CHILDHOOD PRECURSORS OF ADULT SOCIAL CAPITAL INDICES

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ABSTRACT

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Objective. Social capital is generally defined as an individual’s potential for tangible or social resources made available via interpersonal connections. Higher levels are related to a variety of positive health, well-being, and occupational outcomes. Social capital can be measured by a variety of indices in adulthood. Currently, the childhood precursors to adult social capital are relatively unknown. The current project tests a developmental-contextual model for both the measurement of social capital in adulthood and the childhood precursors that may impact its accumulation over the life course. Methods. 523 participants were surveyed at age 8 and again at age 48 as part of a 40-year prospective, longitudinal study. Participants completed measures of cognitive abilities, relationships with parents, peers, and spouses, information about personal traits, and beliefs and attitudes regarding social relationships. Structural Equation Modeling (SEM) was used to test the hypothesized model. Results. The proposed measurement model of social capital was generally supported, with latent domains of individual, interpersonal, socio-economic, and community level indices. Predictive models of childhood precursors for social capital differed by gender: prominent precursors were childhood aggression and cognitive ability for males, and childhood family religiosity for females. Conclusions. These findings suggest that a developmental-contextual model of social capital may account for the multiple indices of social capital and that its accumulation across the life course is different for males and females. Knowledge of precursors may be clinically helpful for fostering social capital growth in therapeutic settings.
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INTRODUCTION

Social capital is generally defined as an individual’s potential for resources made available through social connections to other individuals and groups. These resources are conceptualized as accessibility to material resources, information or insight, goodwill in the form of sympathy, trust, and forgiveness, as well as general social-emotional support (Adler & Kwon, 2002; Fulkerson & Thompson, 2008; Onyx & Bullen, 2000; Portes, 2000; Putnam, 1995; Woolcock & Narayan, 2000). The social capital literature reviews issues regarding the definition, mechanisms, measurement, and overall utility of the social capital construct (Adler & Kwon, 2002; Fulkerson & Thompson, 2008; Onyx & Bullen, 2000; Portes, 2000). However, there is general agreement that the definition presented above is preferred by a majority of researchers (Fulkerson & Thompson, 2008) and the potential for increasing the utility of the social capital construct through continued empirical study is well supported (Bjornskov & Sonderskov, 2013; Lochner, Kawachi, & Kennedy, 1999; Mancinko & Starfield, 2001).

Several studies have demonstrated that multiple indices of social capital (which span individual-personal, interpersonal, socio-economic, and community resources) are related to a variety of positive outcomes, including better health, fewer lifetime behavior problems, greater occupational success, fewer depressive symptoms, and improvements in general well-being and functioning (Bassett & Moore, 2013; Englund, Kuo, Puig, & Collins, 2011; Gilbert et al., 2013; Growiec & Growiec, 2010; Kawachi, Kennedy & Glass, 1999; Mohnen, Groenewegen, Volker, & Flap, 2011; Pettit, Erath, Lansford, Dodge, & Bates, 2011; Runyan et al., 1998; Wright & Fitzpatrick, 2006). Although the impact of the availability of social capital has been evaluated, fewer studies have explored its predictors or precursors. A majority of the available studies are conducted with adolescents and adults, with only a few exploring longitudinal precursors from
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childhood onward. Additionally, few of these studies utilize the term “social capital” itself, and focus instead on precursors for specific subsets of social capital indices. Overall, research suggests that indices of adult social capital may be preceded by a variety of childhood and adolescent variables, including some indices of social capital itself during childhood. These include individual traits of intellectual ability and personal morality that foster positive relationships, quality and quantity of peer relationships, family level socioeconomic status and child-rearing contextual factors, and community involvement of both the family and the child (Conger, Conger, & Martin, 2010; Cummings & Davies, 2002; Englund et al., 2011; Leonard, 2005; Mcloyd, 1998; Putnam, 1995; Pulkkinen, Nygren, & Kokko, 2002; Waters, Merrick, Treboux, Crowell, & Albersheim, 2000).

In this master’s thesis, I will begin by summarizing literature that describes the theoretical conceptualization of social capital (with a focus on aspects of social capital that I plan to examine in my research), the significance of social capital as a research construct, and review how it has been measured in the literature. A developmental-contextual model will provide theoretical support for the precursors and indices of social capital utilized in this thesis project. Next, I will review literature on variables that are precursors to social capital, focusing on empirical research that has examined childhood and adolescent precursors of later social capital. Finally, I will describe and discuss the results of my project, which utilizes a 40-year prospective, longitudinal study of a sample of youth starting at age 8 to explore potential childhood individual and contextual factors that predict adult levels of social capital at age 48.

Theoretical Conceptualization of Social Capital

Although social capital has gained popularity as a research term in recent years, the idea that individuals receive potential for benefits due to the nature of their social connections has
been studied by sociologists long before the conception of such a widely used label (Portes, 2000). As the construct has accumulated traction both within and beyond the field of sociology, interest in quantifying social capital with a useful operational definition with theoretical basis and practical application appears to have expanded in the literature as well.

Network theory in social science research provides a foundation for the construct of social capital by suggesting that the unique collection of social ties an individual accumulates leads to the construction of a social network that confers the individual certain opportunities. Social network theorists focus on mapping types of social connections that occur between individuals and uncovering the mechanisms for how information flows between points in a network (Borgatti & Halgin, 2011). Social capital expands on this theory by conceptualizing the potential for resources that are made available to individuals and groups through not only the number of connections in their social network, but also the quality of these connections.

**Multidimensional Definitions**

Meta-analysis exploring the evolution of social capital in sociology literature found that the construct has been rapidly gaining interest in recent decades. Between the years of 1996 and 2006, the percentage of sociological research articles published on the topic of social capital increased from .2% to nearly 1.5 % (Fulkerson & Thompson, 2008). Additionally, Mancinko and Starfield (2001) found that 28 out of 31 books published on the topic of social capital were published in a span of just 5 years, from 1996 to 2001. The term social capital has been utilized mostly in sociology, but also in economics, industrial/organizational psychology, community psychology, and health psychology research (Bjornskov & Sonderskov, 2013; Fulkerson & Thompson, 2008; Gilbert, et al., 2013; Kawachi, Kennedy, & Glass, 1999; Portes, 2000).
Given its variability in use, a host of different ideas for what exactly constitutes social capital exists both within and between fields. Meta-analysis has identified 18 definitions of social capital in use throughout social science research spanning from 1988-2006 (Bjornskov & Sonderskov, 2013). Several researchers have identified debate in the literature on how best to define and operationalize the construct of social capital (Adler & Kwon, 2002; Bjornskov and Sonderskov, 2013; Fulkerson & Thompson, 2008; Leonard, 2005; Onyx & Bullen, 2000; Portes, 2000). Bjornskov and Sonderskov (2013) and Portes (2000) attribute this debate to the over-inclusive nature of some social capital definitions that have diminished construct validity and ultimate utility by creating too much overlap with co-existing terms. This debate has led some researchers to identify social capital as a “term currently in transition” (Fulkerson & Thompson, 2008, p.539) rather than a precisely defined paradigm. The meta-analysis by Fulkerson and Thompson (2008), however, suggests consensus in that a majority of researchers conceptualize social capital as a multi-dimensional aspect of social network structure where qualitative features of social connections such as trust, reciprocity, and cohesion, engender the potential for benefits to be received. For purposes of consistency, this common conceptual definition will be utilized by this master’s thesis for the purpose of creating a measure of social capital.

Using a Developmental-Contextual Model of Human Development to Organize Indices and Precursors of Social Capital

Throughout research, there are a variety of methods proposed for measuring social capital and the multi-dimensional nature of the construct complicates formulation of a single comprehensive measure. In addition, precursors of social capital are not often studied by utilizing the term itself, but rather by focusing on factors that lead to development of specific indices of social capital. For my master’s thesis, I implement a multi-faceted theoretical model as
a guide for organizing the relationship between childhood and adolescent precursors of various social capital indices.

Contemporary theories in psychology acknowledge that human development does not take place within a single dimension of life, but rather in the context of many intersecting variables. It is proposed that this interaction then leads to an individual’s unique development. This movement in the field has given rise to a variety of multidimensional models that aim to more accurately represent the scope of human experience by including multiple paradigms in measures and constructs. The developmental-contextual theory in particular categorizes human experiences into two general levels of organization: Individual and Contextual. This model integrates the innate experiences and perspectives of individuals with their unique contextual experiences within their families, communities, and cultures. This approach provides a more inclusive method for exploring human development and the processes of change that occur over the life span. These two aspects of human life interact with each other and contribute to change collaboratively (Lerner, 1998).

Bronfenbrenner’s (1999) nested ecological model is a relevant example of a specific developmental-contextual theory that takes into account multiple levels of the human experience. In this model, the experience of self is impacted by a series of continually expanding environmental groups each nested within one another: the family and peer group lie within the context of the school and neighborhood community, and these in turn lie within the context of a specific culture or nation.

When exploring social capital and its precursors over the life-course, a developmental-contextual approach accounts for the dimensionality both within the construct and the early life factors that proceed or contribute to social capital formation in adulthood. A nested approach can
be taken to organizing the multi-dimensional indices of social capital where both contextual and personal experiences work together and within each other to increase the potential for resources a person has access to by virtue of their social connections. This proposed model of social capital precursors and indices is represented in Figure 1. The specific variables included within each of these levels are explored in more detail in the following sections.

Figure 1. Developmental-Contextual Model: Precursors and Indices of Social Capital
Measurement of Social Capital Indices

Several research studies have attempted to formulate concise, comprehensive, and multidimensional collections of adult social capital indices that capture the complexity and usefulness of the term (Brehm & Rahn, 1997; Onyx & Bullen, 2000; Woolcock & Narayan, 2000). When looking at these multi-dimensional models, the measurement options proposed can be categorized in a developmental-contextual model. These types of models generally appear to use some combination of the following variables: personality traits which impact sociability or access to resources (individual-personal level); quantity of social relationships, prosocial reciprocity and trust, and level of connectedness (interpersonal level); and self-reported norms, feelings of trust and reciprocity in a neighborhood context, civic engagement, and more general community involvement (community level). These variables are often measured by self-report.

Other studies have included socio-economic status variables such as education level, occupation, and income when measuring social capital. These variables may be important given the direct connection they have to obtaining tangible and social resources. Some researchers have used these variables in an attempt to implement more objective measurements of social capital in their studies, particularly through the use of name and position generator software. With this approach, social capital can be estimated with a prestige-based score (derived from the number of connections a person has to individuals within careers of different prestige ranking). This quantifiable score is then combined with an individual’s self-reported perspective on neighborhood trust and his or her participation in community organizations and groups to improve the comprehensiveness of measurement (Bassett & Moore, 2013; Hill, Jobling, Polet, & Nettle, 2014).
Some studies have divided social capital into two categories defined by whether the resources accrue to the individual versus the community. For instance, Krist, Lazgare, Zhang, and Campo (2015) identified individual social capital as resources accrued by a single person for himself or herself, and community social capital as resources that are available collectively for all members of a group. Individual social capital was measured by interpersonal network factors, frequency of social contact, participation in community groups, and social support. Community (or neighborhood level) social capital was measured by collective efficacy, neighborhood problems, and neighborhood quality.

Several studies have examined variables at the community level of analysis alone. One such study explored the relationship between community social capital and both child behavior problems and general well-being (Delaney-Brumsey, Mays, & Cochran, 2014). In order to conceptualize social capital, several measures were combined, including scales of neighborhood efficacy (measured by levels of social cohesion and informal social control), the amount of familiarity between generations in the neighborhood, and the individual’s perspective of reciprocated actions. In another study exploring the impact of social capital on feelings of community success, Whitham (2012) conceptualized community level social capital as resources gained from both formal and informal settings. This included affiliation with structured organizations in the neighborhood and frequency of socialization at more unstructured common areas (e.g., shopping malls, bars, parks).

A few studies also make a distinction when measuring family social capital rather than social capital accumulated by one individual. Runyan, et al. (1998) calculated how many interpersonal and community level indices of social capital participating families possessed on a 5-point scale. These included having 2 parents in the family, having no more than 2 children, the
provision of adequate social support for children by parents, neighborhood support, and regular attendance to religious services. This approach is supported throughout literature on family level social capital and how benefits are conferred to family members by virtue of their communal connections (Chin & Phillips, 2004; Leonard, 2005; Runyan, et al., 1998).

In addition, researchers may further attempt multi-dimensionality by measuring social capital with several sources of report about resources available to the individual (self, peer, teacher, parent, spouse, etc.) and researchers’ observations of interpersonal relationships (Englund et al, 2011; Runyan et al., 1998; Wright & Fitzpatrick, 2006).

Overall, by exploring pre-existing multi-dimensional models of social capital in conjunction with measures used in other studies, a comprehensive model of social capital emerges. This model incorporates personal, interpersonal, socio-economic, and community level indices (model previously shown in Figure 1). At each level of the developmental-contextual model, there are a variety of sources that contribute to and can indicate the potential access to resources (i.e., social capital) that an individual has. Trends in the literature depict an ever-evolving process of creating social capital measurements that capture as many of the potential contributors to the construct in the most comprehensive manner possible. This approach will be utilized within this proposed master’s thesis when developing a measurement of social capital for adults.

**Correlates of Social Capital**

Accumulation of social capital is related to a variety of positive outcomes in individual and community level well-being. Research suggests that social capital correlates with subjective well-being and higher earnings, particularly when the social ties are with individuals outside of a person’s family (Growiec & Growiec, 2010). Additionally, having low levels of trust in others is
associated with a tendency toward higher levels of depressive symptoms, suggesting that individuals with more social capital (a critical component of which is social trust) may be less likely to experience negative affective symptoms (Bassett & Moore, 2013). Individual studies and meta-analyses alike have suggested that higher levels of social capital indices are related to improved health, both in terms of higher self-reported physical health and lower overall mortality (Gilbert et al., 2013; Kawachi, Kennedy, & Glass, 1999; Mohnen et al., 2011).

Longitudinal studies have also demonstrated the impact of social capital over time. Englund et al. (2011) reported results from the Minnesota Longitudinal Study of Risk and Adaptation, a longitudinal study with 157 participants, which followed a population of at-risk children from birth to adulthood. This research project found that social capital predicted positive development in adulthood. Englund, et al. (2011) indexed social capital by infant attachment security, competence with peers, and quality of the parental relationship in childhood. In particular, it was found that secure infant attachments and higher level of childhood interpersonal functioning (measured by teacher rankings of competence with peers) were related to better overall adjustment at age 28 (measured by psychological, social, and occupational functioning derived from a structured clinical interview).

Several studies also related levels of child and adolescent social capital to behavior problems both concurrently and longitudinally. For instance, Runyan et al. (1998) found that children in families with higher levels of social capital experience fewer behavior problems and developmental deficits. Family social capital was calculated in this study by adding up how many interpersonal and community level indices the family possessed on a 5-point scale. Characteristics included having 2 parents, no more than 2 children, adequate social support for children by parents, neighborhood support, and regular attendance to religious services (Runyan,
et al., 1998). These findings are further supported by Wright and Fitzpatrick (2006), whose research suggests that higher levels of parental support and involvement (family level social capital), religious participation, and strength of school connectedness in adolescence were directly associated with lower levels of interpersonal violence. Pettit et al. (2011) also found that individuals who had higher quality interpersonal relationships at age 22 experienced better outcomes in educational attainment and fewer behavior problems, arrests, and substance abuse issues at age 24.

**Childhood and Adolescent Precursors of Adulthood Social Capital**

As noted, social capital is a multidimensional construct with many indices spanning four levels of analysis (individual, interpersonal, socio-economic, and community), which makes it important to measure comprehensively. Relatively few studies have examined the long-term precursors of social capital itself; however, there are a variety of studies that explore the factors leading to the development of specific indices of social capital.

It is also important to note that some of these personal and contextual indices of adult social capital also occur earlier in life in the form of childhood social capital. Some researchers have conceptualized children’s social capital as limited to the confines of the family and community factors. These factors include family socio-economic resources, quality of the parent-child relationship, family structure (e.g., having fewer children and two parents in the household), community factors and involvement (e.g., belonging to organizations, level of trust and cohesion), relationships with peers, and social connections form working outside of the home (e.g., babysitting or a part time job) (Chin & Phillips, 2004; Leonard, 2005). Additionally, others have indicated that religious involvement of the family has the potential to improve the accumulation of childhood social capital (Fan, 2008; Ferguson, 2006). Other researchers have
shown that children’s development of moral emotions impacts the closeness and reciprocal nature of their friendships, suggesting that individual level factors are also important to consider. For instance, a longitudinal study of 585 children into adolescence found that those who were more conscientious and socially outgoing at age 12 had higher quality friendships at age 19 (Lansford, Yu, Pettit, Bates, and Dodge, 2014). Furthermore, a study by Jensen-Campbell, Adams, Perry, Workman, Furdella, and Egan (2002) found that agreeableness was also associated with more positive peer relationships in 206 middle school children and that these effects were consistent over the course of a school year.

Research regarding precursors to adult level social capital will be explored in more detail below. Ultimately, in reviewing the existing literature on childhood precursors of social capital indices, there emerge three levels of contributing variables supported by an ecological systems model: individual-personal, interpersonal, and community level precursors.

**Individual-Personal Level Precursors**

Individual level precursors to adult social capital may include childhood characteristics of personality and moral development, cognitive abilities, and academic abilities, as these traits contribute to the establishment of successful social relationships that confer a host of social benefits. When exploring this longitudinal connection, a study completed in Finland by Pulkkinen, Nygren, and Kokko (2002) found that childhood moral emotions, motivation levels, and academic abilities impacted adult socialization. Socialization was measured at age 36 by The Socialization Scale of the Karolinska Scales of Personality (Af Klinteberg, Schalling, & Magnusson, 1986; 1990), which explores a person’s self-concept of their own sociability in different contexts and time periods (e.g., “My parents have often disapproved of my friends,” “As a youngster in school I used to give the teacher lots of trouble,” “People often talk about me
behind my back”). Children who were rated by teachers as more competent at keeping calm, negotiating, and peacemaking with peers at age 8 and those who had higher academic motivation and GPA at age 14, experienced higher scores on the socialization scale as adults. It is important to note that child temperament and motivation factors were found to be significant predictors only in men, suggesting these outcomes may be moderated by gender (Pulkkinen et al., 2002). Despite these differential results, this initial longitudinal evidence suggests that both childhood cognitive ability/academic motivation and particular prosocial personality characteristics may improve social capital accumulation in adulthood, and the specifics of these connections will be further explored below.

In regard to cognitive abilities, a meta-analysis conducted by Murphy and Hall (2011) found that general intelligence level is positively related to successful social interactions. In particular, the meta-analysis focused on the relationship between IQ and interpersonal sensitivity, which is described as one’s ability to get an accurate reading of another individual’s traits or their current state experience. The authors found that across 38 samples in both children and adults, intellectual ability was positively correlated with interpersonal sensitivity.

When it comes to personality characteristics, prosocial and moral behaviors in particular appear to be important individual indices throughout social capital research. There have been several proposed precursors and predictors of adult prosociality from literature in child development. For instance, research by Eisenberg (1999) followed 32 preschool children into young adulthood, and found that prosocial behavior is relatively stable through development – children who are prosocial (i.e., exhibit behaviors such as sharing, helping, and comforting) tend to continue to be prosocial adults. This relationship was found to be mediated by the development of empathy and sympathy in adolescence. The relationship between feelings of
sympathy/empathy and prosocial behaviors is widely supported by theory and research (Eisenberg & Fabes, 1990; Eisenberg & Miller, 1987; Taylor, Eisenberg, Spinrad, Eggum, & Sulik, 2013; Roberts, Strayer, & Denham, 2014). Additionally, Eiseneberg (2014) further elaborated on this connection by exploring how prosocial behavior in preschool, adolescence, and adulthood is related to “Prosocial Moral Reasoning” (PMR): an individual’s ability to guide his or her social behavior using personal moral values. PMR is theorized to account for individual differences in prosocial behavior. In a later time point from the original 1999 longitudinal study, Eisenberg (2014) measured PMR by presenting individuals with vignettes depicting social dilemmas and evaluating the participants’ thought processes on proposed solutions for the characters. Results suggest that PMR levels are positively correlated with prosocial behavior in both adolescents and adults.

Another longitudinal study conducted by Caprara, Tisak, Allessandri, Fontaine, Fida, and Paciello (2014) proposed a predictive model where several personality characteristics are related cross-sectionally and longitudinally to a person’s predilection for aggressive (or non-prosocial) behaviors. Specifically, these categories of predictive behaviors were identified as irritability, hostile rumination (aggressive thinking), and moral disengagement. Moral disengagement in particular describes when an individual acts in a way that contradicts his or her values without feelings of guilt or the experience of cognitive dissonance. The results for the proposed model suggested that these characteristics interact in adolescence and persist overtime, and may in fact grow stronger as individuals internalize them. Ultimately, these behaviors, particularly moral disengagement, were related to an increased rate of physical altercations with others in adulthood.
Overall, this cumulative body of research suggests that there are several precursors to adult prosocial behavior (or a lack thereof) that stem from childhood, including: past prosocial behavior, feelings of empathy for others, prosocial moral reasoning, personal interpretations of others behavior, and moral disengagement. In the current study, available childhood measures reflecting moral reasoning are limited, but there are two elements theoretically embedded in many of these precursors that are available: feelings of guilt and confession of wrong-doing.

Guilt and confession are not the only precursors of positive social behavior development, but they may be of particular importance. One study by Ongley and Malti (2014) found that children who expressed emotions which demonstrate discord between the child’s behavior and their moral standards (i.e., feeling guilt, sadness, or feeling bad) were more likely to participate in sharing behavior with other children. However, it is important to note that this effect was not found when the children were also feeling sympathy (defined by this study as concern for others), as those feelings predicted pro-social behavior above and beyond feeling guilt, sadness, or feeling bad. This result was found in all three age groups studied: early childhood (mean age = 4), middle childhood (mean age = 8), and early adolescence (mean age = 12) suggesting longitudinal consistency (Ongley & Malti, 2014). In a young adult population, feelings of guilt also predicted prosocial behavior by increasing helping behavior in several situations: both publicly and anonymously, when emotional or crisis help was required, and when requested by others (Carlo, McGinley, Davis, & Streit, 2012). Additionally, Menesini and Camodeca (2008) found that children aged 9-11 who were prosocial (measured by peer nomination) were more likely to experience feelings of guilt and shame than children who were identified as “bullies” when presented with a hypothetical situation of being intentionally mean to a classmate. Another study conducted by Olthof (2012) found that adolescents who anticipate feeling guilty about
their behavior when imagining an adult seeing them showed increases in prosocial behavior and decreases in antisocial behavior, suggesting that these variables may be of specific importance for the development of prosocial behavior.

Ultimately, with proper socialization as a child, feelings of guilt appear to be traits children learn and keep throughout their adolescence, suggesting longitudinal relevance. These feelings also appear to be related to prosocial behavior at all ages and may impact social capital accumulation by improving quality of relationships across the lifespan. Although there are several other indicators of prosocial behavior and social development accounted for in the literature, as noted earlier, in the data set for my study, feelings of guilt and confessing to wrongdoing in children are the best available proxy measures for this construct.

**Interpersonal Level Precursors**

The potential for benefits to be conferred through interpersonal relationships is an essential aspect of social capital, and childhood variables that contribute to positive relationship formulation may be precursors to the accumulation of these connections in adulthood. Elements of childhood attachment, parent-child relationship factors, family dynamics, and socio-economic status as well as the quality of peer relationships, are all interpersonal level childhood variables that could precede adult access to social connections that confer resources (i.e., social capital).

Childhood attachment measured as far back as infancy can have an impact on adult social relationships. For instance, Waters et al. (2000) conducted a longitudinal study with 60 1-year-old infants and their parents recruited from birth announcements in 1975 and 1976. Follow-up sessions were conducted at 6 months and 20 years following the first measurement to record the infants’ experiences into adulthood. Results found that securely attached infants had higher rates of positive attachment to others in adulthood (Waters et al., 2000).
In addition to a positive parent-child relationship, other aspects of the child’s family context are also important precursors of social capital indices, including socio-economic status, supportive family relationships, parental involvement, parent punishment style, and marital discord.

Several longitudinal studies have explored the impact that family context factors have on child development. Pulkkinen, Nygren, and Kokko (2002) explored the longitudinal impact that growing up in a family with low socio-economic status, having less supportive parent-child relationships, increased use of physical punishment of the child, and less supervision had on adulthood socialization. Results demonstrated that experiencing these family context factors in childhood and adolescence was related to lower levels of social ability (an index of social capital) in adult women and men (Pulkkinen et al., 2002). Additionally, the frequency and duration of marital disharmony in both overt and covert expressions (e.g., fighting and day-to-day tensions) has been found to impact several of the variables that Pulkkinen et al. (2002) studied longitudinally in relation to socialization. Another longitudinal study conducted by Cummings, George, McCoy, and Davies (2012) supported these results. Children who experienced marital disharmony in the home in kindergarten were more likely to experience internalizing (e.g., withdraw, anxiety) and externalizing symptoms (e.g., aggression, rule breaking) in later childhood. This experience was mediated by the development of emotional insecurity in middle childhood. Each of these outcomes has the potential to negatively impact a child’s ability to build social relationships with peers and adults.

Furthermore, marital disharmony has been found to impact the parent-child relationship by increasing levels of child neglect and parents’ physical aggression toward the child (Jenkins & Smith, 1991). Meta-analysis has also demonstrated that parental conflict and related family
context are important factors in child development of internalizing and externalizing symptoms, especially when domestic violence or aggression is involved (Wolfe, Crooks, Lee, McIntyre-Smith, & Jaffe, 2003). Although having greater social ability to create relationships does not adequately capture the entire construct of social capital in adulthood, it becomes apparent that family contextual variables have significant impact not only on the child’s immediate experience, but also his or her social outcomes as an adult. Without the ability to establish high quality social connections, the potential for resources an adult has by virtue of their social network (i.e., social capital) may be diminished.

Variables such as household income, education, and occupation status relate to differential experience of families and children and have been demonstrated to be transmissible across generations (Carvalho, 2012): children born into families with higher socio-economic status (SES) tend to have higher SES indices themselves as adults. Theoretically, these variables may have an impact on social capital in that a lack of financial resources can contribute to a lack of potential resources for a family to access through social networks, a generally accepted source of social capital. Boisjoly, Duncan, and Hofferth (1995) explored SES factors, particularly of income, education, and neighborhood poverty, as factors related to families’ levels of social capital. The sample was made up of 3,311 U.S. families from the longitudinal Panel Study of Income Dynamics (PSID). Results from this study generally suggest that income and level of education may be positively correlated with access to both friend and family networks; however, the direction of effect is unclear and factors such as race/ethnicity of the family may serve as moderators for this relationship. Nevertheless, socio-economic factors remain a potential index of social capital in adulthood and an important precursor to explore in childhood, particularly given the potential for intergenerational transmission.
Outside of family connections, peer relationships in childhood are additionally important precursors to social capital as the number and quality of peer relationships is an index of a child or adolescent’s social capital (Chin & Phillips, 2004; Leonard, 2005). The longitudinal research reported by Englund et al. (2011) found that a higher level of childhood interpersonal functioning (measured by teacher rankings of competence with peers) was related to better social relationships at age 26. Additionally, a longitudinal study by Gest, Sesma, Masten, and Tellegen (2006) measured the consistency of peer relationships in childhood (3rd through 6th grade) to peer relationships in late adolescence/adulthood ten years later (17-24 years old). Peer relationships were measured in children by both peer nominations for roles in a play that were either positive or negative, and interview-derived survey measures of the child’s peer acceptance and close friendships. In adulthood, positive peer relationships were conceptualized by the extent of a person’s friendship network, including frequency of socialization with same-sex peers, and the number of close relationships where the individual felt comfortable sharing personal thoughts and concerns. General results suggest that individuals who experienced better peer relationships as children continued to experience positive peer relationships in adulthood. Specifically, children who were categorized as “popular leaders” experienced a significant increase in social and romantic competence with others ten years later (Gest et al., 2006).

Research has also suggested that aggressive behaviors in children are related to higher levels of peer rejection and fewer friends, which would impact the amount of social capital readily available to them. Dodge et al. (2003) demonstrated this connection through several studies with a diverse sample of 259 children over the course of 5 years. One set of findings in particular demonstrated that teacher-rated aggression and peer rejection were related both cross-sectionally and longitudinally. Another longitudinal study completed by Ladd and Burgess
CHILDHOOD PRECURSORS OF ADULT SOCIAL CAPITAL INDICES

(1999) examined 399 kindergarten students from across the US and followed up with them at 4
time periods spanning until second grade. During each wave, teachers reported on each of their
student’s physical and verbal aggression with peers and children were interviewed to obtain
sociometric data, including peer friendship nominations, how much children in the classroom
liked to spend time with or felt victimized by each of their classmates, and their own feelings of
loneliness, sadness, and rejection at school. Results demonstrated that aggressive children
experienced significantly less peer acceptance, reported feeling more lonely, and were less likely
to have mutual friendships at all time points than a normative sample of their peers (Ladd &
Burgess, 1999).

Community Level Precursors

Community-level variables in childhood may be precursors to the accumulation of
adulthood social capital if they reflect connections with the wider community that the family
affords to the child (e.g., connections to adult neighbors, youth groups, religious organizations).
Putnam (1995) postulated that religious organizations in particular are one of the most prevalent
and important community connections for accumulating of social capital. Theoretically, religious
ties are important due to the supportive nature of congregations, tendency for members to
participate in community service and civic engagement project, and the tangible benefits offered
by nature of religious relationships.

In a longitudinal study with over 20,000 kindergarteners from the United States,
frequency of church attendance by parents was positively correlated with the development of
children’s interpersonal skills in the following 2 years. These social abilities were rated by both
parents and teachers, and focused on children’s ability to form and maintain friendships as well
as their ability to comfort, understand, join in with, and express feelings to peers (Bartkowski,
Xu, & Levin, 2008). In another sample of 445 children aged 11-13, having a mother who attended religious services was correlated with youth reports of feeling more socially supported by friends during clinical interview (Varon & Riley, 1999).

Few studies have been conducted on how family religiosity in childhood or adolescence contributes to social capital accumulation into adulthood. However, there is some evidence that more religious children will continue to be religious adults (McCullough, Enders, Brion, & Jain, 2005) meaning that this type of social capital may still be available in adulthood. For example, a study completed by McCullough, Enders, Brion, and Jain (2005) utilized growth mixture models to explore religious development in a 50-year longitudinal study. Although this study primarily utilized a sample of gifted children born in the early 1900s, the results suggest that over the life course, those who reported having stronger religious upbringings as children and adolescents tended to either increase in religiosity as they grew older or at least stay at the same level. Those with lower religious upbringings tended to continue on this trajectory and become less religious with age. When examining these results together, it becomes apparent that childhood social capital conferred through family religious experiences may continue to be maintained through adulthood, and therefore, these experiences are important to study as precursors to adult level social capital.

**Gender Differences**

Research has demonstrated that children are socialized differentially based on gender through a variety of sources and through all stages of development (e.g., Lytton & Romney, 1991; McHale, Crouter, & Whiteman, 2003). There are several variables identified as both precursors and indices to social capital that may be experienced differently by the genders.
Research thus far has primarily explored gender differences of social capital in the workplace. It appears that women tend to have a different set of network connections than men (e.g., women have more family member connections while men have more outside family connections) and these differences can be reduced when women worked outside the home (Moore, 1990). This suggests that these differences are related to traditional gender roles. Even within the same workplace or position, women generally accumulate different types of social capital. For instance, one study of university faculty members found that men accumulated more social capital resources related to job performance and advancement than women, but that men and women were equally able to accumulate social capital resources related to interpersonal socio-emotional support (van Emmerik, 2006). These differences may be accounted for by women being seen as less “legitimate” members of the organization (a perspective influence by perception of gender roles and responsibility), which means they do not have access to the same types of social capital as men (Burt 1998).

In terms of potential precursors to social capital, many of the proposed constructs have been demonstrated to have gender differences. For instance, meta-analysis supports that there are typically small differences between genders in terms of pro-social moral behaviors, wherein women are more “care” oriented and men are more “justice” oriented in their behavior toward others (Jaffee & Hyde, 2000). In a recent study, Eisenberg (2014) found that women were more likely to demonstrate sympathy, consideration for others, and perspective taking for others, but not to be more “care oriented” than men, suggesting that findings are mixed or differences are small to moderate in size. Research also suggests that parents play an important role in socializing girls and boys differently (Lytton & Romney, 1991; McHale, Crouter, & Whiteman, 2003). Families also tend to treat their sons and daughters differently in key ways; for instance,
some research shows that boys are more harshly punished than girls (McKee et al., 2007). There also appear to be gender differences in both amount and type of aggression, where females are less aggressive than males in general and engage in less direct forms of aggression across the life span (Archer, 2004). Furthermore, although there are no highly supported cognitive differences between males and females in terms of intelligence, girls generally out-perform boys in academic achievement, with the exception of mathematics (Nowell & Hedges, 1998). Cumulatively, these various research findings suggest that there are gender differences in many of the identified potential precursors to social capital.

The Present Study

While there are a number of definitions of social capital, the general consensus amongst researchers is that social capital is the potential for resources accumulated via relationships with other people. Additionally, it is acknowledged that a multidimensional assessment that accounts for indices of social capital from the personal, interpersonal, socio-economic, and community level is important for capturing the construct.

Social capital has been found to correlate with a variety of individual factors, including better general psychological well being, higher earnings, fewer depressive symptoms, and better physical health both generally and in terms of lowered mortality (Basett & Moore, 2013; Gilbert et al., 2013; Growiec & Growiec, 2010; Kawachi, Kennedy, & Glass, 1999; Mohnen et al., 2011). Longitudinally, adolescents with higher social capital experienced fewer behavior problems, lower levels of aggression and violence, and more positive general well-being and psychosocial development in adulthood than those with low levels of social capital (Englund et al., 2011; Pettit et al., 2011; Runyan, et al., 1998; Wright & Fitzpatrick, 2006).
Fewer studies have been conducted, however, to determine which factors from childhood and adolescence contribute to higher levels of social capital in adulthood. Of those that have, there is support for the idea that precursors of social capital can be conceptualized as comprising of three ecological categories: individual-personal, interpersonal, and community level. Individual-personal precursors include development of childhood moral emotions, and intellectual achievement. Interpersonal precursors include quality of relationships, and connections child-rearing context and family socio-economic status factors. Community-level precursors, among others, include religious involvement (Conger, Conger, & Martin, 2010; Cummings & Davies, 2002; Englund et al., 2011; Leonard, 2005; Mcloyd, 1998; Pulkkinen et al, 2002; Putnam, 1995; Waters et al., 2000).

In this master’s thesis, I will utilize archival data from The Columbia County Longitudinal Study (CCLS; Eron, Walder, & Lefkowitz, 1971; Lefkowitz, Eron, Walder, & Huesmann, 1977; Huesmann, Eron, Lefkowitz, & Walder, 1984; Huesmann, Eron, & Dubow, 2002) to explore childhood factors that predict adult indices of social capital. The CCLS includes interviews and assessments of a sample of participants (the entire third grade population in Columbia County, NY, in 1960) initially interviewed at age 8, and then subsequently at ages 19, 30, and 48. For the purposes of my thesis, I will use data from ages 8 and 48 to examine the childhood precursors of adult social capital.

First, I will create a multidimensional index of social capital in adulthood that is based on a nested ecological model. This will include indices of social capital based on measures about the participants at age 48. Next, I will examine the degree to which childhood variables collected at ages 8 in the individual-personal, interpersonal, and community domains predict adult levels of social capital.
Specific Hypotheses

1. Analyses will support a multidimensional measure of social capital for adults with indices from four domains: individual (prosocial behavior, perceived social competence), interpersonal (spousal aggression, marital satisfaction, and perceived social support), socio-economic (education level and occupational status), and community (religious affiliation and neighborhood efficacy).

2. Factors in childhood (mean age = 8) will be significantly related to levels of social capital in adulthood and these connections will be strongest between theoretically related domains (e.g., individual precursors will be most strongly related to individual indices).

   a. Individual Level Precursors
      i. I expect that childhood intellectual achievement/ educational aspirations, and childhood moral emotion development (e.g., feeling guilt about and confessing to wrong doing) will be precursors to adult social capital.

   b. Interpersonal Level Precursors
      i. I expect that indices of positive peer relations (i.e. popularity and a lack of aggression), a positive child-rearing context (i.e., lack of parental rejection, parental nurturance toward the child, lack of harsh punishment, and lower levels of parental disharmony), higher levels of family socioeconomic resources (e.g., higher parental education and occupational status) will be precursors to more positive adult social capital.
c. Community Level Precursors

   i. I predict that family religiosity (church attendance) at age 8 will be a precursor to higher levels of adult social capital.
METHOD

Participants

Background of the Columbia County Longitudinal Study (CCLS)

The Columbia County Longitudinal Study (CCLS; e.g., Dubow, Boxer, & Huesmann, 2009; Eron, Walder, & Lefkowitz, 1971; Lefkowitz, Eron, Walder, & Huesmann, 1977; Huesmann, Dubow, & Boxer, 2009; Huesmann, Eron, & Dubow, 2002; Huesmann, Eron, Lefkowitz, &, Walder, 1984) is a long-term longitudinal study that began in 1960 by recruiting 856 third grade students in Columbia County, New York; 85% of the children’s mothers and 71% of their fathers were also interviewed at in 1960. Parents were labeled Generation 1 (G1) and the 8-year-old participants as Generation 2 (G2). The original sample (G2) was assessed three subsequent times: in 1970 (age=19, n=427, equally male and female), in 1981 (age=30, n=409, 119 male, 211 female), and in 2000 (age=48, n=523, 268 male, 255 female). In 2000, spouses and other close informants of the participants (n=394) were also assessed to gain additional information about the participants. The CCLS was designed with the intent to explore the origin and course of aggressive behavior. However, researchers at each time point collected a variety of other variables, including measures of cognitive abilities, relationships with parents, peers, and spouses, and information about mental health, personal traits, and beliefs and attitudes regarding social relationships.

Because I am examining childhood precursors of adulthood social capital, I will focus on data collected on the original participants when they were children (age 8) and adults (age 48). Of the original 856 participants, 523 (61%) were re-interviewed at age 48.
Demographic Characteristics of the CCLS Participants

In 1960, all of the third-graders (n=856) from 38 public and private school classrooms in Columbia County, NY, participated in the study. The region is a semi-rural county in the state of New York with a population of approximately 63,000 residents, 7,500 of whom reside in Hudson, the largest city in the county. Gender distribution was equivalent with 51% male students and 49% female. A majority of the sample identified as Caucasian (90%). The sample had very few ethnic minorities (i.e. 3% African American, <1% Asian or Pacific Islanders, <1% Hispanic), which has prevented the use of separate analyses by race or ethnicity. The participants came from a diverse background of socio-economic statuses (mean SES=4.3, “Middle Class,” as reported by Eron et al., 1971 using an SES rating derived from Warner et al.’s 1960, jobs scale based on father’s occupation). At age 8, their average IQ was 104 (SD = 14). At Wave 4, as noted, 523 of the original G2 sample was re-assessed via interview over the years of 1999-2002. At that time, the average level of education that had been obtained by participants was between “some college and a college degree”; average occupational attainment reflected middle-class status (calculated by the average occupational prestige code using Stevens & Hoisington’s [1987]); and 69% were living with their spouses. Additionally at Wave 4, the average verbal achievement score on the Wide Range Achievement Test (WRAT) was 99.15 (SD=13.72).

Procedures

In Wave 1, at age 8, children were administered classroom-based and individual interviews, while their parents (G1) were interviewed individually. At Wave 4 (mean age = 48), 2-4 hour long interviews were conducted with participants and their spouses or other close informants by computer in a field office and by mail/ telephone for those who could not attend a data collection session in-person.
Measures

In the following Measures section, I will describe the measures at Wave 4 (mean age 48) that will be combined to create a multi-dimensional measure of adult social capital. Next, I will describe the various assessments at Wave 1 (average age =8) that are hypothesized to be precursors to adulthood social capital. A complete list of Wave 1 measures by rater can be found in Table 1.

Indices of Social Capital in Adulthood at Age 48

Individual-Personal Level Indices

Prosocial behavior. Participants were asked to indicate the frequency with which they engaged in 20 specific prosocial behaviors within the past year (Rushton, Fulker, Neale, Nias, & Eysenck, 1989). Prosocial acts described included helping or offering to help others directly or indirectly (e.g., “I have helped push a stranger’s car out of the snow,” “I have donated blood”) and giving to charity (e.g., “I have given money, goods, or clothes to a charity”). Responses were rated on a 5-point scale of 0= “never,” 1= “once,” 2= “more than once,” 3= “often,” and 4= “very often.” Scaled scores were computed by taking the mean of all items, where higher scores indicated more frequent engagement in prosocial behavior. Coefficient alpha was .90.

Perceived competence. Participants completed a version of the Harter Self-Perception Profiles (Harter, 1985) questionnaire. For purposes of this thesis, items were selected based on relatedness to the construct of social capital. Each item is presented as a pair of opposing descriptions for a variety of specific behaviors, beliefs, and feelings. Participants were directed to select which description applied best to themselves, and then indicate whether the description was “sort of true” or “really true” for them, for a total of 4 potential response options. These responses were rated on a 4-point scale ranging from 1 to 4, with higher scores indicating higher
levels of perceived competence (1= “not very true,” 2= “sort of true,” 3= “pretty true,” to 4= “really true”). The four domains of perceived competence assessed for purposes of this master’s thesis project include social (2 items; e.g., “Some adults feel they are enjoyable to be with, BUT other adults often question whether they are enjoyable to be with”; coefficient alpha = .52), family-provider (2 items; e.g., “Some adults are satisfied with how they provide for the important people in their lives, BUT other adults are dissatisfied with how they provide for those people”; α = .70), intimate relationships (2 items; e.g., “Some adults find it hard to establish intimate relationships, BUT other adults don’t have trouble establishing intimate relationships”; α = .68) and nurturance (1 item; “Some adults feel they are good at nurturing others, BUT other adults are not very nurturant”).

**Interpersonal Level Indices**

**Spousal aggression.** Nine items from the Home Violence Questionnaire (Straus, Giles, & Steinmetz, 1980) were administered to participants who were currently married or had recently lived with a partner or spouse. Participants indicated the frequency with which they directed threatening (e.g., with a knife or gun) or physically aggressive (e.g., pushed or shoved, beat up) acts towards their partner in the last 12 months. Responses were scored on a 10-point scale ranging from zero to “9 or more.” Alpha was .72 for self-reports.

**Marital satisfaction.** Participants indicated their satisfaction with their current or former marriages or intimate relationships on the Kansas Marital Satisfaction Scale (Schumm et al., 1986). This scale measures relationship satisfaction with three global items where respondents rate how satisfied they are with their marriage, with their husband or wife as a spouse, and with their relationship with their husband or wife (e.g., “How satisfied are/were you with your marriage?”). Unmarried respondents were asked to answer each question about their romantic
partners. If separated or divorced, respondents were asked to rate their relationship with the most recent spouse or live-in romantic partner. Ratings were made on a 7-point scale ranging from 1= “extremely dissatisfied” to 7= “extremely satisfied.” Scores were computed by taking the mean of the three items. Coefficient alpha was .96.

**Social support.** Participants completed a 6-item version of an instrument assessing perceived support from family and peers (Dubow & Ullman, 1989). For this measure, participants read brief (one sentence) statements describing potential manifestations of social support and were then asked to indicate how strongly they believed the descriptor applied to their own experiences. Three items measure perceived support from family members (e.g., “Some people think their families really care about them, but other people think their families don’t. Do you think your family cares about you?”) and 3 items from friends (e.g., “Some people feel left out by their friends, but other people don’t. Do you feel left out by your friends?”). Responses were provided on a 5-point scale, ranging from 1= “always,” 2= “most of the time,” 3= “sometimes,” 4= “hardly ever,” and 5= “never.” Scale scores were calculated for the full measure (α = .78), family support (α = .91), peer support (α = .63.)

**Socio-Economic Level Indices**

**Educational level.** Participants reported their educational attainment along a 7-point scale (0 = did not finish high school, 1 = some high school, 2 = HS graduate, 3 = some college or tech school, 4 = bachelors or RN degree, 5 = some graduate school, 6 = master’s degree, 7 = doctorate or law degree).

**Occupational status.** Occupational prestige was rated for participants using prestige codes described by Stevens and Hoisington (1987). Prestige codes are provided for 889 specific occupations within 13 occupational categories (e.g., executive, administrative, and managerial;
professional specialty; technicians; sales; protective service; mechanics/repairers; machine operators and inspectors). Higher codes indicate greater prestige. The codes range from 153 (ushers) to 810 (physicians). Two raters coded the participants’ occupations. On a subsample of 162 occupations coded by each rater, the correlation between their assigned codes was $r = .81$.

**Community Level Indices**

**Neighborhood efficacy.** This is a 10-item measure made up of two subscales on a measure developed by Sampson, Raudenbusch, and Earls (1997) (1.) *Informal social control* was measured by asking participants to rate the likelihood that their neighbors “could be counted on to intervene” in five different problem situations (e.g., “if children were spraying graffiti on a local building?” “if a fight broke out in front of their house?”). Ratings were made on a 5-point scale ranging from 1= “very unlikely” to 5= “very likely.” (2.) *Social cohesion and trust* was measured by asking participants to indicate their agreement with five statements about their neighbors (e.g., “people in this neighborhood can be trusted” “people around here are willing to help out their neighbors”). Ratings were made on a 5-point scale ranging from 1= “strongly disagree” to 5= “strongly agree.” Scores for each subscale were computed by taking the mean of the five items on each scale. Coefficient alphas were .89 (total), .85 (informal social control), and .85 (social cohesion and trust).

**Religiosity.** Participants indicated their frequency of religious service attendance (“How often do you attend religious services?”, rated as 1= “never,” 2= “less than once/year,” 3= “1-2 times/year,” 4= “several times a year,” 5= “about once a month,” 6= “2-3 times a month,” 7= “nearly every week,” 8= “every week,” and 9= “several times/week”) (Eron, Walder, & Lefkowitz, 1971).

Precursors to Adult Social Capital: Childhood Precursors at Age 8

**Individual Level Precursors**

**Expression of guilt/confession.** The expression of guilt scale was used to assess the extent to which the child feels guilty about his/her bad behaviors, as reported by his/her parents. It consisted of seven ‘yes (2)–no (1)’ questions with scores ranging from 7 to 14, where higher scores indicate more guilt experienced (Eron, et al., 1971). A child low on guilt would be one who “feels that his punishments are not justified, doesn’t worry about lies, and does not feel sorry when he/she disobeys.” Ratings from both parents were combined when available. Coefficient alpha for expression of guilt scale was 0.65. The confessing scale assessed through parent ratings the extent to which the child was willing to admit transgressions. It consisted of two items with five-point response scales, so scores could range from 2 to 10. A child low on confessing would be one who, according to his/her parents, “always denies doing ‘naughty’ acts”, and who “never tells them about naughty acts without them having to ask.” Ratings from both parents were combined when available (α = 0.56.) (Eron et al., 1971)

**Intellectual achievement.** The California Short-Form Test of Mental Maturity (Sullivan, Clark, & Tiegs, 1957) was used to estimate IQ at age 8. Kuder-Richardson reliability coefficients range from .87-.89 and the total score provided by this test correlates approximately .75 with other IQ measures.

**Interpersonal Level Precursors**

**Aggression.** A peer-nomination procedure developed by Eron et al. (1971) was used to compute a score of aggressive behavior. Each child was asked ten questions about who in their class engages in aggressive behavior. There were 4 types of aggression assessed: physical (e.g., “Who pushes and shoves other children?”), verbal (e.g., “Who says mean things?”),
acquisitive (e.g., “Who takes other children’s things without asking?”), and indirect (e.g., “Who makes up stories and lies to get other children into trouble?”). Each child in the class was assigned a score representing the proportion of times he or she was nominated by classmates of either gender on the ten items (total number of nominations received across the ten items/number of classmates times ten). This measure is described in further detail in several articles (Eron et al., 1971; Huesmann et al., 1984), and has been widely used. In cross-national samples, including the Columbia County Longitudinal Study (CCLS), it has an alpha of .90 (Huesmann et al., 1984; Huesmann & Eron, 1986).

**Popularity.** This peer-nominated score represents the proportion of times the participant was nominated by classmates on two interview items: "Who would you like to have as a best friend?" and “Who would you like to sit next to in class?” Scores were computed similarly to the peer-nomination of aggression score (total number of nominations received across the two items/number of classmates times two). Cronbach’s alpha was .87 and the popularity scores were found to correlate negatively with aggression (Eron et al., 1971).

**Child rearing context.** This measure is a composite of three subscales measured at age 8 through parent report (Eron et al., 1971). (1.) **Parental rejection** is the sum of scores on 10 items about how dissatisfied the parent is with the child, e.g., "Are you satisfied with your child's manners?" “Does your child read as well as he/she should?” (yes/no) (α = .75). (2) **Parents’ punishment** is measured by asking parents whether he or she would use each of several specific forms of punishment in response to vignettes depicting child transgressions, (e.g., "If you saw [your son] grab things from another child, would you…”) Two physical punishments were included: “spank your child until he/she cries?” and “slap your child in the face?” (yes/no); (3.) **Parental disharmony** measures the amount and seriousness of disputes between the parents. It is
the sum of 10 items, including "Do you or your spouse ever leave the house during an argument?" and “Do arguments between you and your spouse ever settle anything?” (yes/no) (α = .77). The composite score was derived through latent variable measurement modeling. Individual scores were standardized, multiplied by factor weights observed in the measurement model and then summed to create the child-rearing context composite.

**Family socio-economic status.** Family SES was a composite of three separate measures from Eron et al. (1971). (1) *Father’s occupational level* was measured using an occupational coding scale adapted by Eron et al. (1971). Occupations were coded on a 10-point scale (0 = laborers to 9 = professionals); (2) *Parents’ educational level* reflects the parents’ levels of educational attainment on 7 point scale: 1 = under 7 years, to 7 = graduate/professional training; (3) *value of family housing* was obtained by ranking the family home on a 4 point scale: 1 = inexpensive rental, 2 = expensive rental, 3 = inexpensive owned, 4 = expensive owned. The composite score was derived through latent variable measurement modeling. Individual scores were standardized, multiplied by factor weights observed in the measurement model and summed to create the family background composite.

**Community Level Precursors**

**Religiosity.** This score was a single item parent report variable of parents’ church attendance. The scale ranged from (0=never to 4 = once or more a week).
Table 1
Selected Measures for Child Precursors to Adult Social Capital

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<thead>
<tr>
<th>Measures</th>
<th>Source of Information About Participant</th>
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<tr>
<td></td>
<td>Self</td>
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<tr>
<td>I. Individual-Personal Level</td>
<td></td>
</tr>
<tr>
<td>Intellectual Ability (Sullivan, Clark, &amp; Tiegs, 1957)</td>
<td>X</td>
</tr>
<tr>
<td>Guilt/confession (Eron, 1971)</td>
<td></td>
</tr>
<tr>
<td>II. Interpersonal Level</td>
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<tr>
<td>Popularity/sociability (Eron et al., 1971)</td>
<td>X</td>
</tr>
<tr>
<td>Aggression (Eron et al., 1971)</td>
<td>X</td>
</tr>
<tr>
<td>Child-rearing context (Eron, 1971)</td>
<td></td>
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<tr>
<td>Family socio-economic status (Eron et al., 1971)</td>
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<tr>
<td>III. Community Level</td>
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<td>Religiosity</td>
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</table>
RESULTS

Preliminary Analyses

First, I computed independent sample t-tests to determine if there were significant differences in the measured variables between males and females. Means and inter-correlations among the adult social capital indices measured at wave 4 are presented in Table 2 (means by gender) and Table 3 (correlations by gender), respectively. Table 2 demonstrates that there are significant differences between males and females in terms of the following indices: social competence (social skills, interpersonal relationships, and nurturance), perceived social support from peers, marital satisfaction, and religiosity. The means, standard deviations and inter-correlations among the childhood precursor variables measured at wave 1 are presented in Table 5 (means) and Table 6 (correlations), respectively. Table 5 demonstrates that there are significant gender differences for the following childhood precursors: expression of guilt and confession, aggressive behavior, and family context variables.

The results of these t-tests suggest that there are significant differences between males and females in terms of several measured variables. This suggests that a multi-group model split by gender might be appropriate when conducting confirmatory factor analysis for both the proposed measurement model (Hypothesis 1) and the proposed structural model of precursors predicting adult social capital (Hypothesis 2).

Hypothesis One: A four-factor measure of adult social capital will be supported

I hypothesized that adulthood social capital indices would reasonably conform to four domains: individual (prosocial behavior, perceived social competence), socio-economic status (education level and occupational status), interpersonal (spousal aggression, marital satisfaction,
and perceived social support), and community (religious affiliation, and neighborhood efficacy). This model is represented in Figure 2.

Second order confirmatory factor analysis was used to test the proposed measurement model using AMOS statistical software (Version 18.0). Each of the four latent domains (Individual, Socio-Economic, Interpersonal, and Community) was hypothesized to contain the specified manifest variables. Several indices were utilized to determine Goodness of Model fit: Chi-Square divided by degrees of freedom ($CMIN/DF$; good fit = less than 3), Comparative Fit Index ($CFI$; good fit = >.93), and the Root Mean Square Error of Approximation ($RMSEA$; good fit = <.05). RMSEA in particular was chosen as a primary fit index due to the large sample size and complexity of the proposed model (Byrne, 2010, p. 73-84).

The initial second order confirmatory factor analysis was a single-group measurement model of social capital that included all of the participants. Results from this CFA suggest fair model fit ($CMIN/DF = 2.363$, $CFI = .890$, $RMSEA = .040$).

The following second order confirmatory factor analysis was a multi-group model by gender. This type of model allows for comparison between a “constrained” model where measurement weights are assumed equal for both genders, and an “unconstrained model” that allows the measurement weights to freely vary for males and females. Fit indices for the unconstrained, multiple-group model by gender were: $CMIN/DF = 1.77$, $CFI = .875$, $RMSEA = .030$. The constrained model fit indices demonstrated similar fit: $CMIN/DF = 1.75$, $CFI = .869$, $RMSEA = .030$. Chi Square difference testing indicated that there was no significant difference between the unconstrained and the constrained model fit indices ($\Delta \chi^2 = 14.812$, $DF = 10$, $p = .139$), suggesting that the indices of social capital in adulthood fit the hypothesized model similarly for both genders.
Analysis of the standardized estimates for Religiosity ($\beta = .037$ for males and .078 for females) and Prosocial Behavior ($\beta = .226$ for males and .137 for females) found that these values were lower than those for other variables loading on the same domain. I removed these two variables from the model and re-computed the model fit. Both the constrained ($CMIN/DF = 1.58$, $CFI = .926$, $RMSEA = .026$) and the unconstrained model ($CMIN/DF = 1.56$, $CFI = .932$, $RMSEA = .026$) were found to be a good fit for the data. Chi-Square difference testing found that the less parsimonious unconstrained model was not a significant improvement over the constrained model ($\Delta \chi^2 = 13.062$, $DF = 8$, $p = .110$). Therefore, the more parsimonious constrained model was selected as the measurement model of social capital, pictured in Figure 3.

Furthermore, measurement model estimates indicated that the four latent domains of social capital were generally inter-correlated, although some connections appear stronger than others. These inter-correlations are presented in Table 4.

**Hypothesis Two: Factors in childhood will be significantly related to levels of social capital in adulthood**

I hypothesized that factors in childhood would be related to adult social capital indices in adulthood, particularly across similar theoretical domains (e.g., individual factors in childhood would predict individual level adulthood social capital indices more strongly than indices in other domains). Figure 4 shows the specific variables from childhood in these domains that I hypothesized to predict adulthood levels of social capital.

I first computed a second order confirmatory factor analyses to determine if the childhood variables conformed to a latent measurement model, as did the adult social capital indices. Fit indices for the proposed model indicated a poor fit ($CMIN/DF = 15.363$, $CFI = .687$, $RMSEA = .130$) which improved slightly with multiple group (gender) analysis (unconstrained:
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CMIN/DF = 8.211, CFI = .690 RMSEA = .092; and constrained: CMIN/DF = 7.215, CFI = .688, RMSEA = .085). Because the childhood indices do not appear to conform to a latent measurement model regardless of gender grouping or constrained measurement weights, I decided to examine Hypothesis 2 using the manifest childhood variables as predictors of the latent measures of adult social capital.

Confirmatory factor analysis was then conducted for the predictive model of childhood variables as precursors to adult social capital. For each theoretical domain of childhood predictors (i.e., individual, interpersonal, and community), I computed a multiple group (gender) model predicting the adult latent domains of social capital; this allows for a comparison of two models: a “constrained model” where structural weights are assumed equal for males and females and an “unconstrained model” where the structural weights are allowed to vary between males and females.

Significant \( p < .05 \) connections between childhood precursors and adult social capital indices are discussed below. Both significant and marginally significant \( p < .10 \) results for each of the three childhood domains – Individual, Interpersonal, and Community -- are depicted in Figures 5, 6, and 7, respectively.

**Individual Level Childhood Variables.**

For the individual level childhood variables, the unconstrained model \((CMIN/DF= 1.289, CFI= .967, RMSEA= .018)\) was superior to the constrained model \((CMIN/DF= 1.621, CFI= .913, RMSEA = .027)\). Chi-Square difference testing supported that this was a significant difference \(\Delta \chi^2 = 99.596, \text{df} = 174.711, p = < .001\), showing that there are gender differences in individual-level childhood precursors of adulthood social capital. This multiple group (gender) structural model is pictured in Figure 5. Both for males and for females, there were two individual level
childhood variables that were significant positive precursors to adult social capital at the socio-economic level: confession to wrongdoing and cognitive ability (IQ). For males only, cognitive ability was also a significant positive precursor of community and interpersonal level indices of social capital in adulthood, and guilt was a significant positive precursor to interpersonal social capital.

**Interpersonal Level Childhood Variables.**

For the interpersonal childhood variables as predictors of adult social latent domains, the unconstrained model ($CMIN/DF= 1.320, CFI=.955, RMSEA=.019$) was superior to the constrained model ($CMIN/DF=1.720, CFI=.875, RMSEA=.029$), a finding supported by chi-square difference testing ($\Delta X^2 = 115.979, df = 36, p=<.001$). The results from the unconstrained multiple group (gender) structural model is pictured in Figure 6. Both for males and for females, there were two interpersonal level childhood variables that were significant precursors of adult socio-economic social capital: lower levels of aggression and higher levels of family socio-economic status. For males, childhood aggression was also a significant negative precursor to interpersonal and community level social capital in adulthood. Higher popularity and better-adjusted child-rearing context both were significantly related to adult socio-economic social capital for males. For females, better-adjusted child-rearing context was a significant predictor of individual level social capital. Family socio-economic status also related to later community social capital for females.

**Community Level Childhood Variables.**

For the community childhood variables, the unconstrained model ($CMIN/DF= 1.580, CFI=.924, RMSEA=.026$) appeared superior to the constrained model ($CMIN/DF=1.949, CFI=.849, RMSEA =.033$). Chi-Square difference testing supported that the unconstrained model
is a significantly better fit than the constrained solution ($\Delta \chi^2 = 88.13$, df = 24, $p = <.001$). The results are shown in Figure 7. Higher levels of family religiosity in childhood were significantly related to socio-economic indices of social capital for both males and females. Additionally for females, increased rate of church attendance of their mother in childhood was related to higher levels of individual and interpersonal social capital indices in adulthood.

**Summary of Results**

The measurement model of social capital was generally supported by confirmatory factor analysis. There were two variables with weaker estimates than others: religiosity and prosocial behavior. When these two variables were removed from the model, fit indices improved significantly. In terms of the second hypothesis, there were multiple childhood precursors to adult social capital domains, the presence and strength of which vary by gender. These results are displayed in Table 7 and summarized below.

Individual childhood precursors were significantly related to the adult social capital domains of socio-economic, interpersonal, and community; however some of the specific connections were different for men and women. For both genders, cognitive ability and confessing to wrong-doing were related to higher levels of socio-economic social capital (indexed by occupation and education level.) For males, increased cognitive ability was a prominent precursor, in that it was related to increases in two other domains of social capital in addition to socio-economic status: interpersonal and community. Also, for men alone, feeling guilty as a child predicted higher levels of interpersonal social capital. For women, cognitive ability was also a significant positive precursor to the socio-economic domain in adulthood.

The relationships between interpersonal childhood precursors and adult social capital domains also differed by males and females, with only one similarity. For both men and women, aggression was a negative precursor to socio-economic social capital. For men, aggression was a
prominent negative precursor in that it also was related to two other domains of social capital: interpersonal and community. Additionally for men alone, interpersonal variables of popularity, better-adjusted child-rearing context, and family socio-economic status as a child were related to their future socio-economic indices of social capital. When considering precursors for women alone, better-adjusted child-rearing context was a precursor to individual domain of social capital while higher levels of family socio-economic status in childhood was related to later levels of community social capital.

When it comes to community precursors of social capital, there was one similarity for males and females. Higher levels of maternal religiosity (i.e., attending religious services more frequently) during childhood were related to higher levels of socio-economic status in adulthood. For women, maternal religiosity was also related to the individual and interpersonal domains of social capital in adulthood.

There are a few general trends that are important to note when considering childhood precursors of adult social capital domains. For men, all of the childhood variables, with the exception of feeling guilty for wrong-doing in childhood, were precursors to future socio-economic social capital. For women, there were fewer significant connections. Also of note is that there were no childhood variables that were precursors to the individual domain of social capital for men. Additionally for men, both aggression and cognitive ability were prominent precursors, in that they were significant precursors to three out of the four social capital domains. For women, maternal religiosity in childhood was the one prominent precursor for three out of four adult social capital domains.
DISCUSSION

Social capital has been defined and measured in various ways through the literature, at times with some debate (Adler & Kwon, 2002; Fulkerson & Thompson, 2008; Onyx & Bullen, 2000; Portes, 2000). For purposes of this project, the most common definition was used: social capital is the potential for resources (both tangible and support oriented) that an individual accumulates simply by nature of their social relationships. Having larger amounts of social capital has been correlated with several positive experiences. These include higher subjective well-being and earnings, (Growiec & Growiec, 2010), improved health and lower mortality (Gilbert et al., 2013; Kawachi, Kennedy, & Glass, 1999; Mohnen et al., 2011), and fewer depressive symptoms (Basset & Moore, 2013). Additionally, family social capital appears to bestow benefits upon children and is associated with fewer behavior problems and developmental deficits (Pettit et al., 2011; Runyan et al., 1998), lower levels of interpersonal violence (Wright & Fitzpatrick, 2006), and better psychological, social, and occupational functioning (Englund et al., 2011). Despite evidence that having social capital may benefit people in a variety of ways, less is known about how it is accumulated over the life course or which early life variables might be precursors to its accumulation. The purpose of this master’s thesis has been to contribute to this body of literature in two ways: 1) by considering an ecologically informed and comprehensive measurement model for adulthood social capital and 2) by exploring factors in childhood that precede higher levels of social capital in adulthood.

The Current Study

The first hypothesis was that an ecologically informed measurement model -- with both developmental and contextual levels -- would best account for the global construct of social capital. These included: Individual, Socio-Economic, Interpersonal, and Community level indices.
The second hypothesis involved using longitudinal data to identify precursors to social capital accumulated in adulthood. Childhood variables were theorized to fit the same theoretical categories: Individual, Interpersonal, and Community (a socio-economic domain is not included in the childhood model, because socio-economic status factors are considered a function of the family environment and therefore an interpersonal level factor). It was hypothesized that childhood variables would be most strongly related to the theoretically related domains in adulthood (e.g. childhood individual level factors will be most strongly related to individual level indices of social capital in adulthood, and so on.)

The following discussion section will explore the results for each of two the proposed hypotheses and how they fit into the current literature base surrounding social capital. Implications of these findings will be discussed.

**Hypothesis One: A multidimensional measure of social capital in adulthood**

I hypothesized that four domains could index social capital in adulthood: individual (prosocial behavior and social competence), interpersonal (aggression, popularity, and social support), socio-economic (education and occupation), and community (religiosity and neighborhood collective efficacy). Although model fit was adequate, two of the originally proposed variables did not fit as well within the model as the others: pro-social behavior and religiosity. When these two variables were removed from the model, fit indices improved significantly. Therefore, the originally hypothesized model held up in terms of the four proposed domains, but the specific variables proposed to make up the individual and community level domains were not fully supported.

The findings that prosocial behavior and religiosity did not fit the measurement model of social capital were somewhat contrary to the existing literature. Prosocial behavior has been
suggested to increase the quality of a person’s relationships with others -- a variable that is considered a definitional component to social capital (Adler & Kwon, 20002; Pulkkinen et al., 2002). The present findings suggest that social capital may not be as strongly impacted by prosocial behavior as originally thought. It may be that the presence or absence of prosocial behavior itself does not significantly increase social capital, and that perhaps the relationship between sociability and social capital is better accounted for by the presence of aggressive or anti-social behavior, which would reduce it.

Another implication of this finding about prosocial behavior may be that some types of social capital benefits are bestowed to individuals regardless of the quality or strength of their relationships with others. Granovetter (1973) proposed the idea that although “weak ties” with others are not historically considered to be as important or as high quality as “strong ties,” these more distant connections are still very important because they allow individuals and communities to reach beyond insular groups. Social Network theory further supports this proposition that weak ties are important for expanding connections to diverse groups and therefore increasing access to a larger number of diverse resources (Borgatti & Halgin, 2011).

Furthermore, several social capital researchers have espoused religiosity as a particularly important factor of community level social capital due to the inherent quality of religious connections which encourage good will to others and civic engagement and volunteer work (Putnam, 1995). The present results suggest that religiosity -- or more specifically, an individual’s frequency of church attendance -- is not a significant component of the social capital construct. One implication of this finding is that perhaps the strength of an individual’s connection to the church community (e.g. participation in volunteer or civic engagement groups, parenting groups, social events and dinners, etc.) is the active ingredient that contributes to social
capital. This type of involvement was not accounted for in the current measurement model and rate of attendance alone may not be sufficient to capture the complex components of religious affiliation that contribute to social capital.

Overall, the hypothesized measurement model of social capital was supported by confirmatory factor analysis, suggesting that social capital is indeed determined by both developmental and contextual level variables and can be accounted for with an ecological systems model. This finding has implications for the future measurement of social capital, in that it provides a model that accounts for multiple dimensions of the construct. Past literature has described ongoing debate about how best to define and measure social capital, with a myriad of proposed options (e.g., Bjornskov and Sonderskov, 2013; Portes, 2000). Often, in order to measure social capital, one single index is selected to represent the entire construct. This approach has flaws because there are multiple sources for social capital and only examining a single index could result in researchers missing large pieces of the construct. It may also be the case that groups of individuals have social capital in areas that others do not (e.g., having large amounts of community social capital in terms of neighborhood connection and efficacy, but having low interpersonal social capital in terms of close relationships with family, friends, and significant others). Only measuring one index or even one domain of social capital but labeling this as the broad category could be misleading and scientifically imprecise.

Ultimately, while it does appear that social capital research has been moving toward more multi-dimensional approaches that would account for more indices (e.g., Brehm & Rahn, 1997; Kirst, et al, 2015; Onyx & Bullen, 2000; Woolcock & Narayan, 2000), this study provides one of the first ecologically informed and comprehensive models for doing so. Although the present measurement model is certainly not complete in terms of accounting for all possible indices of
measurement, this proposed model of social capital provides a framework for conceptualizing and organizing the components of a complicated construct that can be built upon in future study and research.

**Hypothesis Two: Childhood precursors of adulthood social capital**

I hypothesized that factors in childhood would be significantly related to levels of social capital in adulthood and that these connections would be strongest between theoretically related domains. I proposed that childhood factors would fit a similar model: Individual (guilt, confession, and cognitive abilities), Interpersonal (aggression, popularity, child rearing context, and family socio-economic status), and Community (religiosity) domains.

Analyses did not support a cohesive measurement model of childhood precursors of social capital. This suggests that childhood precursors of social capital may be indexed by different variables than adult social capital, and that they may better fit in different conceptual domains. A cohesive model may have been found if more childhood specific indices of social capital were included in the model. Based on literature, additional variables that may have been of use would be more detailed measures of the parents’ social capital, the child’s involvement in extra curricular activities both within and beyond the school setting, community service activities, and work outside the home (e.g. Chin & Phillips, 2004; Fan, 2008; Ferguson, 2006; Leonard, 2005). These variables were not collected in the Columbia County Longitudinal Study in Wave 1.

Second, while there were several connections found between the selected childhood variables and the four latent domains of adult social capital, the presence and strength of these connections differed by gender. It was not the case that these connections were strongest between theoretically related domains (e.g., individual precursors were most strongly related to
individual indices). The specifics of these results will be discussed in two ways: First, I will discuss implications of results by considering specific childhood variables that were related to multiple latent domains of social capital, and therefore are the most prominent precursors. Second, I will discuss implications and gender differences in terms of which groupings of childhood variables predicted each of the adult domains.

**Prominent Childhood Precursors**

For males, there were two childhood variables that were significant precursors to three out of the four latent domains of social capital: childhood aggression and cognitive ability. These variables both were identified as precursors to interpersonal, socio-economic, and community level social capital. Additionally, aggression and cognitive ability were marginally significant precursors to the fourth domain: individual social capital. These results suggest that for males, aggressive behavior as a child and cognitive ability (IQ) may be particularly important for the development of adult social capital. There are several hypotheses for why aggression and cognitive ability may be stronger precursors to social capital across the board for men than for women.

First, Huesmann, Dubow, and Boxer (2009) found that in the same Columbia County data set as used in the current study, males exhibited greater levels of aggressive continuity over each wave of the study compared to females, from age 8 to age 48. This suggests that more men from this dataset would fall into the “life course persistent” model of aggression than females. This relationship alone could explain the differential results in predicting adult social capital, because some female children who are highly aggressive as children will grow out of these behaviors, therefore reducing the impact of childhood aggression on their adult relationships. Furthermore, meta-analysis supports that men generally engage in forms of aggression that are
more likely to be physical, verbal, and dangerous (‘risky’), with little difference between
genders in terms of more indirect aggressive behavior (Archer, 2004). It may be the case that the
current measurement of aggressive behavior is skewed in the direction of measuring masculine
expressions and that women’s aggressive expressions that may impact their social capital are not
presently being measured (e.g., “displaced aggression” or indirect aggression; Archer, 2004). It
may also be the case that men’s aggressive tendencies are more likely to be interpreted as
offensive or threatening to the safety of others, which would result in fewer and lower quality
relationships.

Second, research has demonstrated that higher IQ is related to increased social
competence (Murphy & Hall, 2011). Considering a social context, the present findings may be
partially accounted for by society’s differing expectations for what qualities are considered
desirable in social relationships with men and women. Although speculative, male relationships
may be influential in success in hierarchical settings (such as the workplace) and more focused
on cooperation with others for women. In this case, IQ would be more important for establishing
social connections for men than women.

For females, there was one childhood variable that was a significant precursor to three
out of four latent domains of social capital: religiosity. The frequency of parent church
attendance as a child appears to be a precursor to individual, interpersonal, and socio-economic
social capital domains in adulthood for females. Research has long shown that women are
generally more religious than men (e.g. Vaus & McAllister, 1987; Maselko & Kubzansky 2006).
It may also be the case that there are differences in the way men and women interact with and
connect with religious organizations and fellow members, particularly in religious organizations
where traditional gender roles are upheld. If this is the case, it may be understandable that social
groups and civic engagement organizations surrounding the church are more oriented toward fostering female connections based around community care and motherhood. If women are more likely to have this exposure as children, they are likely gaining social skills, observing successful relationships, and gathering general experience that would be helpful as they build their own lifetime social capital in terms of social competence, education and occupation, and social support relationships with others. It is unclear however, why religiosity of parents in childhood does not precede later community social capital (social cohesion, feelings of reciprocity, trust with others).

Childhood Precursors Of Specific Domains Of Adulthood Social Capital

The individual domain of adulthood social capital (feelings of social competence) was predicted by several of the childhood variables. Women appear to gain feelings of social competence in adulthood when they have experienced more positive family relationships as children (e.g., receiving fewer harsh punishments, witnessing less disharmony between parents), felt more guilt when doing something wrong, and had a mother attending church more often. Men appear to have higher feelings of social competence in adulthood when they have been less aggressive as children and have more advanced cognitive abilities. It seems theoretically consistent that each of these childhood variables would have an impact on perceived social competence; however, the reason for gender differences are less clear. It may be the case that these differences are explained by differential ways in which men and women evaluate their own social competence (e.g., men by reflecting on their own personal attributes and women from their past interpersonal experiences).

In terms of the interpersonal domain of adulthood social capital indices, men described having more social support and higher quality relationships with their spouses when they felt
more guilty for wrongdoing as children, had more advanced cognitive abilities, and exhibited lower levels of aggression as children. Women described these interpersonal experiences in adulthood when their mother attended church more regularly in childhood. These gender differences may be accounted for by differential and culturally driven expectations and values that people have for their relationships with men and women. Men and women may also learn how to have positive relationships with other people through different means. For women, this may be from more community settings, such as religious organizations. For men, it may be more related to the way their environment rewards or punishes them for their behavior (e.g., aggression, expressing guilt, being able to fit in).

In regard to community level social capital, neighborhood efficacy was similarly preceded by lower aggressive behavior and higher cognitive ability for both males and females. In addition, family socio-economic status as a child also contributed to community level social capital for females. Although this domain has the most overlap between genders, the sparse number of precursors to adult community social capital supported in this model suggests that there may be other essential variables in childhood not presently measured which would account for levels of cohesion, trust, and reciprocity in adulthood.

For both men and women, many of the individual, interpersonal, and community level variables in childhood significantly or marginally predicted socio-economic level social capital. These variables include childhood confession, cognitive ability, aggression, child-rearing context, family socio-economic status, and religiosity. Overall, these findings indicate that socio-economic factors of social-capital in adulthood such as occupation and education are highly influenced by a variety of internal personality traits, interpersonal relationship factors, and community connectivity that are independent of gender.
Limitations

There are several limitations to the current study design, mostly precipitated by the use of an existing prospective data set that began in 1960 and that was not originally conceptualized to assess social capital. One important consideration is the potential for cohort effects. Because these data were collected over the span of 1960-2000, it is possible that there are generational differences between this population and others. For instance, the population in this study was raised in a very different version of American culture -- especially when it comes to gendered expectations and exposure to technology -- which may impact the relevance and significance level of childhood precursors to adult social capital. Of particular concern is that the current study did not have a measure of technology use related to social relationships; the generation of individuals who participated in this study (age 8 in 1960) was not raised with technology or as adept at using it as individuals would be were the study replicated with younger generations today.

Furthermore, the CCLS sample population is not representative of the larger US population because participants all came from the same county in New York. While helpful for ruling out confounds (internal reliability), this is not as useful for extrapolating findings to the larger population (external reliability). Also, the racial diversity was lacking in that less than 5% of the study population were non-white. It may be the case that differences might also exist between racial groups that are not accounted for in the present study.

Additionally, by utilizing data that had already been collected, there is no opportunity to tailor study design and measures used. As such, it was difficult to account for other factors that might go into a multi-dimensional construct such as social capital or to ensure that the measures selected were specific to the construct. Analyses of intercorrelations among the latent social
capital domains in adulthood suggested that while the domains were mostly related, the domains of socio-economic and community social capital were more likely to be weakly connected with the others. This suggests the measures for these two domains are either lacking in specificity or missing important elements.

When considering the amount of specificity, the socio-economic and community domains of social capital in adulthood contained some fairly broad measures that could be considered to be outside the construct of social capital. For instance, simple occupation status and level of education alone may not be capturing the contribution of socio-economic variables to social capital. More fine-grained measures might include asking about the number and types of connections a person has established with others through their job or educational experiences, rather than just basing amount of social capital on the prestige level itself. Thinking about the community level index of religiosity, the fact that this variable did not fit into the proposed measurement model of social capital could have been due to the broad measure used for religiosity: frequency of church attendance. A more specific measure for this may have been the specific number and nature of relationships with others at church, or number of hours spent on activities outside of regular services. In general, future social capital research should further explore the active mechanisms through which social capital is accumulated in order to improve upon specificity of measurement models and subsequently the practical use of the construct.

In future research, it would also be beneficial to expand the current measures of social capital to include more robust indices for each domain. For example, additional measures could include information about more personality factors that contribute to sociability, information about the number of interpersonal relationships a person has (not just the quality of them), and details about the participant’s civic engagement (e.g. Adler & Kwan, 2002; Brehm & Rahn,
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1997; Onyx & Bullen, 2000; Woolcock & Narayan, 2000). Additionally, using the more comprehensive model to further inform distinctions between strong and weak ties (Granovetter, 1973; Borgatti & Halgin, 2011) as well as communal and individual sources of social capital (Kirst, et al., 2015), may be important contributions to future research.

Generally, research interest in social capital has been growing rapidly. This project suggests that one of the most comprehensive ways to measure social capital is to do so in a multi-dimensional, ecologically framed model. This is a potential downside for researchers because it makes it very difficult to use the construct in research without collecting large amount of data on many variables. It may be the case that future research would best be served by thinking of social capital in terms of its sub-domains and being more explicit about which is being measured. This approach would additionally prevent specific indices from being mislabeled as “global social capital.” Another consideration would be to focus on creating a single, standardized measure of social capital that accounts for each of the domains and indices with reliability.

Conclusions

Despite these limitations, results from the present study contribute to social capital literature on several important fronts. First, the results provide preliminary evidence that a comprehensive measurement model of social capital based on domains can be effectively created. This comprehensive method has the potential to help reduce debate in the field about the construct of social capital by defining subdomains and identifying a comprehensive model for measurement. Second, the longitudinal findings of this study suggest that adult levels of social capital are multi-determined by a variety of experiences extending 40 years back toward childhood and may differ based on gender. For instance, key precursors appear to be aggression
and cognitive ability for men, and religiosity for women, while a variety of other specific precursors impact specific types of adult social capital differentially by gender. Given the documented importance of social capital for improving a variety of social, occupational, health, and general wellbeing outcomes, understanding precursors may have important clinical implications for fostering social capital accumulation in individuals across the lifespan.
Table 2
*Means and Standard Deviations for the Indices of Adult Social Capital by Gender*

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**Note.** Inter-correlations for males are presented above the diagonal and inter-correlations for females are presented below the diagonal.

* p < .05.  ** p < .01.
Table 4

Inter-Correlations among Adult Social Capital Domains

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Note. Inter-correlations for males are presented above the diagonal and inter-correlations for females are presented below the diagonal.

* *p < .05.  ** *p < .01.  *** *p < .001.
### Table 5

*Means and Standard Deviations for the Indices of Adult Social Capital by Gender*

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*Note: *p < .05, **p < .01, ***p < .001*
Table 6

*Inter-correlations among the Childhood Precursor Variables*

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*Note.* Inter-correlations for males are presented above the diagonal and inter-correlations for females are presented below the diagonal.

* p < .05. ** p < .01.
Table 7

**Childhood Precursors to Adult Social Capital Domains**

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*Note.* An X indicates a significant relationship between a childhood variable and a latent domain of social capital (p value less than .05).
Figure 2. Conceptual Measurement Model of Adult Social Capital. Rectangles on the right side of the model represent manifest variables measured in the Columbia County Longitudinal Study data set. Ovals on the left side of the model represent theoretical domains of social capital based on an ecological systems model.
Figure 3. Constrained Measurement Model of Adult Social Capital. The constrained (by gender) measurement model of adult social capital as conducted in Structural Equation Modeling Software, Amos (Version 18.0). $CMIN/DF = 1.56$, $CFI = .935$, $RMSEA = .026$. Reported values represent unstandardized measurement weights which are identical for males and females in the constrained model (the standardized values are slightly different for males and females in the constrained model because of different standard errors). All estimates are significant at $p \leq .01$. 
Figure 4. Conceptual Longitudinal Predictive Model of Adult Social Capital. The proposed conceptual model of childhood variables predicting the ecological domains of adult social capital. It is hypothesized that theoretically consistent variables in childhood will more strongly predict social capital outcomes of the theoretically consistent latent domains in adulthood. Connections hypothesized to be stronger are indicated with bold black lines, while connections hypothesized to be weaker are indicated in grey.
Figure Captions, Figures 5 – 7

Figure 5. Individual Level Childhood Precursors of Adult Social Capital Latent Domains
The unconstrained predictive model of childhood individual level precursors of adult social capital as conducted in Structural Equation Modeling Software, Amos (Version 18.0). $CMIN/DF= 1.382, CFI=.949, RMSEA=.021$ Reported values represent standardized regression/structural weights.

Figure 6. Interpersonal Level Childhood Precursors of Adult Social Capital Latent Domains. The unconstrained predictive model of childhood interpersonal level precursors of adult social capital as conducted in Structural Equation Modeling Software, Amos (Version 18.0). $CMIN/DF= 1.369, CFI=.939, RMSEA=.021$. Reported values represent standardized regression/structural weights.

Figure 7. Community Level Childhood Precursors of Adult Social Capital Latent Domains. The unconstrained predictive model of childhood community level precursors on adult social capital as conducted in Structural Equation Modeling Software, Amos (Version 18.0). $CMIN/DF= 1.613, CFI=.905, RMSEA=.027$. Reported values represent standardized regression/structural weights.
Figure 5. Individual Level Childhood Precursors of Adult Social Capital Latent Domains

Path is significant for males
Path is significant for females
Path is significant for both males and females

† p = .05 to .09
* p < .05
** p < .01
Figure 6. Interpersonal Childhood Precursors of Adult Social Capital Latent Domains

Path is significant for males
Path is significant for females
Path is significant for both males and females

† p = .05 to .09
* p < .05
** p < .01
*** p < .001

AGE 8
Interpersonal Level Factors

Aggression
Popularity
Child Rearing Context
Family SES

AGE 48
Adult Social Capital Latent Domains

Individual
SES
Interpersonal
Community
Figure 7. Community Level Childhood Precursors of Adult Social Capital Latent Domains

Path is significant for both males and females

Path is significant for males

Path is significant for females

** p < .01

* p < .05
REFERENCES


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