomes. These findings are consistent with the findings from models that examined each
health outcome separately, as are documented in the current study, just more powerful in that
outcome associations and other significant relationships are taken into account.

**Family SES Indicators and Adolescent Gender**

Consistent with previous research, the current study found that family SES indicators
significantly predicted adverse mental/physical health outcomes (Wickrama, Merten, & Elder,
Specifically, the current study found that (in general) parental income, parental educational
attainment, and parental gender significantly reduced youth precocious transitions and
mental/physical health outcomes. The results of the current study can be attributed to the level
of resources associated with higher caregiver income and educational attainment. Families that
have higher human/social capital will investment more in their children’s capital through positive
interactions, support, and interactions (Conger & Donnellan, 2007). Moreover, families with
higher income and education are more likely to experience less economic pressure, less chronic
stress, and more positive parenting practices that can decrease adverse mental/physical health
outcomes and precocious transitions (Conger & Donnelan, 2007; Duncan & Magnuson, 2003).
An interesting study finding was that parental gender consistently influenced youth precocious life events and mental/physical health outcomes. Specifically, the current study found that, if the responding caregiver was female, then adolescents would experience fewer precocious transitions and adverse mental/physical health functioning. The male caregivers that responded were single fathers. This result could be explained by several factors. The attachment youths form with fathers may not be as strong with mothers, thus as the levels of chronic stress are elevated, youth may have fewer coping mechanisms to cope with this elevated stress level from the result of weak paternal attachment (Bowlby, 1969). Another explanation may be that the father is single due to the death of or separation from the relationship of the female caregiver. This type of loss may result in chronically high levels of stress proliferating in engagement in risky behaviors such as early sexual activity for youth (Amato, 2000).

Another interesting finding of the current study came from the strong influence of adolescent gender on mental and physical health outcomes as well as precocious life events. The current study found that females, compared to males, are more likely to have lower levels of cardiovascular functioning. The current literature documents that, in general, females have lower levels of systolic/diastolic blood pressure, mean arterial pressure, and pulse rate with respect to males prior to age 55 (Syme, Abrahamowicz, Leonard, Perron, et al., 2009). Rather than stressful experiences associated with gender, the found differences are more than likely the result of a well-established gender difference. However, the current study found that males experience elevated levels of precocious life events whereas females experienced higher levels of depression. Previous research has established that females may be more vulnerable to elevated levels of depression as they may have more chronic exposure to adverse life events (such as developing early compared to males) (Hankin & Abramson, 1999). Conversely, males may be
more prone to externalized behaviors such as early sexual activity in order to cope with stressors from their caregivers home environment/relationship status and may be more prone to transition prematurely into adulthood responsibilities (such as early child-bearing, early full-time work, and early marriage) (Cavazos-Rehg, Spitznagel, Bucholz, Nurnberger, et al., 2010 ). As such, the current study findings are consistent with previous research on socioeconomic status, parental gender, and youth health/precocious transitions (Mirowsky & Ross, 2003).

**Magnitude of Estimated Coefficients**

The current study found that caregivers’ relationship status history and youth race/ethnicity significantly and consistently influenced youth precocious life events and mental/physical health outcomes. However, the current study observed small \( \beta \) estimates concerning observed pathways. One concern is the issue that the significance of pathways is due to the large sample size involving Add Health. Specifically, large samples reduce standard errors which then narrow confidence interval bands (Schafer & Kang, 2008). The current study found very small standard errors, which pose a threat to the study findings. However, there is evidence against such a Type I error conclusion. Research has shown that the magnitude of regression based coefficients is much smaller in epidemiologically based studies compared with non-epidemiological based studies (Merlo, 2003). Moreover, assessing young adults that are generally in good health can also dramatically reduce the magnitude of \( \beta \) estimates concerning functioning estimators (Merlo, 2003).

There are several indications found in the current study that would suggest that the significance of study findings are not merely due to the large sample size. First, all hypothesized study associations are in the correct direction. This would provide evidence in favor of what has
been found in the literature. Second, the findings across all models are consistent in terms of what is significant and what associations are not. For example, the current study observed that across all mental/physical health models, never married and transitional caregivers exerted the strongest effect on mental and physical health outcomes. If study variables were simply significant because of the large sample size, study findings would not be in the correct direction nor would they be consistently significant in terms of appropriate predictors across mental/physical health models. Thus, despite the small magnitude of estimated parameters, they are theoretically important and mostly likely small in magnitude because of the relative good health associated with the sample being in the young adult developmental period (Merlo, 2003).

**Implications**

The current study found that relationship status typologies of primary caregivers influenced youth precocious life events and later mental/physical health outcomes. This finding has several theoretical and practical implications. This study demonstrated that never-married caregivers and caregivers that transition from partner to partner are the most vulnerable to adverse mental/physical health outcomes net of race/ethnicity and family SES indicators. As such, public policy and interventions can be designed to address youth that develop in these adverse relationship status typologies in order to protect youth outcomes. For example, Wisconsin has developed an innovative Wisconsin Works policy (Wisconsin Department of Children and Families, 2010) designed to improve the lives of children from families that may have little social support and are limited financially. This policy intervention has also enacted the Children First Program which is designed to provide job assistance to fathers that have little involvement with the family and are struggling to pay child support (Wisconsin Department of
Children and Families, 2010). This program is designed to increase father involvement and provide stable financial assistance to single-parent, divorced/separated caregivers, and caregivers that are transitioning from one caregiver to the next. This type of public policy initiative could reduce the chronic stressors associated with adverse relationship status typologies and could thus improve mental health, cardiovascular functioning (such as systolic/diastolic blood pressure), and reduce BMI thereby increasing the number of eligible partners for caregivers to marry. Public policy such as the Children First Program could reduce the chronic stressors of adverse relationship typologies by increasing the financial resources and levels of social support to families in which the father is not living with the child (such as single-parents, divorced caregivers, or transitional caregivers). The implementation of such public policy initiatives for states that are prone to highly adverse communities with high levels of ethnic heterogeneity could also reduce the chronic stress associated with structural and systematic day-to-day discrimination thereby improving mental/physical health outcomes in these communities thereby promoting stable and supportive interactions between parents and children regardless of relationship status history.

A broader implication for the current study involves the identification of children from adverse relationship status typologies and vulnerable race/ethnic groups for the purposes of improving involvement in positive youth development programming (Bradshaw, Brown, & Hamilton, 2006). Positive youth development programs are designed to improve developmental outcomes by structuring activities to promote a supportive environment with members of the community (Bradshaw, Brown, & Hamilton, 2006). Youths that experience chronic stress associated with the home environment (i.e., with relationship status typologies) and race/ethnicity can positively grow through activities that promote internalized self-esteem, self-
worth, social support, self-identity, positive social connections, and empathy with others that share similar experiences (Hamilton, Hamilton, & Pittman, 2004). Through positive youth development, the chronic stressors associated with growing up with caregivers in adverse relationship status typologies or minority group inclusion could be buffered by establishing a stable social support system with others as well as learned internalized coping mechanisms through these stable interactions (Bradshaw, Brown, & Hamilton, 2006). From a life-course perspective, effectively implementing positive youth development during early adolescence could reduce later precocious life events thereby improving mental/physical health. Moreover, positive youth development programming could buffer the multiplicative adverse interaction effects associated with race/ethnicity and relationship typologies. For example, African-Americans from single-parent families could potentially see dramatic improvements in mental/physical health outcomes (such as lowered BMI, depression, and improved cardiovascular functioning). Majority group inclusion in positive youth programming could also improve empathy and improve sustained positive interactions in the community, thereby reducing structural and day-to-day systematic discrimination associated with minority group inclusion. Moreover, youth that grow up with consistently married caregivers could interact with youth that grew up in an adverse relationship status typology in order to bring supportive relationships to their lives, which may pass on some of the accumulated benefits from marriage.

The current study findings also have an implication for interventions designed for educators. Recent educational research has found that school involvement has little influence on high school completion (a prominent precocious life event) (Anguiano, 2004) for youth. Currently, educators identify youth that are at-risk for dropping out through tracking academic progress, school attendance, and behavioral problems (Anguiano, 2004). Educators could extend
the empirically based evidence from cognitive behavioral therapy research (Sukhodolsky & Ruchkin, 2004) and design interventions that address thoughts, feelings, and behaviors of the chronic stressors experienced by at-risk youth. For example, educators could design an intervention that supports the youth with an achievable school success plan in which step-wise goals are achieved whereas negative thoughts, feelings, and behaviors are slowly buffered by this stable supportive environment. In that manner, schools could function much like the family unit and buffer precocious life events thereby reducing later disrupted transitions and subsequent adverse mental/physical health outcomes through supportive and stable interactions. Educators could work with at-risk youth on the identification of their thoughts and feelings around dropping out of school early in order to create an education plan that promotes school achievement. This type of intervention is supported by the finding that family structure and interaction processes are the strongest predictors of high school completion (Anguiano, 2004).

**Limitations of the Current Study and Recommendations for Future Research**

The current study addressed several methodological issues and limitations found in previous research. Specifically, the current study used a nationally representative sample and longitudinal design using prospective and retrospective data to address the hypothesized causal model. Furthermore, the inclusion of youth biomarker in which a trained-interviewer assessed cardiovascular functioning and BMI improved addressed the methodological limitations associated with self-report measures of physical health outcomes. The current study incorporated a sample that contained all racial/ethnic groups and a wide range of socioeconomic statuses that are present in the United States today. As such, systematic bias that can come from studies that incorporate few racial/ethnic groups is not present in the current study. Previous
research has treated marital or relationship status as a time invariable covariate, however the current study addresses these limitations in previous research by developing relationship status typologies and assessing their influences on youth precocious life events and mental/physical health outcomes. Finally, previous research has typically assessed the influence of precocious transitions on single health outcomes rather than a broad spectrum of health outcomes (Wickrama, Wickrama, & Baltimore, 2010). However, the current study addresses this gap by analyzing cardiovascular functioning, BMI, and depression in one succinct model.

In general, the results of the current study were consistent with study hypotheses. However, there are some limitations that may narrow the generalizability of results to broader concepts. The first limitation concerns the retrospective self-report measures that were used to establish inclusion of caregivers into relationship status typologies. Caregivers were asked to self-report on their relationship status (married, in a marriage-like relationship, year of divorce/separation, and how many marriage-like relationships they have had) over an 18-year period prior to 1995. Participants may struggle to remember the exact year of a dissolution which could disrupt inclusion into early or late divorced categories. Future studies should incorporate these limitations by specifically asking relationship status prospectively (from Wave to Wave) rather than by relying on retrospective reports over lengthy time periods. This could improve the identification of caregivers into relationship status typologies.

Another limitation with the current study regards the interview questions that were asked concerning the status of a relationship over an 18 year period prior to 1995. These questions regarding relationship status did not distinguish between marriage and marriage-like relationships. Research has shown that the difference in benefits received from marriage and cohabitation on well-being are more similar than different (Bumpas & Lu, 2000). However,
research has documented a difference in chronic stress and health for caregivers between married or cohabitating caregivers (Musick & Bumpass, 2006), though these differences are slight. The current study could not distinguish between married caregivers and cohabitating caregivers. Future studies should design interview questions and items that can directly assess whether the caregiver is in a cohabitating or married relationship in order to document potential influences on precocious life events and health outcomes. Specifically, the current study failed to find a study that investigated the influence of cohabitating versus married caregivers on precocious transitions. Understanding this pathway could pave the way to new policy and interventions that could be designed to promote marriage in order to improve developmental outcomes (such as on-time development).

Another limitation in the current study involves some differences in what was assessed at Wave 1 (1995) and Wave 4 (2008). First, biomarker data were not collected for youth BMI and cardiovascular functioning. Thus, the current study could not control for initial levels and potential lagged effects from Wave 1 for cardiovascular functioning in particular. As such, the current study controlled for potential lagged effects for general health at Wave 1. Future studies should incorporate effective planning in order to control for potential lagged effects that may exist in health measures from the original Wave 1 assessment. Also, the current study used biomarker data to assess BMI. However, at Wave 1, only self-reported BMI was available. Thus, we are only partially controlling for the lagged effect of initial BMI. Another issue in data collection was the assessment of caregivers. Caregivers were only assessed at Wave 1. Future studies could incorporate multiple waves of caregiver data collection in order to more precisely capture parental concepts such as interaction quality, economic pressure (or financial strain), and relationship status typologies. Moreover, studies that have longitudinal designs for both
adolescents and offspring could provide multiple measures separated by time that would be ideal for growth curve modeling and more precisely estimating intergenerational transmission of stress, cognitions, and behaviors.

Another limitation of the current study concerns race/ethnicity and potential generational differences that may exist. Previous research documents that youth are first-generation immigrants and second-generation immigrants (born from parents that immigrated to the United States) are at an increased risk for poverty, social segregation/isolation, chronic stress, and lower levels of social support (Cruz, 2009). However, the current study could not differentiate whether youth were first-generation, second-generation, or from families that have assimilated into the culture. Families from first and second-generation immigrants are at an increased risk for divorce/dissolution due to social alienation and chronic stressors from the assimilation process and youth from these families may be more at-risk for adverse mental/physical health problems (for example, limited access to health care/information due to financial strain) (Cruz, 2009). Moreover, families from first and second-generation immigrants may live in highly adverse communities that may not support marriage which can have deleterious effects on successful transitions during adolescence and poor health outcomes (Cruz, 2009). Future research should focus on potential generational racial/ethnicity differences that may exist and how these generations interact with marriage over time.

Another limitation in the current study is that certain variables and relationships were not assessed as they were beyond the scope of the current study. The current study took into account community level clustering when estimating pathway coefficients. Community level adversity/disadvantage was not included in the current study (Wickrama, Merten, & Elder, 2005). Also, individual characteristics of adolescents were not assessed. These characteristics
could potentially buffer the relationship between relationship status typologies and youth precocious life events/health outcomes. Specifically, internal characteristics such as high levels of conventional values, mastery, self-worth, self-esteem, and self-efficacy (as well as adolescent age/gender) could potentially diffuse the influence of adverse relationship status typologies and race/ethnicity on youth precocious transitions as well as mental/physical health. Future studies could also address whether the inclusion of individual characteristics of youth create a spurious association between precocious life events and young-adult health (Wickrama, Wickrama, & Baltimore, 2010). Furthermore, future studies could examine whether the inclusion of individual characteristics can cause a spurious association between relationship status typologies and precocious life events.

The current study evaluated the influence of relationship status typologies on health outcomes. However, one limitation concerns the health outcomes related to body mass index. The current study aggregated all individuals to assess BMI. However, research has shown that there may be a theoretical difference between those with low BMI (less than 20) and those with a high BMI (greater than 35) (Romero-Corral, Montori, Somers, Korinek, et al., 2006). Specifically, research has shown that individuals with low BMI are at an increased risk for mortality and cardiovascular disease compared to other BMI levels (Romero-Corral, Montori, Somers, Korinek, et al., 2006). Those with high BMI levels are at an increased risk for cardiovascular disease, but their risk for mortality is smaller in magnitude compared to those with low levels of BMI (Romero-Corral, Montori, Somers, Korinek, et al., 2006). Furthermore, a potential limitation to the study finding that adverse relationship status typologies elevated later offspring BMI concerns neglect. Research has shown that neglect in families is a strong
predictor of low BMI (Bennett, Wolan, Thompson, & Lewis, 2010) but only a moderately strong predictor for high levels in BMI (Bennett, Wolan, Thompson, & Lewis, 2010).

According to Barrett and Turner (2005), adverse relationship status typologies are more prone to victimization and neglect. It is possible that influence from youth developing with a caregiver in an adverse relationship status typology is more pronounced for lower and higher levels of BMI with respect to those in the normal range. Moreover, the influence adverse relationship status typologies may be much larger for lower levels of BMI compared to higher levels of BMI (Romero-Coral, Montori, Somers, Korinek, et al., 2006). As such, individuals with low BMI may be more vulnerable to the stressors from caregivers’ adverse relationship status typology and are at an increased risk for major depressive and eating disorders (Barrett & Turner, 2005). Conversely, those with high BMI may be over-eating to cope with the chronic stress from caregivers’ adverse relationship status typology (Romero-Coral, Montori, Somers, Korinek, et al., 2006). However, there could be a potential difference in the degree to which stressors from caregivers’ adverse relationship status typology where offspring with low BMI may document a more pronounced influence with respect to offspring with high BMI whereas those with moderate BMI may have a nominal influence. This potential moderating influence may limit the generalizeability of the current study. Future studies could investigate the potential moderating effects of low, moderate, and high BMI on cardiovascular functioning to increase the generalizeability of the current study.

Finally, the current study used an index that aggregated precocious life events as an indicator of proximal sources of stress. However, the stressors associated with each precocious life event may be different. Specifically, certain precocious life events may be more stressful compared to others. Research has shown that leaving the home early is a strong predictor in
increasing the likelihood of hypertension and diabetes whereas early sexual activity has no influence on the risk of these health complications (Wickrama, Wickrama, & Baltimore). Furthermore, early full-time work and dropping out of high school may be more prominent influences on youth mental health and physical health compared to other precocious life events such as early sexual activity and early marriage (Wickrama, Wickrama, & Baltimore). As such, certain precocious life events may be more systemic in eroding mental and physical health than others. Future studies could examine how relationship status typologies, over time, differentially influence the likelihood of precocious life events in offspring.
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APPENDIX: IRB Approval

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Date: 2/23/2011
To: K.A.S Wickrama
2625 N Loop Dr, Suite 2500

From: Office for Responsible Research
Title: The National Longitudinal Study of Adolescent Health (ADD Health)

The Co-Chair of the ISU Institutional Review Board (IRB) has reviewed the project noted above and determined that the project:

☒ Does not meet the definition of research according to federal regulations.
☒ Is research that does not involve human subjects according to federal regulations.

Accordingly, this project does not need IRB approval and you may proceed at any time. We do, however, urge you to protect the rights of your participants in the same ways you would if IRB approval were required. For example, best practices include informing participants that involvement in the project is voluntary and maintaining confidentiality as appropriate.

Please also know that any change to this project must be communicated to the IRB to determine if the project has become research with human subjects requiring IRB approval.
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