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Examining the Role of Organized Afterschool Activities from a Bioecological Perspective

DISSERTATION

submitted in partial satisfaction of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

in Education

by

Yangyang Liu

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DEDICATION

To

my loving family,

for their unwavering support

through ups and downs.

To

my husband and daughter,

for bringing me happiness and light

in times of challenge and despair.

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ABSTRACT OF THE DISSERTATION

Examining the Role of Organized Afterschool Activities from a Bioecological Perspective

By

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Doctor of Philosophy in Education

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Professor Sandra D. Simpkins, Chair

Organized afterschool activities present great potential to support individuals' positive development. Despite the general findings on the positive role of organized afterschool activities on individual development, existing studies have been limited in multiple ways. They have often focused on the quantity of participation or the amount of time individuals spend in activities and only rarely on the quality of experiences in the activities although both aspects are likely important. In addition, studies have considered activities during a snapshot of development and have not examined activities across the life span. Finally, only limited empirical research has considered the potential pathways by which activities are linked to individual functioning. Situated within the bioecological perspective, the current dissertation examines the quantity and quality of experiences in organized afterschool activities and their associations with individual development.

Using data from the National Institute of Child Health and Human Development Study of Early Child Care and Youth Development (NICHD SECCYD), this dissertation consists of three studies. The first study examined the developmental pathways linking the quantity and quality of experiences in 6th grade organized afterschool activities to academic performance at the end of high school via activity participation and academic skills at age 15. Path analyses results

indicated that adolescents who participated in organized afterschool activities for more days and those who reported higher quality activity experiences in 6th grade participated in organized afterschool activities for more days and reported more positive experiences at age 15. Age 15 activity participation formed an indirect pathway linking 6th grade activities to 12th grade academic performance. In addition, organized afterschool activities in 6th grade promoted academic skills at age 15, which were carried forward to 12th grade. The second study examined the association between four types of adolescent organized activities (i.e., sport, art, volunteer/community services, and religious youth groups) and leisure time activities in adulthood at age 26. Findings suggested that longer duration and higher levels of enjoyment in adolescent activities were both associated with participation in adult leisure time activities of the same type. In addition to within-type associations, cross-type association were also observed. Study 3 examined the quality of children's relationships with three adults (afterschool program staff, classroom teachers, and mothers) in 1st grade in relation to children's academic, social-emotional, and behavioral adjustment at school one year later in 2nd grade. Regression results showed that more relational conflict with afterschool staff in 1st grade was associated with lower social self-control and more externalizing behaviors one year later. Relational closeness with afterschool staff was not related to children's school adjustment the following year. Findings from the current dissertation highlight the importance of examining both quantity and quality of experiences in organized afterschool activities, as well as delineating potential pathways linking organized activity participation to individual development.

Keywords: organized afterschool activities, developmental pathways, microsystem, sustaining environment, quality, enjoyment

INTRODUCTION

Organized afterschool activities are an important part of the lives of children and adolescents. These activities are structured contexts, often with adult leaders and a group of youth coparticipants. They include sports and arts extracurricular activities, clubs, as well as five-day-a-week afterschool programs. They are often offered outside of the regular school hours and can be held at various locations, including schools, communities, churches, as well as afterschool organizations (Vandell, Larson, Mahoney, & Watts, 2015). According to a recent report by Afterschool Alliance, about 7.8 million school-age youth in the U.S. participate in organized afterschool activities (Afterschool Alliance, 2020). These activities are considered as contexts that promote positive youth development as they provide various kinds of enrichment activities, opportunities for skill development and character building, as well as connecting youth with positive peers and caring adults (Lerner et al., 2005).

Although the literature generally suggests that participating in organized afterschool activities is linked to positive functioning both concurrently and longitudinally (Fredricks & Eccles, 2006; Gardner, Roth, & Brooks-Gunn, 2008; Haghighat & Knifsend, 2019; Vandell et al., 2015), researchers have highlighted that these links may vary depending on the *quantity* and the *quality* of the activity experiences (Durlak, Weissberg, & Pachan, 2010; Hirsch, Mekinda, & Simpkins, 2015; Stawicki, 2010; Vandell et al., 2015). Some researchers have found that participation in activities is only associated with positive adjustment if the activity is of high quality (Durlak et al., 2010). Nevertheless, most existing studies characterize the quantity of youth's activity participation in terms of the amount of time youth spend there (e.g., intensity, dosage, duration). There is limited research on the quality of experiences in organized activities and its associations with individuals' functioning (Kataoka & Vandell, 2013; Viau, Denault, &

Poulin, 2015). Thus, the current dissertation takes into account both the quantity (i.e., intensity, duration) and quality of activity participation and their associations with individuals' functioning.

Guided by bioecological theory (Bronfenbrenner & Morris, 1998, 2006), the current dissertation explores three issues related to the quantity and quality of activity participation. First, I examine the association between quantity and quality of organized afterschool activities and their associations with individual adjustment in three developmental periods: childhood, adolescence, and adulthood. Second, I explore the contextual and individual mechanisms linking the quantity and quality of activity participation to individual development. Finally, I examine experiences in organized afterschool activities while taking into account multiple microsystems and experiences in other key developmental contexts, including family and school. Next, I will introduce the theoretical framework of the dissertation, followed by a review of existing literature on organized afterschool activities with identification of gaps that are addressed by the current dissertation.

Situating Organized Afterschool Activities in a Bioecological Perspective

This dissertation is situated within the bioecological theory of development, which emphasizes studying of development within ecological contexts (Bronfenbrenner & Morris, 1998, 2006). According to bioecological theory, the microsystem captures the immediate environments of development, where individuals have direct contact with social partners as well as physical objects. Aligning with these theoretical views, the current dissertation examines organized afterschool activities as an important microsystem of development for youth. Specifically, I draw upon several propositions from the bioecological theory, including its focus on *proximal processes*, the importance of incorporating *time* into the study of microsystems, the

role of *person* characteristics as both outcomes of and resources for development, and the simultaneous examination of multiple microsystems.

In the most recent formulation of the bioecological theory, Bronfenbrenner and Morris (2006) argued that proximal processes are the primary engines of development. Proximal processes are defined as "particular forms of interactions" between individuals and their immediate environments. However, in order to be effective, these proximal processes "must occur on a fairly regular basis over extended periods of time" (Bronfenbrenner & Morris, 2006, p. 820). Although bioecological theory emphasizes both the amount of time and quality of experiences in proximal processes, research on organized activities has largely focused on the amount of time, with much less attention on the quality of proximal processes in these activities. In order to capture a more complete picture of activity participation, the current dissertation focuses on both the quantity and quality of experiences in organized afterschool activities and their associations with individual development.

According to the bioecological theory, time should be considered as a key dimension in the study of development in microsystems (Bronfenbrenner & Morris, 2006). On one hand, time captures the regularity and consistency of proximal processes as noted earlier. On the other hand, time encompasses development of individuals and changes in the microsystems that occur over time. Extending the bioecological perspective on time, life-course theory further emphasizes the importance of studying development over time and the need to examine potential pathways linking earlier experiences to subsequent functioning (Elder et al., 2015). In this dissertation, I draw upon these propositions from the bioecological theory and life-course theory to study the longitudinal associations between organized activities and individual development from

childhood to adulthood. In addition, I explore potential developmental pathways linking organized afterschool activities to individual functioning.

In the bioecological theory, individuals and their development are theorized to be both a product of the proximal processes and a producer of future development. Specifically, the adjustment of the person is developmental outcome as a result of the proximal processes in the microsystem. In addition, individual adjustment becomes *resource* that promote future development. Most existing studies on organized afterschool activities examine individual adjustment as developmental outcome related to activity participation. This approach has provided a rich literature on the positive associations between activity participation and individuals' academic, psychological, as well as behavioral wellbeing (see Vandell et al., 2015 for review). In contrast, much less work has explored how activities promote individual development, which in turn function as *resources* for future development. To address this gap, the current dissertation examines individual characteristics both as developmental outcomes as well as an indirect mechanism linking earlier participation to later functioning.

Finally, the bioecological theory recognizes that individuals develop within multiple microsystems. These individual microsystems do not function independently, but may assert influence upon each other. Millions of U.S. youth experience multiple proximal contexts, including families, schools, and afterschool activities on a regular basis (Afterschool Alliance, 2020). Organized afterschool activities, therefore, constitute one of the developmental contexts within a broad ecology of development. Despite the theoretical conceptualizations of individual development within multiple microsystems, research has traditionally examined various microsystems (e.g., organized afterschool activities, school, family) in separate literatures (Contreras, Kerns, Weimer, Gentzler, & Tomich, 2000; O'Connor, 2010; Pierce, Bolt, &

Vandell, 2010; Pierce, Hamm, & Vandell, 1999; Simpkins, Weiss, McCartney, Kreider, & Dearing, 2006). In order to capture the interrelatedness of multiple microsystems, this dissertation simultaneously examines individuals' experiences in organized afterschool activities, schools, and families.

A Developmental Approach

Although the broad aim of the dissertation is to explore the association between organized afterschool activities and individual development, this goal is approached with a developmental lens. Specifically, the three independent papers in this dissertation focus on three development periods, including childhood, adolescence, as well as adulthood. In each of the three papers, I explore questions that are meaningful for specific developmental periods. In addition, as the study of developmental mechanisms is also a key component of developmental research (Elder et al., 2015), the current dissertation takes advantage of transitions across developmental periods (e.g., childhood to adolescence) or contexts (e.g., middle to high school) to study potential pathways linking the quantity and quality of activity participation to individual functioning.

For children transitioning to elementary school, adult caregivers remain the most important facilitators of their daily life. According to developmental theories and empirical research, the relational processes that transpire between children and key adult caregivers in various microsystems constitute the main engine for development (Bronfenbrenner & Morris, 2006; Contreras et al., 2000; Pianta,1999). The central role of adult caregivers in children's development makes it worthwhile to study children's relationships with key adult caregivers in multiple contexts and their associations with individual adjustment. Compared with the rich research in family and school settings (Contreras et al., 2000; Heatly & Votruba-Drzal, 2017;

Silver et al., 2010), much less work is done to examine adult-child relationship in organized afterschool activities and its association with children's development (Pierce et al., 1999; 2010). To address this gap, this dissertation simultaneously explores children's relationships with key adult caregivers in five-day-a-week afterschool programs, schools, and families, and their associations with children's school adjustment.

Developmental psychologists generally agree that one of the main tasks during adolescence is to be prepared for eventually becoming a competent adults (Erikson, 1968; Hall, 1904). Among the many competencies to be developed, academic excellence remains a central topic for adolescents' thriving. Research on organized afterschool activities finds that these activities can connect adolescents with adult role models and academically-oriented peers (Bohnert et al., 2010). In addition, organized activities provide various enrichment experiences that foster academic skills, such as a positive work orientation (Broh, 2002; Larson & Angus, 2011; Morris, 2016). However, previous work tends to focus on a snapshot of adolescence such as middle school or high school (Fredricks, 2012; Poulin & Denault, 2015), with little research covering an extended period of adolescence. Building on existing literature, the current dissertation examines the developmental pathways linking organized afterschool activities in 6th grade and adolescents' academic performance at the end of high school.

Adolescence is also a period for identity exploration and consolidation (Erikson, 1968). Researchers find that adolescents engage in various identity exploration experiences in organized afterschool activities as they interact with diverse adults and peers, as well as a wide range of activity content (Eccles & Barber, 1999). As a matter of fact, adolescents reported participating in a specific activity corresponds to their sense of self and identity (Eccles & Barber, 1999). If activity participation promotes identification with a specific activity, it would be worthwhile to

examine if activities participated during adolescent years could prepare individuals' participation in related activities when they are adults. Therefore, the current dissertation also examines the association between adolescent organized activities and leisure activity choices in adulthood.

Quantity and Quality of Participation in Organized Afterschool Activities

Quantity of participation. According to bioecological theory, activities that are engaged in on more regular basis over longer periods of time would have greater effects (Bronfenbrenner & Morris, 1998, p.996). It is argued that, to be developmental effective, activities must continue long enough to become increasingly more complex. According to this perspective, activities that only happen sporadically and that are often interrupted will not do the job. In the context of organized activities, individuals need to participate at a regular frequency in an activity setting to stay involved with activity content and adult leaders and peers. It also takes extended period of time for individuals to explore opportunities in activities, develop skills and interpersonal connections, and internalize prosocial norms that might help them succeed (Bohnert et al., 2010; Busseri & Rose-Krasnor, 2009). However, because activities are often voluntary, youth vary on how much time they spend in activities on a regular basis (e.g., weekly) and how long they participate in an activity. To capture variation in activity participation on a weekly and annual basis, I focus on both the intensity and duration of experiences in organized afterschool activities. Intensity is a widely used indicator of quantity of participation, capturing the average amount of time or frequency of participation in organized activities during a particular timeframe (e.g., week or month) (Bohnert et al., 2010). Duration focuses on length of involvement over an extended period of time and is typically measured in terms of the number of years (Bohnert et al., 2010).

Consistent with bioecological theory, research has shown that greater intensity and longer duration of activity participation are associated with more positive impacts than less exposure (for review, see Vandell et al., 2015). For example, Fredricks (2012) found that more time spent in organized activities in a typical week in 10th grade was linked with higher grade point averages and math achievement test scores in 12th grade. Although less studied, duration of participation is a particularly strong predictor of individual functioning (Vandell et al., 2015). In their metanalysis, Roth et al. (2010) identified 12 studies, among which 42% reported significant associations between program duration and academic performance, indicating larger effects for more than one year of participation. While quantity of participation is an important aspect of participation, a limitation of existing studies is that activity quality was not typically considered. Focusing on quantity of participation alone overlooks some of the nuances of participation, a critical aspect of which is the quality of activity experiences.

Quality of experiences in activities. Bioecological theory proposes that it is not just about time in an activity, but the quality of the proximal processes that capture individuals' experiences in these activities that play a role in their development (Bronfenbrenner & Morris, 1998, 2006). Quality of experiences captures the proximal processes in organized activities, and there is some evidence that these processes also are related to child and adolescent functioning (Roth & Brooks-Gunn, 2016; Vandell et al., 2015). Researchers have proposed various indicators of youth's quality experiences in activities. In their seminal work, Eccles and Gootman (2002) proposed eight features of high-quality youth programs: physical and psychological safety, appropriate structure, supportive relationships, opportunities to belong, positive social norms, support for efficacy and mattering, opportunities for skill building, integration of family, school, and community efforts. Although Eccles and Gootman (2002) proposed a comprehensive list of

quality indicators, researchers have typically focused on a subset of quality indicators. The current dissertation focuses on four quality indicators that have been studied or argued to be critical, including adult-youth relationships (Hirsch, 2002; Jones, & Deutsch, 2011), peer group interactions (Poulin & Denault, 2015), positive affective experience such as the enjoyment of activity (Shernoff, 2010), as well as opportunities for skill development (Durlak et al., 2010).

Among other quality indicators, adult-youth relationships in organized afterschool activities have received great attention. A sense of relatedness is a fundamental psychological need (Deci & Ryan, 2012). Bioecological theory also emphasizes that interpersonal relationships are at the core of proximal processes of development (Bronfenbrenner & Morris, 2006). Aligning with these perspectives, positive relationships between youth and adult leaders are described as "critical mediums" of development in organized activities (Eccles & Gootman, 2002). Previous research suggests that positive leader-youth relationships facilitate the learning process and amplify developmental benefits in organized activities (e.g., Griffith & Larson, 2015). For example, previous research on both children and adolescents find that positive relationships between activity leaders and youth are associated with gains in work habits and task persistence (Kataoka & Vandell, 2013), as well as higher academic grades (Pierce et al., 2010). Another aspect of relational processes in organized activities is related to peer interactions. As organized activities are often group based with presence of other peer participants, interactions with coparticipants constitute an important aspect of activity experiences. Peers play a particularly important role in adolescents' activities as individuals gain increasing autonomy in adolescence in choosing their social partners and become more independent from adults. Being part of the peer group is found to be an important source of support for adolescents' engagement and learning in organized activities (Larson & Brown, 2007; Salusky et al., 2014).

In addition to interpersonal processes, a sense of enjoyment and opportunities for skill development also capture important aspects of the quality of experience in organized activities. According to the expectancy-value theory (Eccles, 1983), enjoyment in an activity indicates a sense of intrinsic value of the activity. This sense of intrinsic value in an activity is theorized to promote engagement and learning, as well as future choice to involve in similar activities. Scholars in the field of organized activities argue for the inclusion of enjoyment when examining quality of experiences in organized activities (Shernoff, 2010). Finally, as adolescents are developing into more competent individuals, the extent to which organized activities foster skill development is also a critical indicator of activity quality and have important implications for adolescents' sense of competence and autonomy (Deci & Ryan, 2000; Durlak et al., 2010; Eccles, 1983; Eccles & Gootman, 2002). Guided by developmental theories (Bronfenbrenner & Morris, 1998, 2006) and empirical work, the current dissertation takes into account multiple indicators of activity quality including relationships with adults and peers, a sense of enjoyment in activities, as well as opportunities for skill building.

Mechanisms linking Organized Afterschool Activities and Development

Delineating processes of continuity and change is a fundamental issue in developmental research (Bronfenbrenner & Morris, 2006; Elder, Shanahan, & Jennings, 2015). Specifically, bioecological theory has proposed two general pathways that may influence individuals' later functioning: subsequent contexts and individual skills (Bronfenbrenner & Morris, 2006). Recently, scholars have applied these theories to examine associations between youth's organized afterschool activities and later functioning, arguing that youth's participation in organized afterschool activities at one time point is meaningful for their long-term functioning

through two pathways: activity participation pathway and skill development pathway (Nelson, 2017; Vandell, Simpkins, & Liu, 2020).

Previous intervention studies suggest that program effects are more likely to be maintained when programming is sustained over time (Ramey & Ramey, 2006). The activity participation pathway is consistent with conceptualizations of "sustaining environments" (Bailey, Duncan, Odgers, & Yu, 2017; Vandell, et al., 2020). Specifically, researchers propose that continued participation in organized activities form a "ladder of opportunities" in which participation at an earlier time point prepares youth for future activity opportunities that continue to support positive development (Nelson, 2017). Although no studies have formally tested these propositions, existing research sheds some light on these pathways. For example, Simpkins and colleagues (2010) found that more time spent in sports and music activities in elementary school predicted more participation in middle school, and Denault and Poulin (2009) found small to moderate stability in intensity of activity participation from middle to high school.

The skill development pathway is consistent with bioecological theory's proposition that positive experiences in proximal contexts promote the development of skills and competences that then become *resources* and *assets* for later development (Bronfenbrenner & Morris, 2006). Studies provide emerging support for individual functioning as a potential pathway linking earlier participation to subsequent functioning. For example, researchers find that positive leader and peer interactions are related to adolescents' development of academic competence (Hirsch, 2005) and positive work orientation (Kataoka & Vandell, 2013; Shubert, Wray-Lake, & McKay, 2020). Despite these associations, studies have not simultaneously examined activity participation and individual skills as possible developmental pathways linking quantity and quality of experiences in organized afterschool activities to subsequent adjustment.

Overview of Studies

I use the longitudinal dataset of National Institute of Child Health and Human Development Study of Early Child Care and Youth Development (NICHD SECCYD) for this dissertation. The NICHD SECCYD dataset is well suited for these three dissertation studies because the dataset follows 1,364 individuals from birth to age 26. In addition, the dataset includes extensive longitudinal data about individuals' participation in organized afterschool activities as well as various measures of individual adjustment and developmental outcomes, such as academic performance and adult leisure activities. Furthermore, the dataset consists of rich information on family demographics, which are included in all three studies as important covariates of adolescents' organized activity participation and developmental functioning.

Study 1 extends the current knowledge on organized afterschool activities by examining developmental mechanisms linking the quantity (i.e., intensity) and quality of activity participation at the beginning of middle school to adolescents' academic performance at the end of high school. Two developmental mechanisms are investigated: an activity pathway where the quantity (i.e., intensity) and quality of activity participation at the beginning of middle school predicts activity participation at the beginning of high school, which then is associated with academic performance at the end of high school; the second pathway is an individual skills pathway, such that middle school activity participation predicts academic skills at the beginning of high school, which are then carried forward and related to higher academic performance at the end of high school.

Study 2 examines the associations between organized afterschool activities in adolescence and leisure time activities in adulthood. Specifically, I explore if the duration and quality of experiences in adolescents' organized activities (i.e., sport, art,

volunteering/community services, and religious youth groups) are associated with leisure time activities in adulthood. This study contributes to literature as it examines continuity of development over a prolonged period of time. In addition, by focusing on multiple activities in the same study, this study allows to examine if the association between adolescent organized activities and adult leisure time activities will be observed within or across different types of activities.

Study 3 explores the role of organized afterschool activities together with other key developmental contexts. Specifically, I investigate the association between adult-child relationships in afterschool programs in 1st grade and children's school adjustment in 2nd grade, while taking into account children's relationships with mothers and teachers. This study is one of the first to focus the interrelatedness among multiple development settings, where proximal experiences in afterschool programs is examined within a broader ecology of development.

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CHAPTER 1

Developmental Pathways linking the Quality and Intensity of Organized Afterschool Activities in Middle School to Academic Performance at End of High School

Organized afterschool activities are developmental contexts that have the potential to support adolescents' academic performance (Vandell, Larson, Mahoney, & Watts, 2015). However, studies of organized afterschool activities have been limited in several respects. They have often focused on the quantity of participation or the amount of time adolescents spend in activities and only rarely on the quality of adolescents' experiences in the activities although both aspects are likely important (Simpkins, 2015; Vandell et al., 2015). In addition, studies have considered activities during relatively brief developmental windows - middle school or high school - and have not examined activities across adolescence. As a result, it is unknown if both the quantity and quality of adolescents' participation in organized afterschool activities at the beginning of middle and in early high school are associated with academic performance at the end of high school. Finally, despite calls to understand the processes linking adolescents' activity participation to their subsequent academic performance (Roth & Brooks-Gunn, 2016; Simpkins, 2015), only limited empirical research has considered the potential pathways by which activities in middle school are linked to later academic performance (Haghighat & Knifsend, 2019). The current study seeks to address these limitations by examining both the quantity and quality of organized afterschool activities at the beginning of middle school (6^{th} grade) in relation to academic performance at the end of high school (i.e., 12^{th} grade) via two potential developmental pathways: adolescents' organized afterschool activities at Age 15 and their academic skills at Age 15, which is during their early high school years (i.e., 9^{th} & 10^{th} grades).

Participation Intensity and Quality of Experiences in Organized Afterschool Activities

Activity intensity refers to the amount of time an individual spends in organized afterschool activities during a particular timeframe (e.g., days per week or month; Bohnert, Fredricks, & Randall, 2010). Activity intensity is important because individuals need to invest sufficient time in activities to take advantage of the developmental benefits afforded by activities. For instance, it takes time to develop skills and interpersonal connections, and internalize prosocial norms that might help adolescents succeed academically (Bohnert et al., 2010; Busseri & Rose-Krasnor, 2009). Research on activity intensity has shown that more time spent in activities is often associated with better academic performance (for review, see Vandell et al., 2015), but there is variability among the findings. For example, Fredricks (2012) found that higher intensity in a range of activities in 10th grade was linked with higher grade point averages in 12th grade, although others found participation intensity in 9th and 10th grade was unrelated to adolescents' academic functioning in 12th grade (Busseri, Rose-Krasnor, Willoughby, & Chalmers, 2006). These contrasting findings may be the result of other unmeasured aspects of activity participation, including the quality of experiences in these activities.

Activity quality refers to the proximal processes that transpire as youth participate in organized afterschool activities. Studies that have focused on activity quality have highlighted youth's experiences with specific quality features that promote academic skills and performance. For example, researchers have found that positive youth-leader relationships are associated with gains in work habits, task persistence (Kataoka & Vandell, 2013), and academic grades (Pierce et al., 2010). Other work has highlighted positive peer interactions in activities as sources of support for adolescents' development of skills that are important for academic performance

(Larson & Brown, 2007; Salusky et al., 2014). Still other research has examined the extent to which organized afterschool activities promote skill development and a sense of enjoyment (Durlak, Weissberg, & Pachan, 2010; Shernoff, 2010). Existing studies have not, however, explicitly tested possible pathways by which quality of experiences in organized afterschool activities is linked to later academic performance.

Intermediate Activity Participation and Academic Skills as Developmental Pathways

Life-course theory has emphasized the cumulative nature of development and that earlier experiences and skills influence individuals' subsequent functioning (Elder et al., 2015), and bioecological theory has proposed two general pathways that may influence individuals' later functioning: subsequent contexts and individual skills (Bronfenbrenner & Morris, 2006). Recently, scholars have applied these theories to understanding the effects of youth's organized afterschool activities on later functioning, arguing that youth's participation in organized afterschool activities at one time point could influence their long-term functioning through two pathways: activity participation pathway and skill development pathway (Nelson, 2017; Vandell, Simpkins, & Liu, 2020). The first pathway, shown in the dashed lines in Figure 1.1, is an *activities pathway* in which middle school activities is linked to organized activities in early high school, which is then linked to academic performance at the end of high school. A second pathway, shown in the solid lines in Figure 1.1, is a *skills pathway* in which organized activities in middle school are linked to adolescent academic skills in early high school, which are then carried forward to the end of high school. In the text that follows, the rationale underlying these proposed pathways is presented.

Activity participation as a pathway. Proponents of organized afterschool activities have argued that these activities provide a "ladder of opportunities" in which participation at an earlier

time point prepares youth for future activity opportunities that continue to support positive development (Nelson, 2017). This activity pathway aligns with conceptualizations of "sustaining environments" in which program effects are more likely to be maintained when programming is sustained over time (Bailey, Duncan, Odgers, & Yu, 2017; Vandell, et al., 2020). In the case of organized afterschool activities, continued activity participation from middle to high school is expected to promote adaptive academic functioning as they provide sustained opportunities for adolescents to engage with developmentally positive experiences in organized afterschool activities. Paths a → d in Figure 1.1 are an example where 6th grade participation intensity promotes later participation at Age 15, which then predicts adolescents' academic performance at end of high school. There is some evidence consistent with this proposed pathway. For example, Simpkins and colleagues (2010) found that more time spent in sports and music activities in elementary school predicted more participation in middle school, and Denault and Poulin (2009) found small to moderate stability in intensity of activity participation from middle to high school. Parallel work does not exist for quality of experiences in organized afterschool activities and how continuity in participation might provide sustained support leading to better academic performance.

Intermediate academic skills as a pathway. According to bioecological theory, positive experiences in proximal contexts promote the development of skills and competences that then become *resources* and *assets* for later development (Bronfenbrenner & Morris, 2006). Scholars further posit processes related to developmental continuity (Schulenberg, Maggs, & O'Malley, 2003) and developmental cascades (Masten & Cicchetti, 2010). According to these perspectives, competence in one domain at an earlier time point scaffolds competence in the same domain (Schulenberg et al., 2003) and other related domains (Masten & Cicchetti, 2010) at subsequent

time points. Previous research has suggested that two of the strongest individual-level predictors of academic performance in high school are adolescents' prior academic competence (Casillas et al., 2012) and social-emotional skills such as positive work orientation (Simpkins, Tulagan, Lee, Ma, Zarrett, & Vandell, 2020). Therefore, prior academic excellence and positive work orientation could function as pathways linking organized afterschool activity participation to later academic performance as shown, for example, in paths b → e and paths c → f in Figure 1.1.

Organized afterschool activities present many opportunities for the development of academic excellence and positive work orientation. Participating in these activities may limit the amount of unsupervised time with peers while providing enrichment activities that could directly benefit academic performance (Vandell et al., 2015). In addition, adolescents often engage in goal-directed work in these activities, where they learn about obligations, and persistence – positive work orientations that help them develop into devoted learners and competent individuals. Studies that focus on quality of experiences in organized afterschool activities find that the proximal processes such as leader and peer interactions are related to adolescents' academic competence (Hirsch, 2005) and positive work orientation (Kataoka & Vandell, 2013; Larson & Angus, 2011; Salusky et al., 2014; Shubert, Wray-Lake, & McKay, 2020). Despite these associations, studies have not simultaneously examined academic competence and positive work orientation as possible developmental pathways linking organized afterschool activities to subsequent academic performance.

Current Study

The goal of the current study is to test two potential developmental pathways by which organized afterschool activities at the beginning of middle school (i.e., 6th grade) are linked to academic performance at the end of high school (i.e., 12th grade): adolescents' organized

afterschool activities in early high school (i.e., Age 15) and adolescents' academic achievement and work orientation in early high school (i.e., Age 15). Based on bioecological theory and propositions on "sustaining environments" (Bronfenbrenner & Morris, 2006; Vandell et al., 2020), it is expected that activity participation in 6th grade would lay the foundation for activity participation at Age 15, which would help maintain academic excellence to end of high school (i.e., 12th grade). In addition, 6th grade participation is hypothesized to promote important academic skills including academic achievement and positive work orientation at Age 15, which would then become developmental assets for their academic performance in 12th grade.

Issues of self-selection are a significant concern in research on organized afterschool activities. For example, adolescents who attend activities more regularly or have more positive experiences at the activities may differ a priori from other youth and these differences may account for variations in academic performance (Mahoney et al., 2009; Vandell et al., 2015). To reduce potential selection bias, we controlled for adolescents' 5th grade academic achievement and work habits in predicting their Age 15 academic achievement and work orientation. In addition, we also took into account adolescent gender, ethnicity, and family characteristics (i.e., maternal education, income to needs ratio, epoch of single parent household, and observed quality of the home environment).

Method

Participants

The NICHD Study of Early Child Care and Youth Development (SECCYD) is a birth cohort of 1,364 children (52% male) and their families from 10 locations in the United States. Participating children and families were assessed on a wide array of contextual and developmental measures at regular intervals from birth through the end of high school. For a full

discussion of the NICHD SECCYD sampling design, see NICHD Early Child Care Research Network (2005).

As the focus of the current study was to examine the associations between organized afterschool activities in 6th grade with academic performance in 12th grade, only adolescents who provided reports of their organized afterschool activities (including reports of 0 activities) were included in the analysis (N = 1,038). Descriptive statistics for the organized afterschool activity sample are presented in Table 1.1. The analysis sample was not significantly different from the recruitment sample on individual and family characteristics, with two exceptions. Mothers of adolescents in the analysis sample had higher levels of education compared to mothers in the recruitment sample (t [1361] = 5.26, $p < .001$, Cohen's d = .33). Adolescents in the recruitment sample, however, had higher HOME score than adolescents in the analysis sample (t [1067] = 4.35, $p < .001$, Cohen's d = .59).

Measures

Organized afterschool activities. In 6th grade and at Age 15, adolescents reported the number of days in a typical week (0 = *no participation*; 1 = *1 day a week*; 7 = *7 days a week*) during the fall semester that they participated in each of five types of organized afterschool activities: sports (e.g., football), arts (e.g., arts and crafts), academic clubs (e.g., math/science club), nonacademic clubs (e.g., student government), and/or religious activities (e.g., Bible study). At Age 15, adolescents also reported on their participation in volunteer activities. From these reports, we created an overall intensity score at each age period by summing the reports of participation across activities.

Adolescents also reported the quality of their experiences in each activity by responding to four questions: (a) is the coach or leader of this activity someone you can trust, that listens to

you and cares about you, and thinks that you are important? (b) how well do you get along with other kids in activity? (c) does the coach or leader help you learn new skills or things you didn't know about before? and (d) how much do you like doing the activity? These questions were scored on a 4-point scale (0 = *not at all*, 3 = *very much*). If an adolescent did more than one activity within a specific type (e.g., two sport activities), they were asked about their favorite activity. Parallel to participation intensity, we created an overall score of quality of experiences by taking the mean of all items across all types of activities at each time point (α = .70 and .74 for 6th grade and Age 15 respectively).

Academic achievement. At Age 15, *academic achievement* was measured with three subsets of the Woodcock-Johnson Psycho-Educational Battery-Revised (WJ-R): applied problems, passage comprehension, and picture vocabulary. The tests took place in a university lab and lasted between 5 to 10 minutes each. The standardized scores were used in the present study (national $M = 100$, $SD = 15$). Following prior procedures (Vandell et al., 2010), we used all three tests as indicators of a latent variable of adolescent academic achievement at Age 15.

Work orientation. Adolescents' self-reported *work orientation* at Age 15 was based on items from the Psychosocial Maturity Inventory (PSMI Form D; Greenberger, 2001). The work orientation scale measured positive attitudes towards work, perseverance, and successful completion of tasks (10 items; e.g., "I seldom get behind on my work"; 1 = *strongly disagree*, 4 = *strongly agree*; α = .78). A composite score was created for work orientation by taking the mean of all items on the scale, with higher scores indicating more positive work orientation. Reflected items were reverse coded before being used to create composite scores.

Academic performance. In 12th grade, adolescents reported the *typical school grades* they received in high school (1 = *mostly below Ds*, 8 = *mostly As*). Adolescents also reported the

number of advanced classes taken in honors classes and advanced placement (AP) classes scored on a 0-3 scale: 0 = *no classes*, 1 = *one class*, 2 = *two to three classes*, 3 = *four or more*. Their responses for honors and AP classes were summed to create a variable called *advanced classes*, which ranged from 0 to 6. Both measures of academic performance have been used in previous publications using the NICHD SECCYD dataset and are related to earlier academic achievement and work habits (Simpkins et al., 2020; Vandell et al., 2016).

Covariates. We controlled for individual and family characteristics that may be related to participation in organized afterschool activities and adolescents' academic functioning (Vandell et al., 2015). First, we controlled for adolescents' prior functioning including 5th grade academic achievement measured by the Woodcock-Johnson Psycho-Educational Battery-Revised (WJ-R) (α = .85; Woodcock & Johnson, 1989), as well as work habits reported by 5th grade classroom teachers (6 items; α = .95; Pierce, Hamm, & Vandell, 1999). We also took into account adolescent gender (Male = 0), and ethnicity (White = 0), number of years of maternal education, average income to needs ratio from 1st to 5th grade, average percent of time living in a single-parent household from 1st to 5th grade, and observed quality of the home environment across 3rd and 5th grade measured using the HOME scale (Bradley, Caldwell, & Rock, 1988).

Missing Data Analyses

Among the 1,038 adolescents included in the analysis sample, 773 (74%) had at least one indicator of adolescents' 12th grade academic performance. Compared to those missing 12th grade data, participants with available data in 12th grade were more likely to be female (X^2[1] = 4.43, p = .04) and White (X^2 [1] = 24.91, p < .001), came from families with higher maternal education (t [1036] = 6.66, p < .001, Cohen's d = .48), higher income-to-needs ratio (t [1026] = 4.41, p < .001, Cohen's d = .32), higher observed quality of the home environment in middle

childhood (t [1015] = 8.43, $p < .001$, Cohen's $d = .58$), and were less likely to come from single-parenthood families (t [1032] = -5.16, $p < .001$, Cohen's $d = .35$). To account for the missing data, we used full information maximum likelihood in our analyses. All control variables were included in models to help estimate missing data (Enders, 2010).

Plan of Analysis

The primary goal of the current investigation was to explore two pathways (an organized afterschool activity pathway and an academic skills pathway) linking 6th grade organized afterschool activities (i.e., intensity and quality of experiences) with 12th grade academic performance. Structural equation models (SEMs) were estimated in M*plus* 8 to simultaneously examine the two pathways (Muthen & Muthen, 2017). As illustrated in Figure 1.1, indirect effects (or pathways) were estimated as the product terms between two direct paths (e.g., *a*d*, *b*e*, and *c*f* in Figure 1.1; Hayes & Preacher, 2010) using the MODEL INDIRECT command. The direct associations between 6th grade activity participation and 12th grade academic performance were also estimated by the paths going directly from one variable to the other (e.g., paths *g* and *h* in Figure 1.1). The covariances among indicators measured at the same time point were estimated. For instance, organized afterschool activity indicators, academic achievement, and work orientation at Age 15 were all allowed to covary. We used a range of model-fit indices including CFI/TLI, RMSEA, and SRMR. CFI/TLI need to be above .90, RMSEA needs to below .05, and SRMR needs to below .08 to indicate acceptable model fit (Hu & Bentler, 1999).

Results

Descriptive Statistics

Bivariate correlations indicated that adolescents who spent *more days* in organized afterschool activities in 6th grade reported taking more advanced classes ($r = .11$, $p < .01$) in 12th

grade (Table 1.2). Adolescents who reported higher quality experiences in organized afterschool activities in 6th grade reported higher grades (r =.16, p < .001) and more advanced classes (r = .08, p < .05) in 12th grade. In addition, higher intensity of activities and more positive experiences in activities in 6th grade were related to higher participation intensity (r's = .25 and .16, p < .01), higher quality (r's = .09 & .24, p < .01), and stronger work orientations in early high school at Age 15 (r's = .10 & .18, p < .01). Activity participation, academic achievement, as well as work orientation at Age 15, were all positively associated with academic performance in 12th grade (r's = .11 - .53, p < .05). Correlational statistics among all key variables and covariates are provided in Appendix Table 1.2.

Organized Afterschool Activities and Academic Skills at Age 15 as Pathways Linking 6th Grade Organized Afterschool Activities and 12th Grade Academic Performance

Next, we used SEM analyses to test two developmental pathways linking organized afterschool activity participation (i.e., intensity and quality of experiences) in 6th grade and adolescents' academic performance in 12th grade, after controlling for the individual and family covariates. The overall SEM model presented good fit to the data according to various model fit indices, $\chi 2$ (138) = 365.737, p < .001, CFI/TLI = .959/.914, RMSEA = .040 (90% CI = .035-.045), SRMR = .021. As shown in Figure 1.2, findings from our analyses, in general, provided support for the two pathways linking organized afterschool activity participation in 6th grade to academic performance in 12th grade. Results for all estimated paths including covariates are presented in Appendix Table 1.3.

Organized Afterschool Activities at Age 15 as a Pathway. With regard to an organized afterschool activity pathway, SEM results indicated that adolescents who spent more days and reported more positive experiences in organized afterschool activities in 6th grade reported more

time (ß's = .215 & .111, *SE*'s = .031 & .032, *p's* < .01), as well as more positive experiences in organized activities at Age 15 (ß's = .070 & .248, *SE*'s = .033 & .034, *p's* < .05). Participation intensity at Age 15, in turn, was related to higher typical grades (ß = .102, *SE* = .033, *p* = .002) and taking more advanced classes in 12th grade (ß = .110, *SE* = .032, *p* = .001). Higher quality of experiences in organized afterschool activities at Age 15 was also related to higher typical grades in 12th grade (ß = .098, *SE* = .034, *p* = .004). These relations between Age 15 activity participation and 12th grade academic performance were evident even controlling for academic achievement at Age 15.

Activity intensity and quality of experiences at Age 15 thus linked 6th grade activity participation to 12th grade academic performance (Table 1.3). Five of the eight indirect pathways were statistically significant: 6th grade intensity → Age 15 intensity → 12th grade typical grades and the number of advanced classes (ß's = .022 & .024, *SE*'s = .008, *p's* < .01); 6th grade quality of experiences → Age 15 intensity → 12th grade typical grades and the number of advanced classes (ß's = .011 & .012, *SE*'s = .005, *p's* < .05); and 6th grade quality of experiences → Age 15 quality of experiences → 12th grade typical grades (ß = .024, *SE* = .009, *p* = .008).

Academic Skills at Age 15 as a Pathway. Adolescents' participation intensity in 6th grade was associated with higher academic achievement at Age 15 (ß = .044, *SE* = .020, *p* = .025) even after controlling for 5th grade academic achievement. Age 15 academic achievement, in turn, was positively associated with typical grades (ß = .392, *SE* = .038, *p* < .001) and the number of advanced classes in 12th grade (ß = .558, *SE* = .031, *p* < .001). The two indirect pathways through academic achievement were statistically significant (Table 1.3): 6th grade intensity → Age 15 academic achievement → 12th grade typical grades and the number of advanced classes (ß's = .017 &.025, *SE*'s= .008 & .011, *p's* = .028 & .026).

Adolescents' reported quality of experiences in 6th grade organized afterschool activities was associated with more positive work orientation at Age 15 even after controlling for 5th grade work habits (ß = .152, *SE* = .033, $p < .001$). More positive work orientation at Age 15, in turn, was linked to higher grades (ß = .165, *SE* = .032, $p < .001$) and more advanced classes in 12th grade (ß = .090, *SE* = .032, $p = .004$). The two indirect pathways through work orientation were statistically significant (Table 1.3): 6th grade quality of experiences → Age 15 work orientation → 12th grade typical grades and the number of advanced classes (ß's = .025 & .014, *SE's*= .007 & .006, *p's*= .001 & .016).

Discussion

Previous research has documented positive relations between adolescents' organized afterschool activities and academic performance (e.g., Fredricks & Eccles, 2006; Haghighat & Knifsend, 2019). However, existing studies focus more on the amount of time spent in activities, with much less attention on the quality of activity experiences. In addition, little research examines time points spanning the adolescent period and the mechanisms linking both participation intensity and quality of experiences in activities to later academic performance. The findings of the current study address these gaps in the literature by demonstrating that both the quantity (i.e., participation intensity) and quality of experiences in organized afterschool activities at the beginning of middle school (i.e., 6th grade) was related adolescents' academic performance at end of high school (i.e., 12th grade) through two pathways: organized afterschool activity participation and academic skills at Age 15.

Activity Participation and Intermediate Academic Skills as Pathways

Consistent with previous research examining organized afterschool activity participation over time (Denault & Poulin, 2009; Simpkins et al., 2010), we found evidence that adolescents

who participated in organized afterschool activities for more days and those who reported higher quality activity experiences in 6th grade tended to participate in organized afterschool activities for more days and report more positive experiences at Age 15. In addition, activity participation at Age 15 formed an indirect pathway linking 6th grade activity participation to academic performance in 12th grade. Our findings are consistent with scholars' propositions on "sustaining environments" (Vandell et al., 2020) in which academic benefits of activity participation at the beginning of middle school are sustained by adolescents' continued participation in activities in early high school. While fade-out is an issue of concern in educational interventions (Bailey et al., 2017), findings from the current study suggest that the academic benefits of participating in organized afterschool activities can be maintained through adolescents' continued participation in these positive settings over time. The current findings also have practical implications for both adolescents and their families. Participation in organized afterschool activities is not just about finding a safe place to spend time, they prepare adolescents for new contextual opportunities of development. These experiences may be particularly important during certain developmental periods, such as early adolescence, when individuals are increasingly exploring their world, building skills, and figuring out their interests and identities.

In addition to an activity pathway, we also detected an individual-level pathway linking earlier activity participation to subsequent academic performance. Here, findings suggest that organized afterschool activities promote adolescents' academic competence and positive work orientation, which are then carried forward. These findings are consistent with the propositions on developmental continuity (Schulenberg et al., 2003) such that earlier academic excellence lays the foundation for academic performance at later time points. In addition, the positive work orientation pathway indicates developmental cascades effects (Masten & Cicchetti, 2010) as

earlier activity participation promotes a positive work orientation, which then leads to development in a distinct yet related domain (i.e., academic performance) at subsequent time points. As accumulating research suggests that adolescent participation in organized afterschool activities is related to individual functioning up to early adulthood (Gardner et al., 2008; Viau et al., 2015), findings from the current study provide a direction of detecting developmental pathways underlying such associations. It is likely that long-term developmental benefits are mediated by intermediate developmental gains in adolescence.

These findings provide important insights into the positive role of organized afterschool activities in facilitating academic performance across developmental transitions during adolescence. The transitions from elementary to middle school and from middle to high school have been found to pose risks to adolescents' academic performance (Eccles & Roeser, 2009), as individuals experience great change in their social contexts above and beyond normal developmental changes. Findings from the current study suggest that adolescents who are involved in organized afterschool activities during 6th grade can garner academic benefits, contributing to a smoother transition. Compared with school settings, organized afterschool activities typically have more flexible structures and opportunities for more meaningful interpersonal interactions and engaged learning. High quality experiences in organized afterschool activities may better meet adolescents' need for competence, autonomy, and sense of relatedness, all of which contribute to better academic functioning (Deci & Ryan, 2012). In a previous study examining organized afterschool activity participation among middle and high school students, researchers also find that activity participation helps adolescents form new friendships (Schaefer, Simpkins, Vest, & Price, 2011). Together with previous research, the

current investigation suggests that middle and high school should make organized afterschool activities more accessible to students during the transitional years.

Quantity and Quality of Participation

Another contribution of the current study is that we examined both the quantity (i.e., intensity) and quality of adolescents' experiences in organized afterschool activities. The findings suggest that both quantity and quality of adolescents' participation are associated with their academic performance. Spending more time in organized afterschool activities not only was directly related to academic performance, but also may help prepare adolescents for continued activity participation, which in turn was related to academic gains. Findings from the current study also highlight the additional role that proximal processes such as relationships with adult leaders and peers in organized afterschool activities play in adolescents' development (Roth & Brooks-Gunn, 2016; Vandell et al., 2015). High quality experiences are not only important in engaging and keeping adolescents involved in activities, they also facilitate the acquisition of important academic skills, such as work orientation, which can bolster adolescents' subsequent academic performance.

Limitations and Future Directions

Although the current study has a number of strengths (a large sample, longitudinal measures of activity participation), the SECCYD is correlational, not experimental. Although we have controlled for multiple individual- and family-level factors, we cannot rule out the possibility that selection factors or omitted variables may account for observed associations between activity participation and academic functioning. We therefore caution against drawing causal conclusions from the current findings. A second limitation is that we measured activity intensity and quality during the fall semester of 6th grade and Age 15. Future research is needed

to examine activity participation more intensively over time. For example, researchers can take advantage of other measurement methods such as time diary or experience sampling at multiple time points throughout the year to better capture activity experiences (Bohnert et al., 2010).

Conclusion

Findings from the current study indicate that both quantity and quality of organized afterschool activities are related to adolescents' academic performance. Although research has only rarely examined the quality of experiences in organized afterschool activity settings, findings from the current study suggest that adolescents' reports of the quality of their experiences in these activities in middle school are linked to activity participation in early high school as well as longitudinal academic performance. Therefore, beyond their focus on ensuring attendance and retention, organized afterschool activities also need to be mindful of the quality of adolescents' experiences in those activities. In addition, the current study extends our understanding of developmental pathways by which organized afterschool activities are linked with longitudinal academic performance. Participation in organized afterschool activities in early middle school prepares individuals for an activity pipeline and helps promotes key academic skills that extend longitudinal academic benefits to end of high school.

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Table 1.1
Descriptive Statistics for Analysis and Recruitment Samples

	Analysis sample[1]		Recruitment sample		Significant difference between analysis and recruitment samples	
	M(%)	*SD*	M(%)	*SD*	*p*	Cramér's *V*[a]/ Cohen's *d*[b]
N	1038		1364			
Female	50%		48%		.07	.05[a]
White	77%		76%		.37	.02[a]
Maternal education	14.43	2.45	14.23	2.51	.00	.33[b]
Income-to-needs ratio 1st-5th grade	4.27	3.50	4.26	3.46	.57	.07[b]
Single-parent epochs (proportion) 1st-5th grade	.20	.34	.19	.34	.15	.16[b]
HOME[2] score 3rd-5th grade	41.28	5.66	41.45	5.73	.00	.59[b]
Academic achievement 5th grade	106.01	11.41	105.93	11.62	.09	.30[b]
Work habits 5th grade	3.70	1.04	3.70	1.04	.62	.10[b]

Note. [1]Analysis sample included adolescents reporting at least one activity participation variable in 6th grade and Age 15.
[2]Home Observation for Measurement of the Environment (HOME) Inventory.
[a]Cramér's *V*: .10 small effect size, .30 moderate effect size, and .50 large effect size.
[b]Cohen's *d*: .20 small effect size, .50 moderate effect size, and .80 large effect size.

Table 1.2

Descriptives and Bivariate Correlation among Organized Afterschool Activity and Academic Performance

	1	2	3	4	5	6	7	8	9	10
Organized afterschool activity in 6th grade										
1. Intensity (days/wk)	-									
2. Quality of experiences	.10**	-								
Organized afterschool activity and academic skills at Age 15										
3. Intensity (days/wk)	.25***	.16***	-							
4. Quality of experiences	.09**	.24***	.21***	-						
5. Picture vocabulary[a]	-.03	-.00	.04	-.01	-					
6. Passage comprehension[a]	-.00	.05	.07	.02	.69***	-				
7. Applied problems[a]	.06	.01	.01	.05	.58***	.67***	-			
8. Work orientation	.10**	.18***	.22***	.27***	.11**	.13***	.15***	-		
Academic performance in 12th grade										
9. Typical grades	.06	.16***	.21***	.20***	.31***	.38***	.39***	.32***	-	
10. Number of advanced classes	.11**	.08*	.20***	.11**	.41***	.51***	.53***	.24***	.51***	-
Mean	4.77	2.55	8.02	2.45	99.93	107.71	102.92	3.01	6.41	2.64
SD	3.70	.41	4.68	.44	14.77	15.72	14.22	.50	1.47	2.17

Note. [a]Academic achievement at Age 15 is a latent variable estimated by picture vocabulary, passage comprehension, and applied problems.
*$p < .05$. **$p < .01$. ***$p <. 001$.

Table 1.3

Pathways Linking 6th Grade Organized Afterschool Activity Participation to 12th Grade Academic Performance

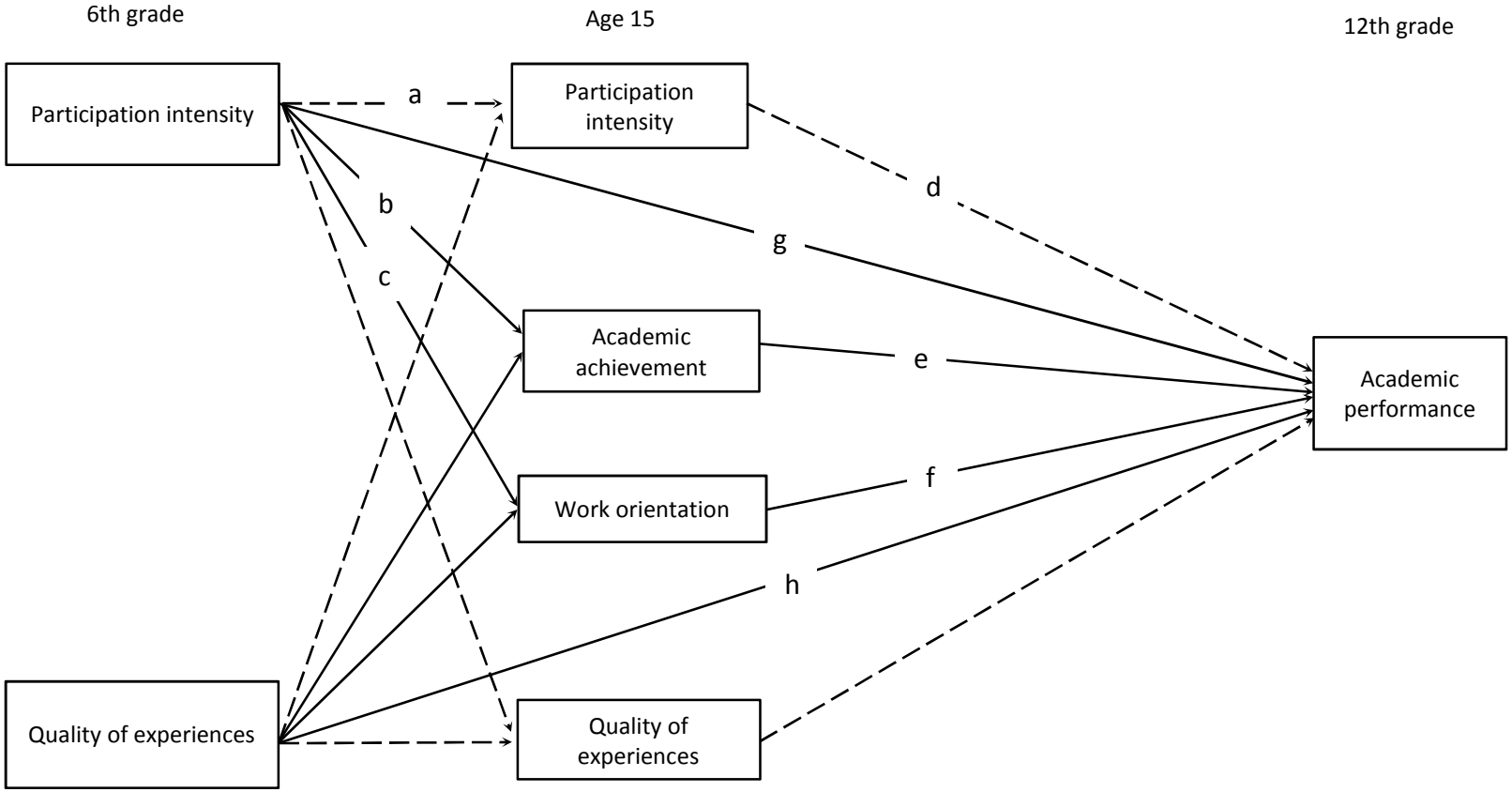
	Typical grades		Number of advanced classes	
	ß	*S.E.*	ß	*S.E.*
6th grade activity intensity via Age 15				
Intensity	.022**	.008	.024**	.008
Quality of experiences	.007	.004	.003	.003
Academic achievement	.017*	.008	.025*	.011
Work orientation	.010	.006	.006	.004
6th grade quality of experiences via Age 15				
Intensity	.011*	.005	.012*	.005
Quality of experiences	.024**	.009	.010	.008
Academic achievement	.004	.008	.006	.011
Work orientation	.025**	.007	.014*	.006

Note. Covariates include 5th grade academic achievement and work habits, adolescent gender (Male=0), ethnicity (White = 0), maternal education, income to needs ratio (1st-5th grade), epoch of single parent household (1st-5th grade), HOME score averaged across 3rd and 5th grades. Dummy variables for 10 data collection sites were entered to control for site-fixed effect.

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

Figure 1.1

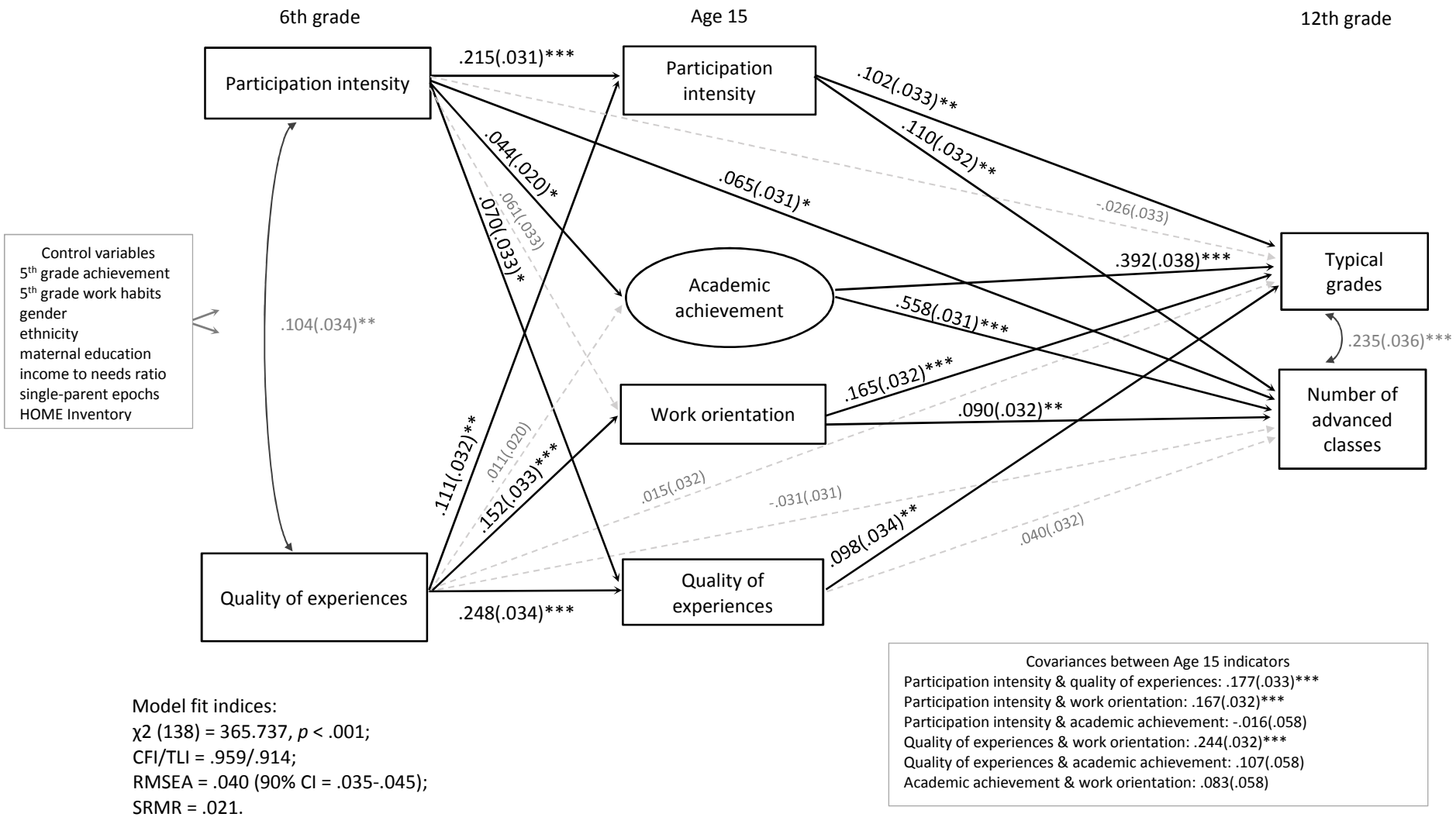
Conceptual Model of the Pathways Linking Organized Afterschool Activity Participation in 6th Grade to Academic Performance in 12th Grade



Note. Dashed lines indicate activity pathways; solid lines indicate academic skills pathways.
Covariances between variables measured at the same time point were also estimated.
Covariates include 5th grade academic achievement and work habits, adolescent gender (Male=0), ethnicity (White = 0), maternal education, income to needs ratio (1st-5th Grade), epoch of single parent household (1st-5th Grade), Home Observation for Measurement of the Environment (HOME) Inventory averaged across 3rd and 5th grades. Dummy variables for 10 data collection sites were entered to control for site-fixed effect.

Figure 1.2

Pathways Linking Organized Afterschool Activity Participation in 6th Grade to Academic Performance in 12th Grade



Model fit indices:
χ2 (138) = 365.737, $p < .001$;
CFI/TLI = .959/.914;
RMSEA = .040 (90% CI = .035-.045);
SRMR = .021.

Note. Academic achievement at Age 15 is a latent variable estimated by picture vocabulary, passage comprehension, and applied problems. Covariates include 5th grade academic achievement and work habits, adolescent gender (Male=0), ethnicity (White = 0), maternal education, income to needs ratio (1st-5th Grade), epoch of single parent household (1st-5th Grade), Home Observation for Measurement of the Environment (HOME) Inventory averaged across 3rd and 5th grades. Dummy variables for 10 data collection sites were entered to control for site-fixed effect.

Appendix Table 1.1

Scale Information for Measures Used in the Current Study

Participation intensity (0 = *no participation*; 1 = *1 day a week*; 7 = *7 days a week*)

When you were in *Activity*, how many days did you take part in them during a typical week?

Quality of experiences (0 = *not at all*, 1 = *only a little*, 2 = *somewhat*, 3 = *very much*)

1. Is the coach or leader of this sport someone you can trust, that listens to you and cares about you, and thinks that you are important?
2. How well did you get along with other kids in activity?
3. Does the coach or leader help you learn new skills or things you didn't know about before?
4. How much did you like doing the activity?

Academic achievement at Age 15

Woodcock-Johnson Psycho-Educational Battery-Revised (copy righted scale)

Work orientation (1 = *strongly disagree*, 4 = *strongly agree*; all items were reverse coded besides item 6)

1. Hard work is never fun.
2. If something more interesting comes along, I will usually stop any work I'm doing.
3. I find it hard to stick to anything that takes a long time to do.
4. I hate to admit it, but I give up on my work when things go wrong.
5. I often don't get my most important work done because I've spent too much time on other work.
6. I seldom get behind on my work.
7. I tend to go from one thing to another before finishing any one of them.
8. I often don't finish work that I start.
9. I often leave my homework unfinished if there are a lot of good TV shows on that evening.
10. No one should expect you to do work that you don't like.

Academic performance in 12^{th} grade

1. What are/were your grades like in school? (1 = *mostly below Ds*, 8 = *mostly As*)
2. How many honors classes have you taken? (0 = *no classes*, 1 = *one class*, 2 = *two to three classes*, 3 = *four or more*)
3. How many advanced placement classes have you taken? (0 = *no classes*, 1 = *one class*, 2 = *two to three classes*, 3 = *four or more*)

Appendix Table 1.2

Correlation between Organized Afterschool Activity, Academic Performance, and Covariates

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Organized afterschool activity in 6th grade																				
1. Intensity (days/wk)	-																			
2. Quality of experiences	.10[b]	-																		
Organized afterschool activity and academic skills at Age 15																				
3. Intensity (days/wk)	.25[c]	.16[c]	-																	
4. Quality of experiences	.09[b]	.24[c]	.21[c]	-																
5. Picture vocabulary	-.03	-.00	.04	-.01	-															
6. Passage comprehension	-.00	.05	.07	.02	.69[c]	-														
7. Applied problems	.06	.01	.01	.05	.58[c]	.67[c]	-													
8. Work orientation	.10[b]	.18[c]	.22[c]	.27[c]	.11[b]	.13[c]	.15[c]	-												
Academic performance in 12th grade																				
9. Typical grades	.06	.16[c]	.21[c]	.20[c]	.31[c]	.38[c]	.39[c]	.32[c]	-											
10. Number of advanced class	.11[b]	.08[a]	.20[c]	.11[b]	.41[c]	.51[c]	.53[c]	.24[c]	.51[c]	-										
Covariates																				
11. Picture vocabulary (5th grade)	-.04	.01	.06	-.03	.81[c]	.66[c]	.51[c]	.10[b]	.26[c]	.37[c]	-									
12. Passage comprehension (5th grade)	-.04	.06	.06	-.00	.63[c]	.67[c]	.54[c]	.13[c]	.33[c]	.43[c]	.63[c]	-								
13. Applied problems (5th grade)	.00	.05	.06	.00	.53[c]	.61[c]	.73[c]	.12[c]	.37[c]	.46[c]	.55[c]	.60[c]	-							
14. Work habits (5th grade)	.06	.08[a]	.15[c]	.02	.23[c]	.34[c]	.36[c]	.19[c]	.44[c]	.42[c]	.23[c]	.34[c]	.36[c]	-						
15. Female (Male=0)	.05	.11[c]	.10[b]	.04	-.11[b]	.04	-.09[b]	.04	.20[c]	.07	-.04	.06	-.03	.30[c]	-					
16. Ethnicity (White=0)	.06	-.04	.02	-.07[a]	-.31[c]	-.30[c]	-.23[c]	-.10[b]	-.22[c]	-.17[c]	-.29[c]	-.25[c]	-.28[c]	-.24[c]	-.02	-				
17. Maternal education	.06	.01	.13[c]	.01	.42[c]	.40[c]	.39[c]	.18[c]	.36[c]	.38[c]	.41[c]	.37[c]	.37[c]	.30[c]	.04	-.24[c]	-			
18. Income to needs ratio (1st-5th grade)	.03	.02	.07[a]	.02	.31[c]	.31[c]	.31[c]	.15[c]	.28[c]	.33[c]	.29[c]	.29[c]	.33[c]	.28[c]	.04	-.23[c]	.53[c]	-		
19. Single-parent epochs (1st-5th grade)	.03	-.09[b]	-.08[a]	-.01	-.20[c]	-.20[c]	-.20[c]	-.11[c]	-.21[c]	-.20[c]	-.16[c]	-.17[c]	-.20[c]	-.22[c]	.02	.30[c]	-.22[c]	-.29[c]	-	
20. HOME score (3rd-5th grade)	.04	.10[b]	.16[c]	.05	.37[c]	.38[c]	.37[c]	.14[c]	.32[c]	.32[c]	.38[c]	.35[c]	.40[c]	.37[c]	.02	-.38[c]	.49[c]	.43[c]	-.45[c]	-

Note. Academic achievement at Age 15 and 5th grades are latent variables estimated by picture vocabulary, passage comprehension, and applied problems.

[a]$p < .05$. [b]$p < .01$. [c]$p <. 001$.

Appendix Table 1.3

Coefficients of All Estimated Paths in SEM Model for Relations between 6th Grade Organized Afterschool Activity Participation and 12th Grade Academic Performance

	Organized afterschool activity in 6th grade				Organized afterschool activity and academic skills at Age 15								Academic performance in 12th grade			
	Intensity		Quality of experiences		Intensity		Quality of experiences		Academic achievement		Work orientation		Typical grades		Number of advanced classes	
	ß(S.E.)	*p*	ß(S.E.)	*p*	ß(S.E.)	*p*	ß(S.E.)	*p*	ß(S.E.)	*p*	ß(S.E.)	*p*	ß(S.E.)	*p*	ß(S.E.)	*p*
Organized afterschool activity in 6th grade																
Intensity (days/wk)	-	-	-	-	.215(.031)	.000	.070(.033)	.034	.044(.020)	.025	.061(.033)	.061	-.026(.033)	.416	.065(.031)	.037
Quality of experiences	-	-	-	-	.111(.032)	.001	.248(.034)	.000	.011(.020)	.566	.152(.033)	.000	.015(.032)	.648	-.031(.031)	.311
Organized afterschool activity and academic skills at Age 15																
Intensity (days/wk)	-	-	-	-	-	-	-	-	-	-	-	-	.102(.033)	.002	.110(.032)	.001
Quality of experiences	-	-	-	-	-	-	-	-	-	-	-	-	.098(.034)	.004	.040(.032)	.207
Academic achievement	-	-	-	-	-	-	-	-	-	-	-	-	.392(.038)	.000	.558(.031)	.000
Work orientation	-	-	-	-	-	-	-	-	-	-	-	-	.165(.032)	.000	.090(.032)	.004
Covariates																
Academic achievement (5th grade)	-.133(.049)	.006	.000(.046)	.996	-.002(.046)	.962	-.024(.041)	.562	.877(.021)	.000	.025(.044)	.576	-	-	-	-
Work habits (5th grade)	.090(.037)	.016	.013(.042)	.765	.087(.037)	.020	-.008(.037)	.836	.049(.024)	.042	.126(.037)	.001	-	-	-	-
Female (Male=0)	-	-	.111(.034)	.001	-	-	-	-	-.066(.020)	.001	-	-	.192(.029)	.000	.089(.029)	.002
Ethnicity (White=0)	.077(.035)	.026	-	-	.094(.033)	.004	-.066(.033)	.048	-	-	-	-	-	-	-	-
Maternal education	.092(.039)	.019	-	-	.071(.037)	.054	-	-	.063(.023)	.005	.086(.039)	.027	.101(.035)	.004	-	-
Income to needs ratio (1st-5th grade)	-	-	-	-	-	-	-	-	-	-	.066(.037)	.073	-	-	.080(.031)	.010
Single-parent epochs (1st-5th grade)	-	-	-.067(.037)	.071	-	-	-	-	-	-	-	-	-.088(.032)	.006	-.059(.031)	.056
HOME score (3rd-5th grade)	.061(.040)	.130	.076(.043)	.079	.115(.038)	.003	-	-	-	-	-	-	-	-	-	-

Note. Academic achievement at Age 15 and 5th grades are latent variables estimated by picture vocabulary, passage comprehension, and applied problems. Dummy variables for 10 data collection sites were entered to control for site-fixed effect.

CHAPTER 2

Duration and Enjoyment of Adolescent Organized Activities as Predictors of Leisure Time Activities in Adulthood

The way adults spend their leisure time has important implications for their physical, social, and psychological wellbeing (Caldwell, 2005). Wellbeing promotive leisure time activities include physical and cultural activities (Stuckey & Nobel, 2010; Wang, Li, Zhang, & Rehkopf, 2021), as well as socially beneficial or spiritually enriching activities such as volunteering (Ballard, Hoyt, & Pachucki, 2019) and/or religious attendance (Childs, 2010; Whooley, Boyd, Gardin, & Williams, 2002). Despite the well-known benefits of participating in those activities, it is less known why some adults are more involved than others. Emerging research suggests that participation in organized activities during adolescence helps prepare individuals for related leisure time activities in adulthood (Bélanger et al., 2015; Metzger, Ferris, & Oosterhoff, 2018; Perkins, Jacobs, & Eccles, 2004). However, little research explores specific features of adolescent activities that are associated with leisure time activities in adulthood (Zarrett, Liu, Vandell, & Simpkins, 2020). In addition, it is yet known if earlier activity participation only prepares individuals' later participation in the same type of activity or if these experiences promote an active life style and broader activity participation such that individuals also engage in other types of activities.

The purpose of the current investigation is to examine the association between organized activities in adolescence (i.e., 6th grade, age 15, and 12th grade) and leisure time activities in adulthood. Specifically, we examined the duration and quality of experiences in four types of common adolescent organized activities (i.e., sport, art, volunteer/community services, and religious youth groups) as well as their associations with individuals' leisure time activities at

age 26. In addition, we examined both with-in and cross-type associations in order to explore whether associations are constrained to the same type of activity.

Adolescent Organized Activity Participation and Leisure Time Activities in Adulthood

According to bioecological theory and life course theory, individuals' earlier experiences in developmental contexts have important implications for behaviors and choices later in life (Bronfenbrenner & Morris, 2006; Elder et al., 2015). Specifically, earlier experiences in an activity help individuals develop knowledge and skills which become resources for their future development. In the case of organized afterschool activities, earlier activity participation helps individuals learn and refine skills in a particular area, and build their motivational beliefs (e.g., interest) – both of which are instrumental for future participation in related activities (Côté, Baker, & Abernethy, 2007; Hidi & Renninger, 2006; Simpkins, Vest, & Becnel, 2009). Activity participation in adolesce might be particularly relevant for adult leisure time activity choice, as adolescence is a time when individuals establish lifelong practices and beliefs (Johnson, Crosnoe, & Elder, 2011). In addition, adolescent activities may better represent their interest, as compared with children, adolescents have more control over their activity participation. In addition, adolescence is an important period for identity development. Activity participation during this developmental period provide various opportunities for identity exploration (Barber, Stone, Hunt, & Eccles, 2005; Hansen, Larson, & Dworkin, 2003), which might influence their choice of future leisure time activities.

An alternative view, consistent with Arnett's theory of emerging adulthood, is that adolescents' organized activities may be only minimally related to leisure time activities in adulthood. According to Arnett (2014), the life period from age 18 to 29 is characterized by great changes in individuals' occupation, living status, and work situation, all of which could result in

instability and discontinuities in activity participation. As developmental theories suggest both continuity (Bronfenbrenner & Morris, 2006; Elder et al., 2015) and change (Arnett, 2014), it is important to empirically examine these propositions in the field of leisure time activities.

Duration of Adolescent Organized Activities and Implications for Adult Leisure Time Activities

According to bioecological theory, the activities that individuals engage in for longer periods of time have greater effects and "activities must continue long enough" to be developmentally effective (Bronfenbrenner & Morris, 1998, p.996). Duration of participation in organized activities indicates an ongoing and persistent commitment over a period of time (Bohnert et al., 2010). The duration of adolescent activity participation has important implications for future activity participation in adulthood. Specifically, this ongoing commitment provides sufficient time for adolescents to engage with activity content and acquire skills for further participation (Côté, Baker, & Abernethy, 2007; Dawes, Vest, & Simpkins, 2014). In addition, it takes time for adolescents to explore opportunities in activities, internalize values and norms, and develop a sense of identification with the activity (Eccles, Barber, Stone, & Hunt, 2003; Fredricks, Alfeld-Liro, Eccles, Hruda, Patrick, & Ryan, 2002; Hansen, Larson, & Dworkin, 2003). For example, longer duration of participation in civic-oriented activities helps individuals develop awareness of social problems (Wray-Lake & Syvertsen, 2011), cultivate civic identity and a sense of purpose for common good, all of which are important for engagement in future civic behaviors (Damon, Menon, & Bronk, 2003; Youniss et al., 1999).

Existing studies have found preliminary support for a positive association between the duration of adolescent organized activity participation and leisure time activities in adulthood. For example, in longitudinal studies outside of U.S., researchers find that duration of

membership in organized youth sport is positively related to the frequency of leisure-time physical activity in adulthood (Bélanger et al., 2015; Kjønniksen, Anderssen, &Wold, 2009; Telama, Yang, Hirvensalo, & Raitakari, 2006). In contrast, much less work has been conducted in the U.S. As an exception, Perkins and colleagues (2004) found that sport activity participation at age 12 predicted sport and fitness activities in emerging adulthood. With regard to civic activities, research has focused on the implications of frequency of participation. For example, Hart and colleagues (2007) found that more frequent community service in 12th grade was associated with higher likelihood of volunteering eight years after high school. No study, however, has followed individuals over time to measure the duration of participation in adolescence.

In the field of organized art activities, researchers (Freer & Evans, 2018) found that more years of prior instrumental experience was related to high school students' decisions to taking elective courses in music. However, no robust longitudinal studies have followed participants beyond adolescence to explore how earlier activity participation is related to leisure time art activities in adulthood. Similarly, although many adolescents in the U.S. are involved in organized religious youth groups (Smith, Denton, Faris, & Regnerus, 2002), little work has examined if adolescent participation in these youth groups prepare individuals for religious attendance in adulthood. For all four types of activities, existing work rarely explores how specific features of the proximal processes within adolescent activity settings are related to leisure time activities in adulthood.

Quality of Adolescent Activities and Implications for Adult Leisure Time Activities

Participation in leisure time activities in adulthood are volitional behaviors, and are often a matter of personal choice (Sylvia-Bobiak & Caldwell, 2005). These choices are not only

related to the length of prior exposure to similar activities, but also depend on the nature of individuals' prior experience with the activity. According to expectancy-value theory, individuals' choice to engage in an activity is influenced by two important indicators. One is individuals' intrinsic value of the activity, defined as the *enjoyment* they get from performing an activity (Eccles, 1983; Eccles & Wigfield, 2002). A second indicator is whether people believe they are good at or have skills to participate (Eccles, 1983; Wigfield & Eccles, 2002). Aligning with these theoretical perspectives, scholars propose that when social contexts offer both a sense of enjoyment and opportunities for skill development, individuals would be more motivated to participation in the activity both concurrently and at future time points (Wigfield et al., 2016).

Existing work on sport and art activities provides initial insight on the importance of enjoyment and skills for continued activity participation (e.g., Allender, Cowburn, & Foster, 2006; Baker, 2009; Simpkins et al., 2010). Intrinsic value and enjoyment of physical activity is an important motivation for sport activity participation for both youth and adults (Allender et al., 2006; Rhodes, Fiala, & Conner, 2009; Weiss & Williams, 2004). In contrast, lack of enjoyment and perceptions of incompetence are two of the top reasons for dropping out of sport activities among children and adolescents (Crane & Temple, 2015). In a longitudinal study following children over four years (Dawes et al., 2014), researchers found that both value (e.g., enjoyment) and perceived competence in sports predicted later participation in organized sport activities. In studies on organized art activities, researchers found that the primary motivational predictor for continuing art activities such as music ensemble is the enjoyment and pleasure gained from conducting the activity itself (Baker, 2009). Similarly, in another longitudinal study following participants from elementary to middle school, Simpkins and colleagues (2010) also

found that positive affects in elementary school music activities predicted participation in music activities in middle school.

Despite the reviewed literature on the implications of enjoyment and skills for activity participation, previous research tends to be conducted over a short time span. It is yet known if similar associations would be observed over a longer time span between adolescent organized activities and leisure time activity choice in adulthood. In addition, more existing work focuses on sport and art activities, and research is extremely limited on other types of activities, including volunteer/community services and religious activities. Therefore, in the current study, we used longitudinal data from adolescence to adulthood, and examined two aspects of the quality of experiences in adolescent activities: sense of enjoyment in activity, and whether adolescents feel like they are taught new skills in activity. We examined their associations with adulthood leisure time activity choice, together with duration of participation. In addition, we examined these associations among various types of adolescent activities, including sport, art, volunteer/community services, as well as religious youth groups.

Within- and Across-Type Associations

Another important question related to activity participation is whether the associations between adolescent organized activities and adult leisure time activities only exist within the same activity type or if associations across different types of activities also emerge. According to Bornstein's specificity principle (2019), individuals' experiences with a specific context have implications for their development in a specific domain. Aligning with this perspective, individuals' participation in a specific activity during adolescence should predict participation in similar types of activities at subsequent time points due to processes related to domain-specific skills, motivation, identity, and autonomy (e.g., Weiss, 2001; Whitehead, 2013). Aligning with

the specificity principle, most of the existing research focuses on within-activity type association and has provided support for this principle.

Scholars have also proposed possible cross-type associations, in both positive and negative ways. Specifically, researchers argue that positive cross-type association is more likely to exist when two types of activities represent "close domains", entailing content and skills that are more related to each other (Möller & Marsh, 2013). For example, volunteer/community services and religious youth groups are "close domains" as both activities emphasize prosocial behaviors and values, as well as collaborative work for the common good (Thomas & McFarland, 2006). Researchers argue that when activities represent "close domains", values of and skills/competences in one activity will be positively related to participation in the other activity (Möller & Marsh, 2013). In contrast, when activities represent "far domains", values of and skills/competences in one activity could have potential negative associations with engagement in the other type of activity. For example, sports and arts are "far domains" as organized sport and art activities are usually participated in by people with very different characteristics. Specifically, researchers found that "jocks" were overrepresented in sports activities, whereas "princesses" were overrepresented in performing arts (Eccles et al., 2003). Despite these theoretical propositions on within- and cross-type associations, no empirical research has examined these hypotheses across a various types of activities.

Current Study

The current study contributes to the current understanding of the association between adolescent organized activities and adulthood leisure time activity choice in three ways. First, the current study examines both duration and specific features of the proximal processes (i.e., enjoyment and skill development) in adolescent activities as well as their associations with

leisure time activities in adulthood. Second, we examined these associations on four types of adolescent activities (i.e., sport, art, volunteer/community service, religious youth groups) to see if similar patterns occur. Third, by focusing on four types of adolescent activities, we also examines if associations would be observed within and across different types of activities.

Method

Participants

The current study used data from the NICHD Study of Early Child Care and Youth Development (SECCYD), which is a longitudinal study of 1,364 U.S. children (48% female) and their families recruited at 10 locations in 1991. Participating children and families were recruited at children's birth and were assessed at regular intervals for the subsequent years through age 26. For a full discussion of the NICHD SECCYD sampling design, see NICHD Early Child Care Research Network (2005).

For the current study, 1,041 participants who responded to questions about their participation in organized activities during at least one data point in adolescence (i.e., 6th grade, age 15, and 12th grade). The analytic sample was 50% female adolescents. Participants were from different ethnic backgrounds and the sample was racially/ethnically representative of the U.S. population at the time of data collection (77% White, 12% Black, 6% Hispanic, 5% Other). The average years of mother education was 14.44 years (*SD* = 2.44, Min = 7, Max = 21), with 39% of the mothers having a college degree or above. The analytic sample was also diverse in terms of family income, with the average income to needs ratio in middle childhood (1st to 5th grades) was 4.28 (*SD* = 3.51, Min = .10, Max = 24.13). The analytic sample (*n* = 1041) was comparable to the dropped sample (*n* = 323) with regard to gender and ethnic minority distribution (see Table 2.1). However, participants in the analytic sample were from families of

higher maternal education as well as higher quality of home environment in 5th grade.

Measures

Activity duration in adolescence. Activity participation was assessed in 6th grade, at age 15 (9th & 10th grade), and in 12th grade. In 6th grade, adolescents reported through questionnaires their participation in each of the following three types of organized activities: sport (e.g., football, gymnastics, tennis, swimming, and cheerleading), art (e.g., piano lessons, dance class), and religious youth groups (e.g., Sunday school, youth fellowship group). In 6th grade, participants indicated yes or no to the following questions: "During the Fall semester, did you do any" (a) "organized sports (teams or activities)", (b) "music, dance, drama, or art activities", (c) "religious services, classes, or groups" "after school or on weekends?" At age 15 and in 12th grade, adolescents completed a same questionnaire reporting on their participation in the same types of activities as well as volunteer/community services. Participation duration in each activity (sport, art, volunteer/community services, religious) was then calculated by counting the number of time points adolescents answered yes to participating in each specific activity type. Activity duration ranged 0-3 for sport and art, and 0-2 for volunteer/community services. Descriptives of all adolescent activity variables are presented in Appendix Tables 2.2.

Perceived quality of activity experiences in adolescence. In 6th grade, age 15, and 12th grade, adolescents responded to two questions about their experiences in each attended activity: (a) how much did you like doing the activity? and (b) did the coach or leader help you learn new skills or things you didn't know about before? These questions captured both the level of enjoyment and skill development in adolescent activities. Both questions were scored on a 0-3 scale (0 = *not at all*, 1 = *only a little*, 2 = *somewhat*, 3 = *very much*). If an adolescent did more than one activity within a specific type (e.g., two sport activities), they were asked about their

favorite activity. Scores on each item were averaged across 6th grade, age 15, and 12th grade in order to capture the overall enjoyment and skill development in each type of adolescent activity.

Age 26 leisure time activities. At age 26, participants self-reported their participation in five activities during leisure time: team sport, fitness/exercise, organized art, volunteer or charity work, and religious attendance in the past 12 months. For sport, art, volunteer or charity, participants were asked "During the last 12 months, about how often did you participate" (a) "on an athletic or sport team", (b) "exercise or do any fitness activity", (c) "in any organized activities related to art, music, or the theater", and (d) " helped out, in any type of volunteer work or helped a charitable organization (gave your time or money)". These questions were adapted from the Panel Study of Income Dynamics (PSID; 2015) and the Michigan Study of Adolescent Life Transitions (MSALT; Eccles & Barber, 1993). All questions were scored on a 7-point scale (0 = *never*, 1= *less than once a month*, 2 = *at least once a month*, 3 = *once a week*, 4 = *several times a week*, 5 = *almost every day*, 6 = *every day*). Similar measures of leisure time activities have also been used in previous research (e.g., Bartkowski & Xu, 2007; Regnerus & Uecker 2006). For religious attendance, participants were asked "How often do you attend religious services?" and the question was scored on a 4-point scale (0 = *never*, 3 = *about once a week or more*). This question was adapted from the study of Monitoring the Future (Miech, Johnston, O'Malley, Bachman, & Schulenberg, 2016).

Consistent with leisure time activity participation patterns among the general U.S. population (American time use survey by U.S. Bureau of Labor Statistics, 2019), distributions of responses were skewed on all age 26 leisure time activities in the current sample. Specifically, about 60% of the sample never participated in team sport, about 30% never participated in any organized art activities or volunteer/charity work, and about 40% never attended religious

services in the past 12 months. Therefore, all age 26 leisure time activity variables were recoded to dichotomous indicators, with "*never*" indicating no participation and the rest indicating participation in the specific activity with the exception of fitness/exercise activities. As recommended by the U.S. Center for Disease Control and Prevention, adults should do some physical activity every week (Center for Disease Control and Prevention, 2020). Therefore, frequency of *fitness/exercise* activity was recoded such that frequencies less than "*once a week*" were coded as no participation in fitness/exercise activity (30%) and frequencies at or higher than "*once a week*" were coded as no participation in fitness/exercise activity (70%). Descriptives of age 26 leisure time activity participation are presented in Appendix Table 2.3.

Missing Data

Among the 1,041 participants who reported organized activity participation in adolescence, 805 had complete data on both adolescent and adult activities. There were significant difference between participants with complete data and those with missing data on background characteristics. Specifically, compared to individuals having missing data, participants with complete data were more likely to be female ($X^2(1) = 11.03$, $p = .001$, $V = .10$) and White ($X^2(1) = 37.55$, $p < .001$, $V = .19$). In addition, participants with complete data were more likely to come from families with higher maternal education ($t(1041) = 6.30$, $p < .001$, $d = .47$), higher income-to-needs ratio in middle childhood ($t(1031) = 4.87$, $p < .001$, $d = .38$), as well as higher quality home environment in 5th grade ($t(1019) = 7.62$, $p < .001$, $d = .53$). To control for potential biases caused by missing data, multiple imputation was used to handle missing data in the current sample ($n = 1041$). Following imputation procedures recommended by Enders (2010), we imputed 30 datasets where activity participation variables in adolescence

and adulthood, as well as covariates were all imputed using multiple chained equations. Imputed datasets were then used in regression analyses.

Plan of Analysis

All statistical analyses were estimated in STATA 14. Our research goal was to examine associations between the duration and quality of experiences in four types of adolescent organized activities (i.e., sport, art, volunteer/community services, and religious youth groups) and leisure time activity participation at age 26. Specifically, we examined both within- and cross-type associations between adolescent organized activities and leisure time activities in adulthood. To examine within-type associations, each leisure time activity at age 26 was regressed onto participation duration and quality of the same type of adolescent organized activity. For example, team sport participation at age 26 was regressed onto the duration and quality of experiences in adolescent sport activities. To examine cross-type associations, each leisure time activity at age 26 was regressed onto participation duration and quality of the other types of adolescent organized activity. For example, team sport participation at age 26 was regressed onto the duration and quality of experiences in adolescent art activities, volunteer/community services, and religious youth groups in three separate models. In all models, duration and quality of experiences of adolescent organized activities were included simultaneously to estimate if each participation indicator in adolescent activity was associated with age 26 leisure time activities above and beyond each other. In all of our analyses, we controlled for individual and family characteristic, including gender (male = 0), ethnic minority status (White = 0), average income to needs ratio from 1st to 5th grade, and the quality of home environment in 5th grade.

Results

Descriptive Statistics

Means, standard deviations, and bivariate correlations for key variables are presented in Table 2.2. Within-type associations were observed for all types of activities. Specifically, longer durations of participation in adolescent sport, art, volunteer/community service, as well as religious youth groups were associated with more likelihood of participation in the same type of leisure time activity at age 26 (r's = .15 – .44, $p < .001$). The quality of adolescent activities was also associated with participation in leisure time activities of the same type. Specifically, for all type of activities, reports of higher enjoyment in adolescent activities were associated with higher likelihood of participation in the same type of leisure time activities at age 26 (r's = .12 – .25, $p < .01$). For sport and religious activities, more opportunities for skill development in adolescent activities were associated with higher likelihood of participation in the same type of leisure time activities at age 26 (r's = .12 – .25, $p < .01$).

Cross-type associations were also observed. Specifically, longer duration of participation in adolescent volunteer/community service activities was related to higher likelihood of participation in team sport and fitness/exercise at age 26 (r's = .12 & .14, $p < .001$). In contrast, longer duration and higher level of enjoyment in adolescent art activities were associated with lower likelihood of participating in team sport at age 26 (r's = -.09 – -.12, $p < .05$). Longer durations of adolescent sport and volunteer/community service were associated with higher likelihood of art leisure time activity participation at age 26 (r's = .08 & .09, $p < .05$). Longer duration and more positive quality of experience in all other types of adolescent activities (i.e., sport, art, religious youth groups) were related to higher likelihood of participation in volunteer and charity activities at age 26 (r's = .09 – .15, $p < .05$). Finally, longer duration and more skill

development in adolescent volunteer/community service were associated with higher likelihood of religious attendance at age 26 (r's = .12 & .13, $p < .01$). Similarly, reports of more enjoyment and skill development in adolescent sport activities were also associated with higher likelihood of religious attendance at age 26 (r's = .11 & .09, $p < .05$).

Adolescent Activities and Adult Leisure Time Activities: Within-Type Analysis

Our research goal was to examine associations between the duration and quality of experiences in each type of adolescent activity (i.e., sport, art, volunteer/community services, and religious youth groups) and leisure time activity participation at age 26. First, we examined within type association between adolescent activities and leisure time activities of the same type at age 26. Aligning with our hypotheses, results from regression analyses indicated that duration of adolescent activities was positively associated with participation in same type leisure time activities in adulthood. As shown in Table 2.3, we found that adolescents who participated in sport activities for a longer duration were more likely to participate in team sport (OR = 1.97, SE = .24, $p < .001$) and fitness/exercise (OR = 1.33, SE = .17, p = .026) at age 26. Similarly, individuals who participated in adolescent volunteer/community services activities for longer duration were more likely to engage in volunteer/charity work (OR = 1.71, SE = .39, p = .019) at age 26. Similar positive associations emerged for religious activities (OR = 2.03, SE = .27, $p < .001$). Although the bivariate correlation suggested association between duration of adolescent art activities and age 26 leisure time activities in organized art (r = .15, p <.001; Table 2.2), this association was no longer statistically significant once we accounted for the quality of experiences in adolescent art activities.

Enjoyment of adolescent activities instead of skill development was associated with participation in same type leisure time activities at age 26. Specifically, individuals reporting

higher levels of enjoyment in adolescent sport activities were more likely to participate in team sport (OR = 1.90, *SE* = .39, *p* = .002) and fitness activities (OR = 1.59, *SE* = .28, *p* = .009) at age 26. Similarly, for art activities as well as volunteer/charity work, individuals who reported higher levels of enjoyment in adolescent activities were more likely to participate in same type leisure time activities (OR's = 1.43 & 1.41, *SE*'s = .23, *p*'s = .029 & .037) at age 26. Although perceived enjoyment and skill development opportunities in youth religious group were related to age 26 religious attendance (*r*'s = .23 & .25; Table 2.2), these associations were not statistically significant once we controlled for duration and a list of covariates.

Adolescent Activities and Adult Leisure Time Activities: Cross-Type Analysis

In order to explore if associations between adolescent activities and adult leisure time activities will be observed across activity types, we also ran a set of logistic regressions where we examined possible cross-type associations (Tables 2.4 –2.7). Adolescent sport activity and volunteer/community services were associated with participation in other types of leisure time activities in adulthood. Specifically, individuals who had longer duration of participation in adolescent sport activities (OR = 1.29, *SE* = .16, *p* = .046) and those who reported more skill development in these activities (OR = 1.37, *SE* = .21, *p* = .043) were more likely to participate in volunteer/charity work at age 26. Higher levels of enjoyment in adolescent sport activities were also related to higher likelihood of religious attendance at age 26 (OR = 1.55, *SE* = .27, *p* = .012). In addition, adolescents who participated in volunteer/community services for longer time were more likely to participate in fitness/exercise at age 26 (OR = 1.63, *SE* = .36, *p* = .029). Individuals reporting more skill development in adolescent volunteer/community services were also more likely to have religious attendance at age 26 (OR = 1.29, *SE* = .16, *p* = .041). In

contrast, adolescent participation in art activities and religious youth groups was not associated with any adulthood leisure time activities of a different type.

Discussion

Previous research suggests that adolescent organized afterschool activities help prepare individuals for leisure time activities in adulthood (Baker, 2009; Bélanger et al., 2015; Hart et al., 2007; Kjønniksen et al., 2009; Telama et al., 2006). However, little research has examined specific features of adolescent organized activities and their associations with adult leisure time activities. In addition, it is yet known if these associations are constrained to the same type of activity or exist across different types of activities. In order to address these gaps, the current study examined the duration, enjoyment, and skill development in four types of adolescent organized activities (i.e., sport, art, volunteer/community services, as well as religious youth groups) and their associations with adulthood leisure time activities. In addition, we examined both within- and cross-type associations. Findings from the current study provide support to the association between adolescent organized afterschool activities and leisure time activities in adulthood. Specifically, we found that both the duration and enjoyment in adolescent activities predicted same type leisure time activity participation in adulthood. In addition, we found some cross-type associations across sport, volunteer/community services, as well as religious youth groups.

Duration of Participation

Findings from the current study suggest that individuals who participate in organized activities for a longer time during adolescence are also more likely to participate in leisure time activities of the same type at age 26. Such association is found for sport, volunteering/community services, as well as religious youth groups. Although bivariate

associations suggests that longer duration of adolescent art activity is associated with more likelihood of organized art activity participation in adulthood, such associations became statistically nonsignificant once we took into consideration the quality of experiences in adolescent activities as well as covariates. Aligning with the bioecological theory (Bronfenbrenner & Morris, 2005) and previous research on organized activities (Bélanger et al., 2015; Telama et al., 2006), these findings highlight the importance of duration for activity participation.

One possible explanation connecting duration to adult leisure time activities is that ongoing participation in an activity during adolescence promotes identity formation related to the specific activity (Fredricks et al., 2002), which could then promote life-long commitment. This parallels models of the development of civic identity (Youniss, McLellan, & Yates, 1997) in which participation in civic activity during identity formation periods (i.e., adolescence) is seen as instrumental in the formation of adult civic commitment and activity. In addition to identity formation, researchers have also suggested that longer duration of participation promotes skills and expertise in a specific activity, which has been found true for adolescent sport and art activities (Côté et al., 2007; Ericsson, 2003). However, the current study did not find support to such explanation as skill development was not related to later leisure time activities for any types of activities under study. We discuss this lack of association in more depth in the next section.

Enjoyment in Activity

According to expectancy-value theory (Eccles, 1983), intrinsic or interest value is a strong predictor of choices. Aligning with this perspective, findings from the current study suggests that enjoyment in adolescent activities is linked to later participation in leisure time activities into adulthood. Our findings are consistent with previous research on physical and art

activities. It is documented in literature that positive affective responses to earlier activity is associated with intrinsic and more self-determined extrinsic motivations for sport and art in the near future (Lutz, Lochbaum, & Turnbow, 2003; Robbins, Pis, Pender, & Kazanis, 2004). It is, therefore, possible that adolescents who report higher level of enjoyment in organized sport and art activities perceived more intrinsic values in participation and are more likely to participate for the inherent pleasure of participation, which is then associated with persistent participation in emerging adulthood. Considering that leisure time activities in adulthood are often voluntary and are intrinsically rewarding or meaningful to the individual (Caldwell, 2005; Mobily, Lemke & Gisin, 1991), it is expected that a sense of enjoyment in the activity itself would play a prominent role in the choice of leisure time activity.

Skill Development in Activity

Although previous research finds that skills and level of competences are related to activity participation in childhood and adolescence, the current study did not find such associations between adolescent organized activities and leisure time activities in adulthood, once we controlled for duration and enjoyment of participation. This finding is consistent with research on academic achievement where literature suggests that values or interest in an academic subject are more relevant for career or major choices, whereas individuals' ability beliefs and perceptions of skill levels are often a stronger predictor of actual performance (Spinath, Spinath, Harlaar, & Plomin, 2006). In addition, this lack of statistically significant finding might also be explained by the nature of leisure time activities in adulthood. Leisure time activity choices in adulthood are often guided by interest and a sense of intrinsic motivation (Caldwell, 2005). These activity often requires little more than minimal prior skills (Stebbins, 2013). When adults make decisions about whether to participate in sport and art related leisure

time activities, it might be the sense of enjoyment that they recall from previous participation that motivate them to continue with the particular activity.

It is important to note, however, that the nonsignificant association between skill development and adulthood leisure activity participation does not mean that skills are not important for leisure time activity choice. Previous research on academic motivation suggests that when individuals believe they are competent in an activity, they were more likely to value the activity (Jacobs, Lanza, Osgood, Eccles, & Wigfield, 2002). Future work should explore the interplay between enjoyment and skill development in organized activities and examine if enjoyment in an activity functions as a pathway linking skills and competence to choice of activity participation. In addition, the nature of the current analyses might partly explain the statistically nonsignificant finding on other quality indicators, as regression analyses get at the relative predictive power of each quality indicator and enjoyment of adolescent activities might be more predictive of related leisure choices in adulthood than skill development.

Within- versus Cross-Type Associations

Majority of statistically significant findings from the current study suggest within-type association between adolescent organized activities and leisure time activities in adulthood. These findings are consistent with the specificity principle of human development (Bornstein, 2019). It is likely that experiences in adolescent activities help develop domain-specific motivational beliefs, in this case, the value of an activity, which further motivates individuals to keep participating in related leisure activities in adulthood. In addition to within-type associations, the current study also find cross-type associations among sport, volunteering, and religious activities. Although the cross-type associations were small to moderate in size, the positive association between volunteer/community services and religious attendance is consistent

with previous work, where researchers argue that these two types of activities share similarities in their content and goals (Möller & Marsh, 2013; Thomas & McFarland, 2006). Findings from the current study suggest that skills acquired from volunteer-community services are transferrable to religious attendance.

Cross-type association was also found between sports and volunteer/charity activities. Specifically, longer duration and skill development in adolescent sport activities predicted participation in volunteer/charity work in adulthood. This finding is consistent with prior work where researchers find adolescent sport participation predicts civic engagement in adulthood (Rotolo, Johnson, & McCall, 2020). Although the current study did not specify which skills individuals developed from activity participation, previous research on sport activities suggest that adolescent participation in organized sports, especially team sports create a communal environment where individual interact with peers from diverse backgrounds. This group-based environment in sport activities could engage individuals in collaborative tasks, from which individuals can develop a sense of community (Perks, 2007). As a sense of communal identity is a strong predictor of civic participation (McFarland & Thomas, 2006), participation in sports activities could thus promote civic behaviors such as volunteering and charity work.

Limitations and Future Directions

We note several study limitations. First, although we measured skill development in adolescent activities, the current research did not measure what specific skills adolescents acquired in these activity settings and their implications for adult leisure activity choice. As organized activities promote skill development in multiple domains (Hansen et al., 2003), future research can build on existing work and examine how specific skills developed from adolescent organized activities help promote leisure time activities in adulthood, as well as the processes

underlying such associations. Second, as organized activities are voluntary in nature, the current study could not rule out the potential selection effect of enjoyment. Future work should examine potential reciprocal relationships between enjoyment and participation (Simpkins et al., 2010). Third, although enjoyment is found to be associated with leisure time activities in adulthood, researchers have proposed that enjoyment can be an immediate outcome of other quality features in the activity setting (Smith, Akiva, McGovern, & Peck, 2014), and a pathway to skill development as well as more distal outcomes. Researchers can thus explore such pathways by taking into account multiple quality indicators and explore the processes of change. Finally, as identity development has been proposed as a potential mechanism linking adolescent activity participation to future development, future research should also explore mechanisms related to identity work.

Conclusion

Findings from the current study highlight association between adolescents' organized activities and leisure time activities in adulthood. Longer duration and more perceived enjoyment of adolescent activities are both related to more likelihood of participation in adult leisure time activities of the same kind. In addition, cross-type association is observed among sport, volunteering and religious activities. Our study suggests the important role of adolescent organized activities in promoting healthy leisure time activities in adulthood. In addition, findings on cross-type associations indicate adolescent activity participation can promote a broad form of participation later in life. It is recommended that policy makers and practitioners collaborate with researchers to design activity environments that provide positive affective experiences, which have important implications for lifelong participation.

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Table 2.1
Descriptives of Recruitment, Analysis, and Dropped Samples

	Recruitment		Analytic sample[1]		Dropped sample		Significant difference between the analytic and dropped samples	
	M(%)	*SD*	M(%)	*SD*	M(%)	*SD*	*p*	Cohen's *d*[a]/Cramér's *V*[b]
N	1364		1041		323			
Female	48%		50%		44%		.06	.05[b]
White	76%		77%		74%		.31	.03[b]
Maternal education	14.23	2.51	14.44	2.44	13.58	2.62	<.001	.34[a]
Income-to-needs ratio 1st-5th grade	4.26	3.46	4.28	3.51	3.92	2.75	.36	.12[a]
HOME[2] score 5th grade	41.45	5.73	41.30	5.68	44.52	6.12	<.001	.55[a]

Note. [1]Analytic sample includes participants who had activity data during adolescence (i.e., 6th grade, 9th grade, and 12th grade).
[2]HOME score is a composite score of the Home Observation Measurement of the Environment scale in 5th grade.
[a]Cohen's *d*: .20 small effect size, .50 moderate effect size, and .80 large effect size.
[b]Cramér's *V*: .10 small effect size, .30 moderate effect size, and .50 large effect size.

Table 2.2

Correlations between Adolescent Organized Activity Variables and Age 26 Leisure Activities

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Sport activities in adolescence (6th -12th grade)																	
1. Duration	-																
2. Enjoyment	.38[c]	-															
3. Skill development	.17[c]	.36[c]	-														
Art activities in adolescence (6th -12th grade)																	
4. Duration	.06	-.04	.06	-													
5. Enjoyment	-.05	.06	.14[c]	.23[c]	-												
6. Skill development	-.01	.06	.20[c]	.15[c]	.45[c]	-											
Volunteer/Community service in adolescence (6th -12th grade)																	
7. Duration	.23[c]	.16[c]	.18[c]	.21[c]	.09[a]	.13[b]	-										
8. Enjoyment	.08[a]	.12[b]	.13[b]	.06	.20[c]	.07	.14[c]	-									
9. Skill development	.06	.13[b]	.11[b]	.02	.11[a]	.11[a]	.08[a]	.57[c]	-								
Religious youth groups in adolescence (6th -12th grade)																	
10. Duration	.18[c]	.02	.05	.19[c]	.03	.07	.28[c]	.12[b]	.11[b]	-							
11. Enjoyment	-.02	.07	.12[b]	.09[a]	.08	.09[a]	.08[a]	.22[c]	.22[c]	.27[c]	-						
12. Skill development	.02	.14[c]	.24[c]	.05	.09	.18[c]	.13[c]	.20[c]	.27[c]	.25[c]	.57[c]	-					
Age 26 Leisure Activities																	
13. Team sport	.34[c]	.25[c]	.14[c]	-.09[a]	-.12[b]	-.02	.12[c]	.06	.04	.06	.00	.04	-				
14. Fitness/exercise	.22[c]	.17[c]	.12[b]	.01	-.07	-.00	.14[c]	.04	.06	.04	-.00	.03	.23[c]	-			
15. Organized art	.08[a]	.04	.02	.15[c]	.12[b]	.06	.09[a]	.08	-.02	.03	.01	-.00	.15[c]	.00	-		
16. Volunteer/charity	.14[c]	.09[a]	.14[c]	.12[c]	.14[b]	.07	.25[c]	.15[c]	.04	.15[c]	.05	.06	.23[c]	.12[c]	.27[c]	-	
17. Religious attendance	.00	.11[b]	.09[a]	.04	.00	.07	.12[c]	.07	.13[b]	.44[c]	.23[c]	.25[c]	.08[a]	.01	-.00	.16[c]	-
Mean	1.78	2.93	2.68	1.11	2.74	2.70	0.87	2.78	2.38	1.34	2.37	2.40	0.42	0.70	0.68	0.70	0.57
SD	1.00	0.56	0.61	1.03	0.69	0.68	0.79	0.83	0.95	1.10	0.84	0.84	0.49	0.46	0.47	0.46	0.49

Note. [a]$p < .05$. [b]$p < .01$. [c]$p < .001$.

Table 2.3

Within-Type Analysis: Association between Adolescent Activities and Age 26 Leisure Activities

	Team sport[1]		Fitness/exercise[1]		Organized Art[2]		Volunteer/charity[3]		Religious attendance[4]	
	OR[5]	*p*	OR[5]	*p*	OR[5]	*p*	OR[5]	*p*	OR[5]	*p*
Adolescent activity of the same type										
Duration	1.97***	<.001	1.33*	.026	1.30†	.066	1.71*	.019	2.03***	<.001
Enjoyment	1.90**	.002	1.59**	.009	1.43*	.029	1.41*	.037	1.24	.139
Skill development	1.24	.236	1.13	.475	.95	.763	.91	.491	1.28†	.066
Covariates										
Female	.51***	<.001	.71†	.063	.88	.546	1.55†	.052	1.33	.150
Ethnic minority	.99	.956	.68†	.074	1.03	.912	.86	.621	1.47	.188
Income to needs ratio (1st-5th grade)	1.02	.533	1.05	.121	1.00	.904	1.00	.938	.97	.420
HOME[6] (5th grade)	1.01	.437	1.03	.119	1.03	.158	1.04†	.091	.98	.545

Note. [1]Model used adolescent sport activities as predictors; [2]Model used adolescent art activities as predictors; [3]Model used adolescent volunteer/community services as predictors;

[4]Model used adolescent religious youth groups as predictors.

[5]OR (odds ratio): OR > 1indicates increased probability of occurrence of the outcome variable; OR < 1 indicates reduced probability of occurrence of the outcome variable. All model controlled for 9 dummy variables for data collection sites.

[6]HOME score is a composite score of the Home Observation Measurement of the Environment scale in 5th grade.

† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 2.4

Cross-Type Analysis: Association between Adolescent Sport Activities and Age 26 Leisure Activities

	Organized art		Volunteer/charity		Religious attendance	
	OR[1]	*p*	OR[1]	*p*	OR[1]	*p*
Adolescent sport activity						
Duration	1.15	.214	1.29*	.046	.91	.400
Enjoyment	.99	.974	.95	.769	1.55*	.012
Skill development	.98	.879	1.37*	.043	1.12	.418
Covariates						
Female	1.10	.557	1.84***	<.001	1.53**	.005
Ethnic minority	.93	.732	.79	.276	1.47†	.076
Income to needs ratio (1st-5th grade)	1.00	.919	1.02	.498	.97	.268
HOME score[2] (5th grade)	1.02	.360	1.03 †	.080	1.03†	.100

Note. [1]OR (odds ratio): OR > 1indicates increased probability of occurrence of the outcome variable; OR < 1 indicates reduced probability of occurrence of the outcome variable. All model controlled for 9 dummy variables for data collection sites.

[2]HOME score is a composite score of the Home Observation Measurement of the Environment scale in 5th grade.

† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 2.5

Cross-Type Analysis: Association between Adolescent Art Activities and Age 26 Leisure Activities

	Team sport		Fitness/exercise		Volunteer/charity		Religious attendance	
	OR[1]	*p*	OR[1]	*p*	OR[1]	*p*	OR[1]	*p*
adolescent art activity								
Duration	.86	.248	1.12	.408	.98	.878	.93	.578
Enjoyment	.75†	.067	.86	.362	1.32†	.098	.90	.510
Skill development	1.11	.498	1.05	.782	.98	.908	1.27	.152
Covariates								
Female	.63*	.012	.81	.334	1.69**	.010	1.75**	.003
Ethnic minority	1.02	.952	.81	.462	.98	.936	1.64†	.070
Income to needs ratio (1st-5th grade)	1.02	.500	1.06†	.079	1.01	.701	.95†	.051
HOME score[2] (5th grade)	1.03	.205	1.04†	.077	1.05*	.029	1.03	.216

Note. [1]OR (odds ratio): OR > 1indicates increased probability of occurrence of the outcome variable; OR < 1 indicates reduced probability of occurrence of the outcome variable. All model controlled for 9 dummy variables for data collection sites.

[2]HOME score is a composite score of the Home Observation Measurement of the Environment scale in 5th grade.

† $p < .10$. * $p < .05$. ** $p < .01$.

Table 2.6

Cross-Type Analysis: Association between Adolescent Volunteer/Community Services and Age 26 Leisure Activities

	Team sport		Fitness/exercise		Organized art		Religious attendance	
	OR[1]	*p*	OR[1]	*p*	OR[1]	*p*	OR[1]	*p*
Adolescent volunteer/community services								
Duration	1.35	.103	1.63*	.029	.87	.497	1.45†	.065
Enjoyment	1.16	.261	.89	.458	1.24	.197	1.05	.737
Skill development	1.08	.507	1.17	.236	.90	.453	1.29*	.041
Covariates								
Female	.47***	<.001	.76	.222	1.11	.588	1.29	.162
Ethnic minority	.84	.514	.61†	.068	1.01	.977	1.44	.174
Income to needs ratio (1st-5th grade)	1.03	.317	1.07†	.070	1.00	.919	.95*	.049
HOME score[2] (5th grade)	1.02	.469	1.02	.472	1.03	.220	1.02	.373

Note. [1]OR (odds ratio): OR > 1indicates increased probability of occurrence of the outcome variable; OR < 1 indicates reduced probability of occurrence of the outcome variable. All model controlled for 9 dummy variables for data collection sites.
[2]HOME score is a composite score of the Home Observation Measurement of the Environment scale in 5th grade.
† $p < .10$. * $p < .05$. *** $p < .001$.

Table 2.7

Cross-Type Analysis: Association between Adolescent Religious Youth Groups and Age 26 Leisure Activities

	Team sport		Fitness/exercise		Organized art		Volunteer/charity	
	OR[1]	*p*	OR[1]	*p*	OR[1]	*p*	OR[1]	*p*
Adolescent religious youth groups								
Duration	1.07	.589	1.11	.432	1.10	.432	1.20	.184
Enjoyment	1.02	.909	1.15	.362	1.01	.965	1.08	.590
Skill development	1.12	.391	1.02	.895	1.02	.854	1.05	.724
Covariates								
Female	.47***	<.001	.64*	.025	1.01	.972	1.55*	.024
Ethnic minority	1.05	.840	.73	.224	1.03	.919	.84	.508
Income to needs ratio (1st-5th grade)	1.07*	.029	1.04	.223	1.03	.459	1.06	.149
HOME score[2] (5th grade)	1.03	.285	1.05†	.051	1.02	.442	1.03	.150

Note. [1]OR (odds ratio): OR > 1indicates increased probability of occurrence of the outcome variable; OR < 1 indicates reduced probability of occurrence of the outcome variable. All model controlled for 9 dummy variables for data collection sites.
[2]HOME score is a composite score of the Home Observation Measurement of the Environment scale in 5th grade.
† $p < .10$. * $p < .05$. *** $p < .001$.

Appendix Table 2.1

Scale Information for Measures Used in the Current Study

Adolescent activity participation in 6th grade (0 = *no*; 1 = *yes*)

1. During the Fall semester, did you do any organized sports (teams or activities) after school or on weekends? (Examples are football, basketball, hockey, soccer, karate, gymnastics, tennis, swimming, and cheerleading.)
2. During the Fall semester, did you do any music, dance, drama, or art activities after school or on weekends? (Examples are piano lessons, church choir, singing lessons, dance class, arts & crafts.)
3. During the Fall semester, did you take part in religious services, classes, or groups after school or on weekends? (Examples are church, synagogue, Bible study, Sunday school, Hebrew class, catechism, confirmation class, youth fellowship group.)

Adolescent activity participation at age 15 (0 = *no*; 1 = *yes*)

1. During the Fall semester, did you do any organized sports (teams or activities) after school or on weekends? (Examples are football, basketball, hockey, soccer, karate, gymnastics, tennis, swimming, and cheerleading.)
2. During the Fall semester, did you do any music, dance, drama, or art activities after school or on weekends? (Examples are piano lessons, church choir, singing lessons, dance class, arts & crafts.)
3. During the Fall semester, did you take part in religious services, classes, or groups after school or on weekends? (Examples are church, synagogue, Bible study, Sunday school, Hebrew class, catechism, confirmation class, youth fellowship group.)
4. During the past year, did you do volunteer or community service work after school or on weekends?

Adolescent activity participation in 12th grade (0 = *no*; 1 = *yes*)

1. During the Fall semester, did you do any organized sports (teams or activities) after school or on weekends? (Examples are football, basketball, hockey, soccer, karate, gymnastics, tennis, swimming, and cheerleading.)
2. During the Fall semester, did you do any music, dance, drama, or art activities after school or on weekends? (Examples are piano lessons, church choir, singing lessons, dance class, arts & crafts.)
3. During the Fall semester, did you take part in religious services, classes, or groups after school or on weekends? (Examples are church, synagogue, Bible study, Sunday school, Hebrew class, catechism, confirmation class, youth fellowship group.)
4. During the past year, did you do volunteer or community service work after school or on weekends?

Quality of experiences in adolescent activities(0 = *not at all*, 1 = *only a little*, 2 = *somewhat*, 3 = *very much*)

1. How much did you like doing the activity?
2. Does the coach or leader help you learn new skills or things you didn't know about before?

Age 26 leisure time activities (0 = *never*, 1= *less than once a month*, 2 = *at least once a month*, 3 = *once a week*, 4 = *several times a week*, 5 = *almost every day*, 6 = *every day*)

1. During the last 12 months, about how often did you participate on an athletic or sports team?
2. During the last 12 months, how often did you exercise or do any fitness activity?
3. During the last 12 months, about how often did you participate in any organized activities related to art, music, or the theater?
4. During the last 12 months, have you participated in, or helped out, in any type of volunteer work or helped a charitable organization (gave your time or money)?
5. How often do you attend religious services?

(0 = *never*, 1= *rarely*, 2= *once or twice a month*, 3 = *about once a week or more*)

Appendix Table 2.2

Distributions (i.e., Number of Epochs) of the Duration of Adolescent Organized Activities

	Sport	Art	Volunteer/community services	Religious youth groups
0	11%	33%	33%	27%
1	19%	27%	36%	22%
2	32%	24%	31%	25%
3	38%	16%	-	25%

Appendix Table 2.3
Distributions of Adult Leisure Time Activities at Age 26

	Team sport	Exercise/fitness	Organized art	Volunteer/charity	Religious attendance[1]
Never	58%	5%	32%	30%	43%
Less than once a month	15%	11%	34%	42%	36%
At least once a month	9%	14%	20%	17%	10%
Once a week	8%	18%	7%	8%	11%
Several times a week	7%	34%	4%	3%	
Almost every day	2%	13%	2%	0.4%	
Every day	1%	5%	1%	0.5%	

Note. [1]Religious attendance is measured on a different scale: 0 = *Never*; 1 = *Rarely*; 2 = *Once or twice a month*; 3 = *About once a week or more*.

CHAPTER 3

Teachers, Afterschool Program Staff, and Mothers: Relationships with Key Adults and Children's Adjustment in Early Elementary School

In elementary school, children face multiple demands, including performing well on academic tasks, developing appropriate classroom behaviors and strong work habits, and becoming socially competent with peers (Wentzel, 2003). Researchers have defined children's adjustment at school to include their academic, social emotional, and behavioral functioning (Buyse, Verschueren, Verachtert, & Damme, 2009; Ladd, 2003; Pianta, Steinberg, & Rollins, 1995). According to bioecological theory, children's relationships with adult caregivers within and outside of school may help foster positive adjustment and prevent negative adjustment in early elementary school (Bronfenbrenner & Morris, 2006). Teacher-child relationships (Pianta, 1999) and mother-child relationships (Contreras, Kerns, Weimer, Gentzler, & Tomich, 2000) have long been recognized as two central relationships for elementary school children; however, millions of elementary school children in the U.S. also spend a substantial amount of time in afterschool programs interacting with adult staff (Vandell, Larson, Mahoney, & Watts, 2015). Yet, little research focuses on the correlates of afterschool staff-child relationships in this significant developmental setting. In the current study, we examine the quality of children's interactions with these three key adults during early elementary school in relation to their adjustment at school one year later.

Using data from the NICHD Study of Early Childcare and Youth Development (SECCYD), our first goal was to examine the variation in terms of closeness and conflict across children's relationships with classroom teachers, afterschool staff, and mothers. Our second goal was to examine the unique linkages between children's closeness and conflict with these three

key adults in 1st grade and children's adjustment (i.e., academic performance, social emotional competences, and behavioral problems) at school the following year.

Adult-Child Relationships and Children's Adjustment at School

According to bioecological theory, the interactional processes that transpire between children and individuals in microsystems constitute the proximal processes of development (Bronfenbrenner & Morris, 2006). In addition, bioecological theory posits that children's adjustment in any one microsystem, such as their adjustment at school, is the result of interpersonal processes in that microsystem as well as other microsystems, including families and afterschool programs. As the cornerstone of children's experiences in the school microsystem, teacher-child relationships form the developmental infrastructure on which children engage in learning activities and social interactions with peers (Pianta, Hamre, & Stuhlman, 2003). In addition to teacher-child relationships, scholars have theorized that mother-child relationships and staff-child relationships in afterschool programs have implications for children's adjustment in school (Contreras et al., 2000; Simpkins, Weiss, McCartney, Kreider, & Dearing, 2006; Vandell, Pierce, & Dadisman, 2005).

Adult-child relationships are multidimensional and include both positive and negative aspects (Harrist, Pettit, Dodge, & Bates, 1994; Pianta et al., 2003). Close relationships are characterized by positive behaviors and affect, including open communication, warmth, and support. Close, positive relationships between children and adults are theorized to promote children's school adjustment for multiple reasons. From a socialization perspective, when children and adults share close, positive relationships, adults are more likely to engage in effective role modelling and coaching of positive coping and prosocial behaviors for children (Kliewer, Fearnow, & Miller, 1996). In addition, positive adult-child relationships facilitate

fundamental cognitive and social skills, such as effortful control (Eisenberg, Zhou, Spinrad, Valiente, Fabes, & Liew, 2005; Hughes, Luo, Kwok, & Loyd, 2008). Furthermore, children who share close relationships with adults are more likely to internalize prosocial values related to academic and interpersonal interactions (Dix, 1991; Grusec & Kuczynski, 1997).

Empirical research supports these claims. Specifically, close teacher-child relationships are associated with children's positive adjustment in school, including better academic performance (Hughes et al., 2008), positive work habits and classroom behaviors (Merritt, Wanless, Rimm-Kaufman, Cameron, & Peugh, 2012; Pianta, Hamre, & Allen, 2012; Yang & Lamb, 2014), and more social skills and prosocial behaviors with peers (Berry & O'Connor, 2010; Merritt et al., 2012). Emerging literature on afterschool programs finds that afterschool staff-child positivity in 1st and 2nd grade is associated with higher academic grades, better social skills, and fewer behavioral problems in school (Pierce, Bolt, & Vandell, 2010; Pierce, Hamm, & Vandell, 1999). Research on mother-child closeness and school adjustment provides a more mixed picture. Some studies find that close mother-child relationships are associated with better academic performance (Simpkins et al., 2006), more social competence with peers (Contreras, et al., 2000), and fewer behavioral problems (Criss, Shaw, & Ingoldsby, 2003). Findings from other studies, however, suggest that mother-child relational closeness is related to concurrent but not necessarily longitudinal adjustment at school (e.g., Heatly & Votruba-Drzal, 2017; Zhang, 2011).

Pianta (1999) theorized that negative or conflictual qualities of adult-child relationships are also consequential for children's adjustment. Conflictual relationships between children and key adult caregivers are marked by a lack of contingency, frustration, and anger. Conflicts can reduce smooth communication and interactions between adults and children and interfere with

the development of basic school-related skills including attention regulation, adaptive coping, and prosocial reasoning (Pianta et al., 2003; Wentzel, 2003).

Extant literature documents the adverse implications of conflictual relationships between children and key adults. Specifically, conflictual relationships between children and teachers are associated with lower academic competence (Buyse et al., 2009; Hamre & Pianta, 2001), poor work habits and classroom engagement (Hamre & Pianta, 2001; Stipek & Miles, 2008; Yang & Lamb, 2014), and elevated aggressive behaviors towards peers (Buyse et al., 2009; Rudasill, Niehaus, Buhs, & White, 2013). Compared with teacher-child conflict, fewer scholars have examined how adult-child conflict outside of school is related to children's adjustment at school. Nevertheless, this limited research finds that negative relationships with afterschool staff and mothers are adversely related to children's academic performance (Pierce et al., 1999; Simpkins et al., 2006), and social competency with peers at school (Criss et al., 2003; Lindsey, MacKinnon-Lewis, Campbell, Frabutt, & Lamb, 2002). Furthermore, when closeness and conflict are examined simultaneously, conflictual relationships are consistently linked to poorer academic, social emotional, and behavioral outcomes whereas closeness is not consistently related to children's adjustment at school (Buyse et al., 2009; Hamre & Pianta, 2001).

Children's Relationships with Multiple Adults

While previous studies illustrate that each adult-child relationship is associated with children's adjustment in elementary school, the literature on these three relationships has largely developed independently (e.g., Contreras, et al., 2000; Hamre & Pianta, 2001; Pierce et al., 2010). No study to our knowledge has simultaneously examined children's relationships with all three key adults in relation to their adjustment at school. A few researchers have examined teacher- and mother-child relationships simultaneously to investigate their unique associations

with children's adjustment. In one study, parent-child and teacher-child relatedness are uniquely associated with children's school engagement (Furrer and Skinner, 2003), which aligns with the separate literature on each relationship. However, other studies have found that only teacher-child relationship is associated with children's adjustment when both teacher-child and mother-child relationships are considered (Heatly & Votruba-Drzal, 2017; Silver, Measelle, Armstrong, & Essex, 2010). For instance, Heatly and Votruba-Drzal (2017) simultaneously examined children's closeness and conflict with teachers and mothers, finding that teacher-child conflict in 1st grade was associated with children's concurrent school engagement whereas mother-child relationship quality was not linked to children's school engagement. These findings suggest that mother-child relationships may not be related to children's school adjustment above and beyond teacher-child relationships. More work is needed to parse out these contradictory patterns and to also account for afterschool staff-child relationships.

As elementary school children spend substantial time in organized educational contexts including schools and afterschool programs, their relationships with adults in these contexts are expected to play an important role in shaping their adjustment in the school setting (Collins, Madsen, & Susman-Stillman, 2002). It is not clear if mother-child relationships are associated with children's school adjustment above and beyond adult-child relationships in schools and afterschool programs, as mother-child interactions are more removed from organized educational settings compared with adult-child interactions in the other two settings. In addition, though researchers find that staff-child relationships are associated with children's school adjustment when examined alone (Vandell et al., 2005; Vandell & Posner, 1999), no research to our knowledge has examined the relative importance of afterschool experiences within the broader ecology of child development. One must examine adult-child relationships across multiple

microsystems to understand if adult-child relationships in a specific setting are uniquely associated with children's school adjustment beyond relationships with other adults. The Heatly and Votruba-Drzal (2017) study is one of the closest to address these aims. As noted earlier, they examined the relations between teacher-child and mother-child closeness and conflict in 1st grade and children's concurrent adjustment (in 1st grade) with the NICHD SECCYD data, which are the same data utilized in this study. The current study extends this work by also examining afterschool staff-child relationships and the differences in quality across these three adult-child relationships. Moreover, we examined the extent to which these relations were associated with children's school adjustment in the following year while controlling for prior adjustment.

Current Study

Guided by bioecological theory of development, we simultaneously examined children's relationships with classroom teachers, afterschool program staff, and mothers in 1st grade and their associations with children's adjustment at school in 2nd grade. We had two main research goals in the current study. First, we compared the extent to which certain relationships were characterized as having higher or lower closeness and conflict. We expected that adults in these three settings would experience differential levels of closeness and conflict with the same child. Compared with classroom teachers and afterschool program staff, mothers interact with children in a wider number of circumstances over a longer period of time, providing more opportunities for both positive and negative interactions (Collins, Harris, & Susman, 1995). As a result, it is expected that mothers would report more closeness *and* more conflict in their relationships with their children than reported by teachers and afterschool program staff.

Second, we examined the extent to which closeness and conflict between children and these three adults in 1st grade were related to children's adjustment at school the following year

in 2nd grade. Based on prior empirical research suggesting differential implications of close and conflictual relationships on child development (Hamre & Pianta, 2001; Heatly & Votruba-Drzal, 2017), we hypothesized that conflict with adult caregivers would be particularly relevant for children's problematic adjustment. In addition, prior work on the unique predictive value of teacher-child and mother-child relationships suggests that the association between mother-child relationships and children's school adjustment wains when relationships with teachers and afterschool staff are taken into account.

Method

Participants

Data for the current study were taken from the NICHD Study of Early Child Care and Youth Development (SECCYD), a longitudinal study of a birth cohort of 1,364 children (52% male) and their families from 10 locations across the U.S. For a full discussion of the NICHD SECCYD sampling design, see NICHD Early Child Care Research Network (2005).

When study children were in 1st grade, the SECCYD investigators purposely selected a subsample of children who attended afterschool programs. Through interviews with mothers, the investigators identified all children (n = 137) in the full sample who attended five-day-a-week afterschool programs located in either school or community settings when they were in 1st grade. The SECCYD researchers then contacted and surveyed the afterschool program staff who took the main responsibility of caring for the study child at the program. The multi-informant data on these children used in the current study were reported by children's primary classroom teachers, afterschool program staff, and mothers when children were in 1st grade. Classroom teachers in 2nd grade reported children's adjustment at school.

This sample of 137 children who regularly attended afterschool programs was evenly divided between males and females (51% female) and the majority (80%) were White (Table 3.1). The average years of mother education was 15 years, with 51% of the mothers having a college degree. This sample of children who regularly attended afterschool programs did not differ from the larger study sample on key characteristics, including gender, ethnic majority/minority status, 2-parent households, children's relationships with teachers and mothers in 1st grade, and prior academic achievement and social competence (see Table 3.1). However, children in the afterschool sample came from families that had higher level of maternal education (d = .42) and higher family income (d = .36) compared to mothers in the sample as a whole, which aligns with prior patterns on who is more likely to attend afterschool programs in previous research (Vandell et al., 2015).

Measures

To address the two research aims in the current study, we used data collected from classroom teachers, afterschool staff, and mothers. Detailed information on key variables is presented below. Items included in each measure are presented in Appendix Table 3.1.

Adult-child relationship quality in 1st grade. In the spring of 1st grade, classroom teachers, afterschool staff, and mothers reported the quality of their relationship with the study child using an adapted version of the Student-Teacher Relationship Scale (Pianta, 1992). Specifically, the scales consisted of the same set of items that were adapted for each adult caregiver. *Closeness* captured shared affection, warmth, and open communication between adult and child (7 items; e.g., "Study child spontaneously shares information about himself/herself"; "I share an affectionate, warm relationship with study child"; 1 = *Definitely does not apply*, 5 = *Definitely applies*). The closeness scale originally had 8 items but one reverse coded item on

physical affection (i.e., "Study child is uncomfortable with physical affection or touch from me") was dropped to improve reliability. *Conflict* captured lack of contingency, negativity, and struggle between adult and child (7 items; e.g., "Study child and I always seem to be struggling with each other"; "Study child is sneaky or manipulative with me"; 1 = *Definitely does not apply*, 5 = *Definitely applies*). Items on the relationship scale showed high reliability for both closeness and conflict (closeness: 7 items; α = .87, .86, .79; conflict: 7 items; α = .86, .88, .82, for teachers, afterschool staff, and mothers respectively). For each adult (i.e., teachers, afterschool staff, and mothers), composite scores were created for the closeness and conflict subscales by taking the mean of all items on each subscale, such that higher scores represented more closeness or conflict. Previous research has offered evidence of validity for teacher and mother versions of these scales (Driscoll & Pianta 2011; McCormick, O'Connor, & Horn, 2017). Past work also has demonstrated validity through associations with children's functioning in the social and behavioral domains including social competency and externalizing behaviors (Driscoll & Pianta 2011; Hamre & Pianta, 2001; Weaver et al., 2015; Zhang, 2011).

Confirmatory factor analyses with the current sample confirmed that the items loaded well onto the two constructs of closeness and conflict for teachers, afterschool staff, and mothers (factor loadings > .40). In addition, model fit indices also suggested good model fit for all three adult caregivers ($X^2(71) = 131.63$, $p < .001$; CFI/TLI = .931/.912; RMSEA = .081 for teachers; $X^2(69) = 93.12$, $p = .028$; CFI/TLI = .972/.963; RMSEA = .051 for afterschool staff; $X^2(70) = 84.10$, $p = .120$; CFI/TLI = .977/.970; RMSEA = .039 for mothers). We also tested measurement invariance on closeness and conflict to ensure that each scale had similar meaning for the three adult caregivers. Each scale evidenced partial strong invariance; detailed information is presented in Appendix Tables 3.2 and 3.3.

Children's adjustment at school in 2nd grade. Classroom teachers reported children's academic performance, work habits, social skills, and externalizing behaviors in the spring of 2nd grade. The 2nd grade teachers reporting children's outcomes were different than the classroom teachers who reported teacher-child relationships in 1st grade.

Children's *academic performance* and *work habits* were measured using the Mock Report Card (Pierce, Hamm, & Vandell, 1999). Academic performance was rated using 5-point scales (1 = *Below grade level*, 5 = *Excellent*) in six subject areas: reading, oral language, written language, math, social studies, and science. A composite score of academic performance was created by taking the mean score across the six subject areas (α = .92). *Work habits* measured children's work behaviors in the classroom (6 items; α = .95; e.g., "Study child works well independently"; "Study child keeps material organized"; 1 = *Very Poor*, 5 = *Very Good*). A composite score on work habits was created by taking the mean score across all items in the subscale.

Children's social skills were measured using teacher report of The Social Skills Rating Scale (SSRS) (Gresham & Elliott, 1990) that included three subscales: cooperation, assertion, and social self-control. Items on each subscale were measured on a 3-point scale (0 = *Never*, 1 = *Sometimes*; 2 = *Very Often*). *Cooperatio*n included items such as paying attention to the teacher's instruction and putting away work materials properly (10 items; α = .88). *Assertion* included items such as starting conversations with peers, introducing oneself, and volunteering to help peers with classroom tasks (10 items; α = .86). *Social self-control* included items that focus on how children handle conflicts, such as responding to teasing or peer pressure appropriately, receiving criticisms well, and controlling one's temper (10 items; α = .89). Items within each

subscale were averaged to create a composite score on each dimension of cooperation, assertion, and social self-control. Higher scores indicated stronger social skills on the specific dimension.

Children's *externalizing behaviors* were measured using the Teacher Report Form of the Child Behavior Checklist (Achenbach, 1991). For each item, the teacher reported how well the item described the target child currently or within the last two months on 3-point scales (0 = *Not true*, 1 = *Somewhat or sometimes true*, 2 = *Very true*). *Externalizing behaviors* were assessed by 34 items (α = .93). Raw scores were standardized to create T-scores for externalizing behaviors, with a higher score indicating a greater affinity to display delinquent and aggressive behaviors.

Covariates. Omitted variable bias is well documented in the literature as children's family background as well as prior adjustment can both be associated with their relationships with adult caregivers and their adjustment in school. For example, it is well documented in the literature that background characteristics such as gender, maternal education, and race/ethnicity are associated with children's relationships with adults (Jerome et al., 2009) as well as their academic achievement, social and behavioral functioning (Ewing & Taylor, 2009; Miner & Clarke-Stewart, 2008; Pigott & Cowen, 2000). In addition, children's functioning at earlier time points also predicts their subsequent relationships with adult caregivers and their own adjustment (Collins et al., 2017; Hamre & Pianta, 2001; Heatly & Votruba-Drzal, 2017; Jerome et al., 2009). In order to control for potential omitted variable biases, a range of family- and child-level background indicators were included as covariates in the current study. Background characteristics included child gender (male as reference group), ethnic minority status (White as reference group), and years of mother's education (M = 15.18, SD = 2.54; Min = 10, Max = 21). Children's academic achievement was measured with Woodcock-Johnson Psycho-Educational Battery-Revised at 54 months, including memory for sentences, incomplete words, picture

vocabulary, letter-word Identification, and applied problems. A composite standardized score on Woodcock-Johnson was created to indicate children's academic achievement ($\alpha = .81$). Caregiver-reported social competency in child care at age 54 months was used as indicator of early social skills ($\alpha = .89$; California Preschool Social Competency Scale; Ladd, & Price, 1987).

Missing Data

Among the 137 children who attended afterschool programs, 117 (85%) children had complete data on all adult-child relationships in 1st grade and school adjustment in 2nd grade. No significant differences were found between participants with complete and with missing data on ethnic majority/minority status ($X^2(1) = 3.05$, $p = .08$, $V = .15$) or maternal education ($t(135) = 1.29$, $p = .20$, $d = .30$), teacher-child closeness ($t(130) = 1.12$, $p = .27$, $d = .29$) and conflict ($t(130) = 1.04$, $p = .30$, $d = .25$), staff-child closeness ($t(135) = .22$, $p = .82$, $d = .05$) and conflict ($t(135) = .14$, $p = .89$, $d = .03$), and mother-child closeness ($t(132) = .68$, $p = .50$, $d = .16$), and conflict ($t(132) = 1.15$, $p = .25$, $d = .29$) in 1st grade. However, there were more females with complete data ($X^2(1) = 4.17$, $p = .04$, $V = .17$). To control for potential biases caused by missing data, multiple imputation was used to handle missing data in the current sample ($n = 137$). Following imputation procedures recommended by Enders (2010), we imputed 30 datasets where relationship variables, outcome variables, and covariates were all imputed using multiple chained equations. Imputed datasets were then used in the analyses addressing both research questions.

Plan of Analysis

The first aim of the current study was to compare the level of closeness and conflict across children's relationships with teachers, afterschool staff, and mothers. In order to address this aim, we conducted separate mixed effects regression analysis in STATA 14.0 for closeness and conflict on the imputed data to examine if the level of closeness and conflict differed across

teachers, afterschool staff, and mothers. In both models, family- and child-level covariates consisting of child gender, ethnic minority status, maternal education, and children's prior adjustment were included. Following the regression analyses, pairwise mean difference tests were conducted to examine if the level of closeness and conflict were different across adult caregivers.

The second study aim was to assess the unique associations between children's relationships with teachers, afterschool staff, and mothers in 1st grade and their adjustment at school in 2nd grade as reported by their classroom teachers. To address this aim, path analysis model was estimated in M*plus* 8. In the path analysis model, children's relationships with teachers, afterschool staff, and mothers were simultaneously included to examine the unique associations between each relationship indicator and children's adjustment in 2nd grade (see Figure 3.1 for conceptual model). In the path model, family- and child-level covariates consisting of child gender, ethnic minority status, maternal education, and children's prior adjustment were included. All variables were standardized before being included in the path analysis so the regression coefficients can be interpreted as effect sizes in which a one standard deviation change in an independent variable is associated with a one standard deviation change in a dependent variable. Results from post-hoc power analysis suggested that with the sample size (n = 137), we were able to detect associations at or larger than r = 0.24 with a power of 0.80 at alpha level of 0.05.

In order to check the robustness of our findings on associations between child-adult relationships and school adjustment, we conducted two sets of additional analyses using path models in M*plus*. In the first robustness check, we reran the path model on 30 imputed datasets that did not impute outcome variables as there is debate about whether imputing missing data on

the outcomes biases the analyses in longitudinal studies (Young & Johnson, 2015). In the second robustness check, we ran a separate path model for each adult caregiver. Specifically, teachers, afterschool staff, and mothers were examined in separate path models to examine if significant associations in the joint model were retained.

Results

Descriptive Statistics

Means, standard deviations, and bivariate correlations for key variables are presented in Table 3.2. Teachers, afterschool staff, and mothers, on average, reported high levels of closeness (M = 4.34, 4.13, and 4.76 respectively) and low levels of conflict with children (M = 1.56, 1.52, and 2.07 on a 1-5 scale). As indicated by the bivariate correlations in Table 3.2, teacher-child closeness in 1st grade was positively related to children's assertion (r = .18, p < .05) in 2nd grade. Teacher-child conflict in 1st grade was associated with lower academic performance (r = -.24, p < .01), lower scores on work habits (r = -.38, p < .001), lower cooperation and social self-control (r's = -.31 and -.30, p < .01) as well as more externalizing behaviors (r = .33, p < .001) in 2nd grade. Staff-child conflict in 1st grade was related to lower academic performance (r = -.21, p < .05), lower work habits (r = -.24, p < .01), lower social self-control (r = -.37, p < .001), and more externalizing behaviors (r = .35, p < .001) in 2nd grade. The only significant associations between mother-child relationship in 1st grade and children's school adjustment in 2nd grade was between mother-child closeness and assertion as well as social self-control (r's = .18 & .20, p < .05).

Variation in Adult-Child Relationships

The first study aim was to examine if levels of closeness and conflict differed across children's relationships with teachers, afterschool staff, and mothers. Results of the regression

tests are presented in Table 3.3. As expected, there were significant differences across the three adults' reports of closeness (b = .212, p < .001) and conflict (b = .249, p < .001). Results from pairwise difference tests showed that mother-child closeness (95% CI = 4.66 – 4.86) was significantly higher than teacher-child closeness (95% CI = 4.24 – 4.44), which in turn, was higher than staff-child closeness (95% CI = 4.03 – 4.23). In addition, mother-child conflict (95% CI = 1.94 – 2.18) was higher than teacher-child and staff-child conflict (95% CI's = 1.44 – 1.68, 1.40 – 1.64 respectively). Both of these findings supported our hypothesis that mother-child relationship would evidence higher closeness and conflict than teacher-child and staff-child relationships.

Associations between Adult-Child Relationships in 1st Grade and Children's Adjustment at School in 2nd Grade

The second study aim was to examine the unique associations between children's relationships with teachers, afterschool staff, and mothers in 1st grade and children's adjustment in 2nd grade classroom. Path model results are presented in Table 3.4. When adult-child relationships with all three adults were examined simultaneously, children's conflictual relationships with teachers and afterschool staff in 1st grade were both associated with poorer child adjustment in 2nd grade. Specifically, teacher-child conflict in 1st grade was associated with poorer work habits (β = -.312, SE = .110, p = .004) and less cooperation (β = -.282, SE = .115, p = .014) in 2nd grade. In addition, children's conflict with afterschool staff in 1st grade was associated with lower social self-control (β = -.356, SE = .089, p < .001) and more externalizing behaviors in 2nd grade (β = .306, SE = .093, p = .001). There were several associations that were statistically significant in the bivariate correlations that were no longer statistically significant in the model taking into account all three relationships and the covariates. For example, mother-

child closeness was associated with more assertion (r = .18, p < .05) and social self-control (r = .20, p < .05) in the bivariate correlations (see Table 3.2), but mother-child closeness was not related to teacher reported children's adjustment in 2nd grade classrooms when we included children's relationships with teachers and afterschool staff and a range of family and child covariates. In sum, our hypothesis for the relations between teacher-child and staff-child conflict and children's subsequent adjustment were supported in the bivariate correlations and partially supported in the multivariate model. Our hypothesis for closeness of any relationship and mother-child conflict and children's subsequent adjustment were largely not supported in either the correlations or the multivariate model.

Robustness Check

In our first robustness check analysis, we reran the path model on 30 imputed datasets that did not impute the outcome variables. Results from this analysis are presented in Appendix Table 3.4. Consistent with our findings from the main analysis, teacher-child conflict in 1st grade was associated with poorer work habits (β = -.299, SE = .112, p = .007) and less cooperation (β = -.268, SE = .113, p = .018) in 2nd grade. In addition, children's conflict with afterschool staff in 1st grade was associated with lower social self-control (β = -.349, SE = .091, p < .001) and more externalizing behaviors in 2nd grade (β = .299, SE = .094, p = .001). Similar to what we found in the main analysis, the statistically significant bivariate correlations between mother-child relationship and school adjustment were not retained in the multivariate path model.

In our second robustness check analysis, children's relationships with each adult caregiver were examined in a separate path model to examine if significant associations in the joint model were retained. Three path models were estimated. Results from this analysis are presented in Appendix Table 3.5. All statistically significant associations in the joint path model

were statistically significant in the separate models. In addition, three relations that were not statistically significant in the joint path model in the main analyses were statistically significant in these models that were specific to each relationship. Teacher-child conflict was associated with lower social self-control (β = -.241, *SE* = .100, p = .017) and more externalizing behaviors (β = .325, *SE* = .099, p = .001); staff-child closeness was associated with more externalizing behaviors (β = .219, *SE* = .081, p = .007).

Discussion

Guided by bioecological theory of development (Bronfenbrenner & Morris, 2006) and Pianta's (1999) theorizing of adult-child relationships, the current study examined the quality of children's relationships with classroom teachers, afterschool program staff, and mothers in 1st grade and their associations with children's school adjustment the following year in 2nd grade. First, we examined the variation in children's closeness and conflict with all three key adult caregivers in 1st grade. Second, we assessed the unique associations between closeness and conflict with these three key adults in 1st grade and children's academic, social emotional, and behavioral adjustment a year later when children were in 2nd grade, while controlling for a range of child and family characteristics. Our key findings were as follows: there were lower levels of closeness and conflict in teacher- and staff-child relationships compared with mother-child relationships. When adult-child relationships were examined in the same model, our hypotheses were partially supported such that 1st grade teacher-child conflict was associated with lower scores on work habits and cooperation in 2nd grade. In addition, staff-child conflict in 1st grade was associated with lower social self-control and more externalizing behaviors in the next school year.

Variation in Children's Relationships with Key Adults

As expected, children's relationships with classroom teachers, afterschool staff, and mothers differed in both closeness and conflict. Specifically, the highest level of closeness was between children and mothers, followed by teachers, and then afterschool staff. In addition, there were higher levels of conflict between children and mothers than between children and teachers or afterschool staff. Although previous research suggests that mother-child relationships provide a foundation for adult-child relationships in other settings (e.g., O'Connor, 2010), findings from the current study suggest that children's relationships with adults from different developmental settings are somewhat unique and context-specific. As is documented in the literature (Collins et al., 1995), compared with teachers and afterschool program staff, mothers and children interact over a longer time across a wider range of activities, which provides more opportunities for closeness and conflict. In addition, we found that children's relationships with adults in more formal educational settings, including school and afterschool programs, are more similar than mother-child relationships in terms of relationship quality. In both school and afterschool programs, adult-child interactions are embedded in organized, structured settings, where adults are the authority figures implementing clear rules in group-based settings. It is possible that children would behave more similarly in these settings than in familial settings.

Associations between Adult-Child Relationships in 1st Grade and Children's Adjustment at School in 2nd Grade

Aligning with previous research on teacher-child relationships (Buyse et al., 2009; Hamre & Pianta, 2001; Heatly &Votruba-Drzal, 2017; Lee & Bierman, 2018; Rudasill et al., 2013), the current study found that children's relationships with their 1st grade classroom teachers were related to their work habits and cooperative behaviors at school one year later when they were in another teacher's class. It is likely that children who share conflictual relationships with their

teachers in 1st grade are at greater risk of developing negative learning behaviors, which they may carry to future classrooms. In contrast, we did not find statistically significant associations between teacher-child relationships and children's academic performance in the following year. The null findings on academic outcomes may be due to the small sample size and the lack of statistical power to detect associations that are smaller in size. However, previous research has also documented less consistent associations with teacher-child relationships in the academic domain than in the social and behavioral domains (e.g., Baker, 2006; Buyse et al., 2009). Nevertheless, this lack of findings does not mean that teacher-child relationships are not important for children's academic performance, as conflictual relationships may adversely impact teachers' use of effective instructional practices in the classroom (White, 2013).

Conflict with afterschool program staff in 1st grade was also associated with lower social self-control and higher externalizing behaviors toward peers at school in 2nd grade. Although we were not able to explore possible mechanisms underlying the associations between relationships with afterschool program staff and children's adjustment in school, previous research on afterschool programs provide some potential explanations. Specifically, researchers find that children's relationships with adult staff in afterschool programs can influence children's fundamental social emotional skills that can be easily transferred to classrooms (Larson & Brown, 2007; Smith, Akiva, McGovern, & Peck, 2014; Vandell et al., 2005). Extending the existing literature, the current study provides evidence of the unique role staff-child relationships may play in promoting children's school adjustment by taking into account children's relationships with teachers and mothers. Together with previous research (Pierce et al., 1999; Pierce et al., 2010), the current study suggests that different developmental settings are

interrelated in a way such that children's relationships with staff in afterschool programs have important implications for their adjustment at school (Bronfenbrenner & Morris, 2006).

Different from some previous studies (Pierce et al., 1999; Pierce et al., 2000), we did not find associations between staff-child relationships and children's academic performance in school in the following year. This may be due to the fact that the current study examined those associations longitudinally after controlling for other adult-child relationships, children's prior adjustment, and a host of family characteristics. As can be seen from the bivariate correlation table, staff-child relationships in 1st grade were associated with children's academic performance and work habits in 2nd grade. However, these links disappeared once we controlled for children's prior adjustment and family characteristics in the regression model.

With both classroom teachers and afterschool program staff, conflict was related to children's school adjustment. Consistent with previous research (Hambre & Pianta, 2001; Heatly &Votruba-Drzal, 2017), the current study emphasizes the potential negative implications of adult-child conflict on social emotional and behavioral adjustment (Buyse et al., 2009; Hambre & Pianta, 2001; Lee & Bierman, 2018; Silver et al., 2010). As indicated by developmental theory, children's relationships with key adults in proximal settings lay the foundation for the development of basic social emotional skills such as attentional regulation and self-control (Pianta, 1999). When adults share a conflictual relationship with children, they may use less than optimal socialization strategies when interacting with children. Conflictual relationships between adults and children will also decrease adults' positive modelling of self-regulation skills that are critical for adaptive social and behavioral functioning in school.

In contrast to our findings on conflict, closeness with teachers, afterschool staff, and mothers in 1st grade was not associated with any indicator of children's school adjustment in 2nd

grade. These null findings with closeness is surprising in one respect because developmental theory (Pianta, 1999) describes the importance of closeness for children's development. However, previous empirical research that simultaneously examines both closeness and conflict also has found more consistent associations between conflict compared with closeness (Buyse et al., 2009; Hamre & Pianta, 2001; Heatly & Votruba-Drzal, 2017). One explanation of the differential associations is that among community or low-risk samples, conflict with others stands out more as a stressor that can adversely impact children's development. Another possible explanation is that teachers, afterschool staff, and mothers generally reported high levels of relational closeness in the current study. The relatively small variation on the closeness measure also might have limited our ability to find significant associations between this variable and children's school adjustment.

Findings from the current study have important implications for researchers, educators, parents, and policy makers. Though often absent from the literature, children's relationships with afterschool staff are meaningful for children's social emotional and behavioral adjustment in school. These relationships play a role above and beyond teacher-child relationships in the classroom. Therefore, when researchers think about social processes associated with children's adjustment in school, they should not only attend to proximal processes within the classroom. Instead, children's relationships with adults from afterschool programs and the linkages between afterschool programs and classrooms should be considered. Specifically, classroom teachers and afterschool programs staff can work together to create a "system" or "ecology" to promote children's adjustment.

Although mother-child closeness in 1st grade was related to children's having high assertion score and social self-control in 2nd grade in the bivariate correlations, the current study

did not find statistically significant associations between mother-child relationships and children's adjustment after we controlled for children's relationships with the other two adult caregivers and a host of family and child characteristics. There are multiple potential explanations for the null findings in the current study. First, from a developmental perspective, the need for supportive relationships with adults from educational institutions such as school and afterschool programs, become increasingly apparent in elementary school children's school success. For parents of children at this age, their roles are geared more towards facilitating children's lives in school. To achieve these specific goals, parents should engage in more school-related behaviors such as homework help and communicating educational expectations that align well with requirements in school (Collins et al., 2002). Though we measured overall relationship quality shared between mothers and children in the current study, parents' school-related behaviors may play a more salient role in children's school adjustment (El Nokali, Bachman, & Votruba-Drzal, 2010; Englund, Luckner, Whaley, & Egeland, 2004). Second, the sample in the current study was relatively small, which may have limited our ability to detect an association between mother-child relationships and children's school adjustment. Third, though children's relationships with mothers were not directly associated with school adjustment, it does not mean that these relationships are not important. Previous research indicates that parent-child relationships can predict children's school adjustment through its impact on the relationships children build in school (e.g., Heatly & Votruba-Drzal, 2017; O'Connor, 2010).

Limitation and Future Directions

The current study used data from a subsample of NICHD-SECCYD dataset who attended formal five-day-a-week afterschool programs. This subsample was representative of the recruited sample in terms of gender, ethnic distribution, and a range of background characteristics.

However, the subsample had higher maternal education and family incomes than the larger NICHD-SECCYD sample. The homogeneity of the analytic sample limits our ability to generalize the findings in the current study to a more diverse populations. For example, although we did not find associations between closeness and children's school adjustment in the current study, such associations could be observed in a different sample. Previous studies found that the presence of close relationships with adults can function as a protective factor in preventing developmental problems for children at greater risk for maladjustment (e.g., Meehan, Hughes, & Cavell, 2003).

Another limitation posed by the sample in the current study is that we could only focus on a relatively small sample of children who attended 5-day-a-week afterschool programs. With the sample size (n =137), we were able to detect associations at or larger than r = 0.24 with a power of 0.80 at alpha level of 0.05. This small sample size might have limited our ability to detect small effects that could have been detected in a larger sample. Nevertheless, even with a relatively small sample, our findings are consistent with previous research highlighting the negative implications of relational conflict between children and key adult caregivers (e.g., Hamre & Pianta, 2001; Heatly & Votruba-Drzal, 2017).

The current study is one of the first to explore the issue of interrelatedness across developmental settings by simultaneously examining children's relationships with classroom teachers, afterschool staff, and mothers. We found the presence of interrelatedness such that staff-child relationships were associated with children's school adjustment in the following year. However, limited by data, we were not able to explore how connections are built across settings. As indicated by qualitative research studying older youth, the presence of a connection between school and afterschool programs can make a real difference in youth's development (Hirsch,

2005). Considering the importance of children's experiences in organized afterschool programs, it would be of great value to examine how connections are built between afterschool programs and schools in promoting children's development.

Conclusion

Using the bioecological systems theory (Bronfenbrenner & Morris, 2006), the current study examined adult-child relationships in 1st grade in relation to children's school adjustment in 2nd grade classrooms, controlling for family background and children's prior adjustment. Aligning with previous studies examining teacher-child relationships, we found that teacher-child conflict was particularly problematic for children's development of social emotional competences. In addition, the findings suggest that staff-child conflictual relationships in afterschool programs may also interrupt the process of positive adjustment in school. We did not find closeness with teachers or afterschool staff to be positively linked to later school adjustment. Also, consistent with some other studies, we found the quality of children's relationships with their mothers to be less related to later adjustment at school.

Findings from the current study support the idea that children develop within interrelated contexts, such that relational processes in afterschool programs have important implications for their adjustment in school. Although educators and researchers may not have considered the role of afterschool programs together with traditional school settings, it is time that stakeholders from schools and afterschool programs communicate with each other to create a system/ecology of positive child development. For both parents and afterschool program providers, findings from the current study highlight the importance of providing high quality experiences in afterschool programs. Afterschool programs are not just place for fun. The quality of relationships children experience in these settings have important implications for their development in other settings.

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Table 3.1
Participant Information

	Afterschool program sample[a]		Recruitment sample		Difference	Effect size
	Mean (%)	*SD*	Mean (%)	*SD*	*p-value*	
N	137		1364			
Female	51%		48%		.49	.02[b]
Ethnicity						
White	80%		76%		.36	.02[b]
Black	9%		13%		.24	.03[b]
Hispanic	5%		6%		.62	.01[b]
Other	6%		5%		.57	.02[b]
Maternal education	15.18	2.54	14.23	2.51	.00	.42[c]
Double-parent household 6-54 months	.86	.30	.84	.32	.30	.10[c]
Income to needs ratio 6-54months	4.56	3.11	3.60	2.85	.00	.36[c]
Teacher-child closeness	4.34	.65	4.26	.65	.15	.13[c]
Teacher-child conflict	1.56	.72	1.56	.74	.96	.00[c]
Mother-child closeness	4.76	.34	4.76	.32	.89	.01[c]
Mother-child conflict	2.07	.81	2.17	.84	.12	.15[c]
Woodcock-Johnson score 54months	99.89	11.07	98.00	11.86	.05	.19[c]
Social competence 54 months	3.09	.40	3.08	.41	.89	.01[c]

Note. [a]Afterschool program sample included children who attended five-day-a-week organized afterschool programs in 1st grade.
[b]Cramér's *V*: .10 small effect size, .30 moderate effect size, and .50 large effect size.
[c]Cohen's *d*: .20 small effect size, .50 moderate effect size, and .80 large effect size.

Table 3.2
Correlation and Descriptives of Key Variables

		1	2	3	4	5	6	7	8	9	10	11	12
1st Grade relationships													
1.	Teacher-child closeness	-											
2.	Teacher-child conflict	-.17*	-										
3.	Staff-child closeness	.30***	.07	-									
4.	Staff-child conflict	-.18*	.49***	-.19*	-								
5.	Mother-child closeness	.22*	-.18*	.10	-.10	-							
6.	Mother-child conflict	-.07	.26**	-.00	.19*	-.42***	-						
2nd Grade adjustment													
7.	Academic performance	.10	-.24**	.15	-.21*	.02	.05	-					
8.	Work habits	.08	-.38***	.07	-.24**	.15	-.08	.63***	-				
9.	Cooperation	-.01	-.31***	.08	-.14	.11	-.04	.58***	.81***	-			
10.	Assertion	.18*	-.10	.17	-.01	.18*	-.05	.27**	.43***	.48***	-		
11.	Social self-control	-.04	-.30***	.04	-.37***	.20*	-.18	.25**	.46***	.50***	.49***	-	
12.	Externalizing behaviors	.14	.33***	.10	.35***	-.11	.18	-.23*	-.50***	-.52***	-.25**	-.75***	-
	Mean	4.34	1.56	4.13	1.52	4.76	2.07	3.53	3.52	1.56	1.37	1.47	51.82
	SD	0.65	0.72	0.73	0.68	0.34	0.81	0.88	1.08	0.39	0.40	0.39	9.06
	Cronbach's alpha	0.87	0.86	0.86	0.88	0.79	0.82	0.92	0.95	0.88	0.86	0.89	0.93

Note. *p<.05. **p<.01. ***p<.001.

Table 3.3
Variation in Children's Closeness and Conflict with Classroom Teachers, Afterschool Program Staff, and Mothers in 1st Grade

	Mixed effects regression					
	Closeness			Conflict		
	b	*SE*	*p*	b	*SE*	*p*
Adult caregiver (source of report)	.212	.036	.000	.249	.040	.000
Female	.036	.069	.605	-.003	.091	.978
Ethnic minority	-.130	.090	.149	.134	.118	.257
Maternal education	.030	.016	.062	-.022	.021	.301
Woodcock Johnson score (54 month)	.000	.004	.898	-.001	.005	.798
Social competence (54 month)	.082	.091	.371	-.177	.124	.154
	Pairwise comparison					
	Closeness			Conflict		
	Observed mean	Adjusted mean[1] (95% CI)		Observed mean	Adjusted mean[1] (95% CI)	
Teacher-child relationships	4.34	4.24-4.44[a]		1.56	1.44-1.68[a]	
Staff-child relationships	4.13	4.03-4.23[b]		1.52	1.40-1.64[a]	
Mother-child relationships	4.76	4.66-4.86[c]		2.07	1.94-2.18[b]	

Note. [1]Adjusted means are predicted values from regression;
Mixed effects regression was followed with pairwise comparison. Scores with different superscripts are statistically different from each other.

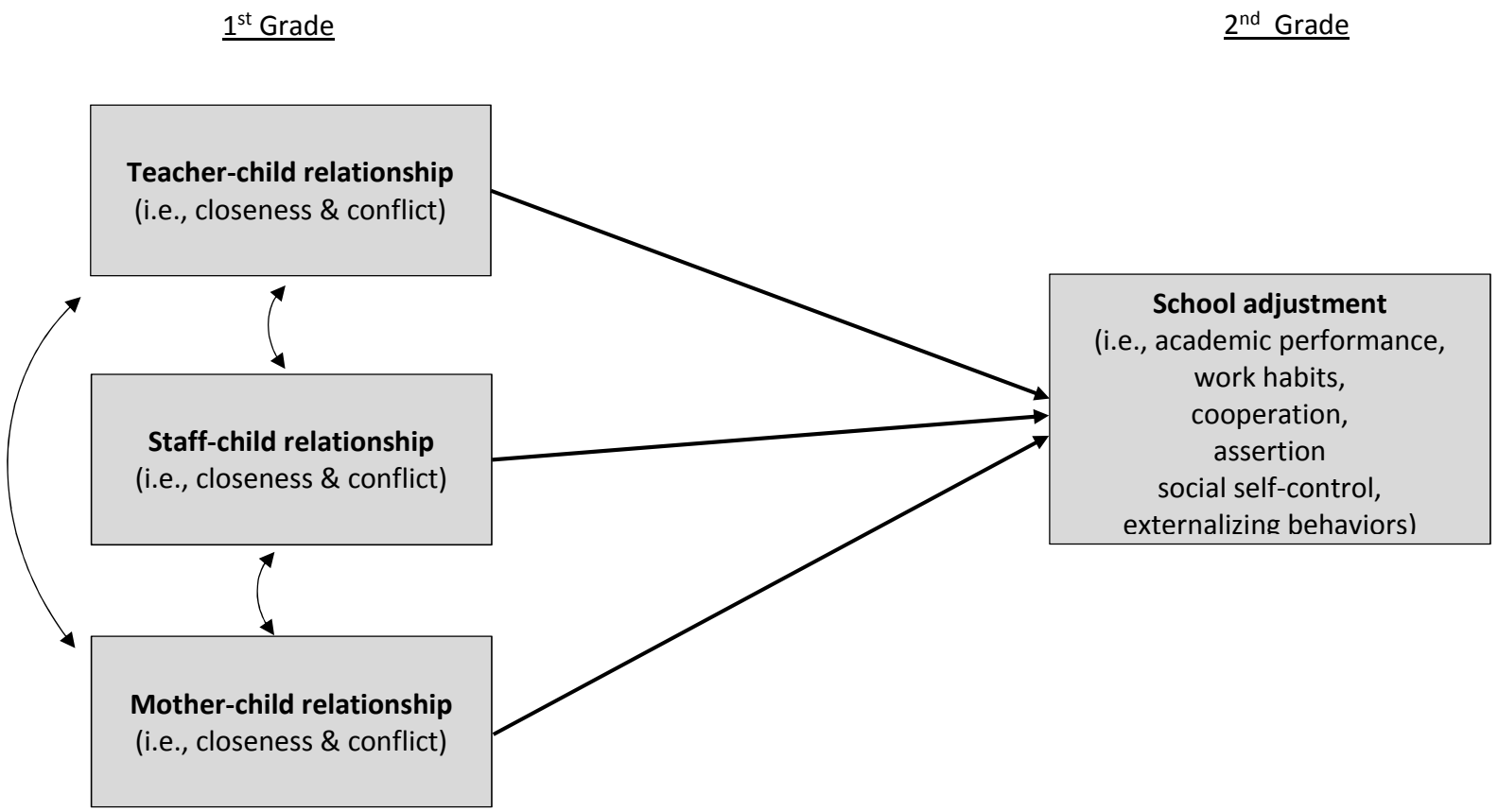
Table 3.4

Children's Relationships with Classroom Teachers, Afterschool Program Staff, and Mothers in 1st Grade Predicting Children's Adjustment at School in 2nd Grade

	Academic performance ß (*SE*)	*p*	Work habits ß (*SE*)	*p*	Cooperation ß (*SE*)	*p*	Assertion ß (*SE*)	*p*	Social self-control ß (*SE*)	*p*	Externalizing behaviors ß (*SE*)	*p*
Adult-child relationships (1st grade)												
Teacher-child closeness	-.050(.082)	.540	-.042(.093)	.649	-.116(.092)	.210	.109(.091)	.233	-.117(.092)	.206	.141(.094)	.134
Teacher-child conflict	-.152(.099)	.126	-.312(.110)**	.004	-.282(.115)*	.014	-.047(.117)	.689	-.046(.113)	.686	.139(.117)	.235
Staff-child closeness	.097(.080)	.225	.046(.088)	.599	.080(.091)	.378	.132(.090)	.143	-.040(.091)	.658	.159(.091)	.080
Staff-child conflict	.004(.088)	.966	-.005(.099)	.958	.098(.098)	.317	.132(.098)	.179	-.356(.089)***	.000	.306(.093)**	.001
Mother-child closeness	.032(.084)	.705	.085(.095)	.369	.056(.093)	.552	.065(.094)	.493	.143(.090)	.113	-.053(.091)	.564
Mother-child conflict	.089(.087)	.305	.024(.097)	.806	.019(.097)	.842	-.013(.096)	.896	-.009(.093)	.925	.020(.094)	.831
Covariates												
Female	.041(.076)	.590	.090(.086)	.296	.056(.086)	.510	-.002(.087)	.977	-.023(.086)	.794	.077(.086)	.368
Ethnic minority	-.089(.079)	.256	-.087(.086)	.307	-.153(.085)	.074	-.044(.086)	.609	-.064(.084)	.445	.138(.086)	.106
Maternal education	.131(.087)	.131	.022(.099)	.823	.135(.099)	.169	.190(.099)	.054	-.011(.094)	.911	-.053(.097)	.584
Woodcock-Johnson score (54	.402(.090)***	.000	.128(.101)	.206	.030(.103)	.773	.045(.099)	.647	.122(.095)	.198	-.095(.098)	.332
Social competence (54 month)	.053(.088)	.546	.169(.103)	.100	.220(.105)*	.036	.162(.101)	.110	.029(.108)	.788	.007(.110)	.950
R^2	.413		.281		.272		.270		.319		.303	

Note. Model fit indices: $X^2(84) = 128.902$, $p = .001$; CFI= .907; SRMR=.073; RMSEA= .062 (90% CI=.040-.083);
Standardized beta coefficients are presented in the table.
*p<.05. **p<.01. ***p<.001.

Figure 3. 1
Conceptual Model of the Relations between Adult-Child Relationships in 1st Grade and Children's School Adjustment in 2nd Grade



Note. Covariates include child gender (male as reference group), ethnic minority status, maternal education, child academic achievement (Woodcock-Johnson score) and social competence at 54 months. Nine dummy variables for data collection sites are also included.

Appendix Table 3.1
Scale Information for Measures Used in the Current Study

Adult-child relationship

Closeness (1 = *definitely does not apply*, 5 = *definitely applies*)

1. I share an affectionate, warm relationship with study child.
2. If upset, study child will seek comfort from me.
3. Study child values his/her relationship with me.
4. Study child is uncomfortable with physical affection or touch from me. (Reverse coded)
5. When I praise study child, he/she beams with pride.
6. Study child spontaneously shares information about himself/herself.
7. It is easy to be in tune with what study child is feeling.
8. Study child openly shares his/her feelings/experiences with me.

Conflict (1 = *definitely does not apply*, 5 = *definitely applies*)

1. Study child and I always seem to be struggling with each other.
2. Study child easily becomes angry with me.
3. Study child remains angry or is resistant after being disciplined.
4. Dealing with study child drains my energy.
5. When study child is in a bad mood, I know we're in for a long and difficult day.
6. Study child's feelings toward me can be unpredictable or can change suddenly.
7. Study child is sneaky or manipulative with me.

Academic performance (1= *below grade level*, 5= *excellent*)

1. Evaluate study child's performance in reading.
2. Evaluate study child's performance in oral language.
3. Evaluate study child's performance in written language.
4. Evaluate study child's performance in math.
5. Evaluate study child's performance in social studies.
6. Evaluate study child's performance in science.

Work habits (1= *very poor*, 5= *very good*)

1. Study child follows class procedures.
2. Study child works well independently.
3. Study child works neatly/carefully.
4. Study child uses time wisely.
5. Study child completes work promptly.
6. Study child keeps material organized.

Cooperation, social confidence, social self-control were measured using The Social Skills Rating Scale (SSRS). Externalizing behaviors were measured by Teacher Report Form of the Child Behavior Checklist. Both measures are copy righted scales and thus are not provided here.

Appendix Table 3.2

Results of Measurement Invariance Test for Closeness

Model tested	$\chi 2$	*df*	*p*	RMSEA	RMSEA 90% CI	CFI
Null model	1350.205	210	<.001	—	—	—
Configural invariance	201.927	154	.006	.048	.027, .065	.96
Weak invariance (full)	238.949	166	<.001	.057	.040, .072	.94
[1]Weak invariance (partial)	222.230	164	.002	.051	.032, .067	.95
Strong invariance (full)	291.112	178	<.001	.068	.054, .082	.90
[2]Strong invariance (partial)	244.703	173	.000	.055	.038, .070	.94

Note. [1]Two out of seven items were not invariant. [2]Three out of seven items were not invariant.

Appendix Table 3.3

Results of Measurement Invariance Test for Conflict

Model tested	$\chi 2$	*df*	*p*	RMSEA	RMSEA 90% CI	CFI
Null model	1487.843	210	<.001	—	—	—
Configural invariance	209.155	159	.005	.048	.028, .065	.96
Weak invariance (full)	247.997	171	<.001	.057	.041, .072	.94
[1]Weak invariance (partial)	225.002	169	.003	.049	.030, .065	.96
Strong invariance (full)	353.225	183	<.001	.082	.069, .095	.87
[2]Strong invariance (partial)	257.119	176	<.001	.058	.042, .073	.94

Note. [1]Two out of seven items were not invariant. [2]Three out of seven items were not invariant.

Appendix Table 3.4

Robustness Check 1-Children's Relationships with Adult Caregivers in 1st Grade Predicting Children's Adjustment at School in 2nd Grade (Not Imputing Outcome Variables)

	Academic performance ß (*SE*)	*p*	Work habits ß (*SE*)	*p*	Cooperation ß (*SE*)	*p*	Assertion ß (*SE*)	*p*	Social self-control ß (*SE*)	*p*	Externalizing behaviors ß (*SE*)	*p*
Adult-child relationships (1st grade)												
Teacher-child closeness	-.047(.086)	.586	-.029(.095)	.758	-.101(.095)	.285	.124(.094)	.187	-.103(.095)	.281	.125(.096)	.193
Teacher-child conflict	-.147(.102)	.149	-.299(.112)**	.007	-.268(.113)*	.018	-.038(.112	.734	-.046(.113)	.683	.128(.114)	.263
Staff-child closeness	.091(.083)	.270	.038(.092)	.680	.076(.093)	.410	.139(.091)	.129	-.037(.090)	.683	.162(.089)	.069
Staff-child conflict	.016(.089)	.857	.004(.099)	.966	.103(.098)	.294	.136(.098)	.164	-.349(.091)***	.000	.299(.094)**	.001
Mother-child closeness	.028(.087)	.750	.079(.096)	.409	.049(.098)	.619	.065(.096)	.502	.145(.092)	.115	-.049(.094)	.599
Mother-child conflict	.101(.089)	.257	.033(.098)	.736	.020(.100)	.839	-.013(.098	.896	-.011(.095)	.904	.018(.096)	.848
Covariates												
Female	.036(.078)	.649	.077(.087)	.379	.049(.088)	.580	-.017(.087	.849	-.031(.085)	.715	.088(.086)	.304
Ethnic minority	-.087(.079)	.271	-.083(.087)	.339	-.146(.087)	.093	-.040(.087	.644	-.061(.084)	.467	.139(.085)	.101
Maternal education	.129(.088)	.144	.025(.099)	.803	.134(.099)	.177	.190(.097)	.050	-.010(.096)	.918	-.060(.097)	.538
Woodcock-Johnson score (54	.414(.089)***	.000	.151(.102)	.140	.057(.103)	.584	.056(.101)	.581	.125(.099)	.204	-.114(.100)	.255
Social competence (54 month)	.066(.090)	.464	.196(.100)	.051	.238(.101)*	.018	.165(.099)	.096	.035(.103)	.738	-.008(.106)	.938

Note. Model fit indices: $X^2(84) = 127.990$, $p = .001$; CFI= .914; SRMR=.074; RMSEA=.062 (90% CI=.039-.083);
Standardized beta coefficients are presented in the table.
*p<.05. **p<.01. ***p<.001.

Appendix Table 3.5

Robustness Check 2-Children's Relationships with Classroom Teachers, Afterschool Program Staff, and Mothers Examined in Separate Models

	Academic performance ß (*SE*)	*p*	Work habits ß (*SE*)	*p*	Cooperation ß (*SE*)	*p*	Assertion ß (*SE*)	*p*	Social self-control ß (*SE*)	*p*	Externalizing behaviors ß (*SE*)	*p*
Teacher-child closeness and conflict model												
Teacher-child closeness	-.014(.077)	.853	-.008(.087)	.929	-.083(.088)	.340	.160(.085)	.060	-.070(.093)	.448	.161(.091)	.078
Teacher-child conflict	-.107(.083)	.197	-.306(.092)**	.001	-.221(.097)*	.023	.029(.098)	.766	-.241(.100)*	.017	.325(.099)**	.001
Covariates												
Female	.065(.072)	.363	.092(.082)	.260	.060(.082)	.468	-.006(.083)	.940	-.032(.086)	.711	.089(.084)	.290
Ethnic minority	-.100(.078)	.200	-.108(.086)	.209	-.167(.085)	.050	-.065(.086)	.450	-.101(.088)	.252	.145(.089)	.102
Maternal education	.148(.086)	.085	.034(.099)	.734	.137(.098)	.162	.188(.098)	.054	.028(.100)	.783	-.071(.100)	.480
Woodcock-Johnson score (54	.411(.089)***	.000	.127(.101)	.209	.042(.103)	.686	.061(.099)	.536	.083(.102)	.415	-.053(.102)	.604
Social competence (54 month)	.055(.088)	.529	.172(.102)	.091	.210(.105)*	.045	.145(.100)	.148	.077(.114)	.502	-.033(.116)	.776
Model fit indices: $X^2(28)= 55.513$, $p = .002$; CFI= .940; SRMR=.067; RMSEA= .085 (90% CI=.051-.117)												
Staff-child closeness and conflict model												
Staff-child closeness	.057(.074)	.439	-.018(.082)	.830	-.002(.084)	.977	.157(.082)	.056	-.071(.083)	.391	.219(.081)**	.007
Staff-child conflict	-.046(.078)	.551	-.148(.087)	.086	-.027(.087)	.755	.091(.087)	.293	-.372(.078)***	.000	.361(.082)***	.000
Covariates												
Female	.074(.071)	.298	.122(.082)	.134	.085(.082)	.300	.000(.083)	.998	-.030(.081)	.707	.072(.081)	.371
Ethnic minority	-.099(.078)	.201	-.120(.086)	.166	-.177(.085)*	.038	-.061(.085)	.476	-.095(.084)	.256	.155(.084)	.066
Maternal education	.144(.086)	.093	.047(.099)	.633	.144(.098)	.139	.209(.096)*	.030	-.008(.092)	.933	-.048(.094)	.607
Woodcock-Johnson score (54	.421(.087)***	.000	.165(.102)	.105	.073(.104)	.483	.037(.098)	.704	.123(.094)	.190	-.118(.096)	.217
Social competence (54 month)	.058(.087)	.506	.180(.101)	.076	.217(.104)*	.037	.180(.099)	.070	.028(.104)	.787	.014(.107)	.894
Model fit indices: $X^2(28)= 31.648$, $p = .289$; CFI= .992; SRMR=.053; RMSEA= .031 (90% CI=.040-.075)												
Mother-child closeness and conflict model												
Mother-child closeness	.029(.081)	.719	.077(.093)	.407	.041(.092)	.658	.105(.093)	.258	.100(.093)	.287	.004(.095)	.965
Mother-child conflict	.047(.082)	.572	-.066(.093)	.480	-.036(.095)	.703	.005(.093)	.959	-.104(.097)	.282	.131(.097)	.177
Covariates												
Female	.071(.073)	.325	.152(.084)	.071	.097(.085)	.253	.001(.088)	.990	.028(.091)	.761	.020(.090)	.828
Ethnic minority	-.103(.078)	.186	-.106(.086)	.217	-.166(.086)	.052	-.046(.087)	.595	-.087(.089)	.332	.153(.091)	.092
Maternal education	.151(.085)	.075	.065(.097)	.507	.146(.096)	.130	.201(.096)*	.037	.041(.098)	.673	-.092(.100)	.357
Woodcock-Johnson score (54	.420(.087)***	.000	.169(.101)	.095	.077(.104)	.457	.057(.099)	.568	.128(.101)	.207	-.105(.104)	.311
Social competence (54 month)	.064(.085)	.451	.198(.100)	.048	.218(.102)*	.033	.156(.099)	.115	.087(.110)	.430	-.051(.115)	.658
Model fit indices: $X^2(28)= 35.387$, $p = .159$; CFI= .983; SRMR=.044; RMSEA= .044 (90% CI=.000-.084)												

Note. Standardized beta coefficients are presented in the table.

*p<.05. **p<.01. ***p<.001

DISCUSSION

Organized afterschool activities present great opportunities for positive youth development (Vandell et al., 2015). With millions of youth participating in those activities, researchers, policy makers, program practitioners, as well as families are interested in learning about the longitudinal associations between activity participation and individual functioning as well as mechanisms underlying such associations (Afterschool Alliance, 2020; Haghighat & Knifsend, 2019; Simpkins, 2015; Vandell et al., 2015). Existing research generally suggests that spending more time in organized afterschool activities is associated with more positive functioning (Vandell et al., 2015). However, the current literature is limited in multiple aspects. First, studies have focused more on the quantity of participation, with much less attention on the quality of experiences in those settings (Kataoka & Vandell, 2013; Viau, Denault, & Poulin, 2015). Second, more work is needed to delineate the mechanisms linking activity participation to individual functioning (Haghighat & Knifsend, 2019; Roth & Brooks-Gunn, 2016; Simpkins, 2015). Finally, organized afterschool activities constitute only one development context. In order to better understand its role in youth's development, experiences in this context should be examined within the broad ecology of development, together with other key developmental contexts, including families and schools. Situated within bioecological theory of human development (Bronfenbrenner & Morris, 1998; 2006), the current dissertation addresses these gaps in the literature by examining the quantity and quality of experiences in organized afterschool activities, and their associations with individual development over time. This dissertation also explores potential developmental pathways underlying those associations, delineating both contextual and individual level processes. Finally, the association between

activity participation and individual development is examined while taking into account individual experiences in other key developmental contexts, including family and school.

Review of Findings

Developmental pathways linking organized activities to individual functioning. The extended time of adolescence and the multiple transitions (i.e., elementary school — middle school — high school) during this developmental period present great opportunity for examining developmental pathways. Study 1 of the current dissertation examined two developmental pathways linking the quantity and quality of organized activities in 6th grade to academic performance at the end of high school: activity participation pathway and individual academic skills pathway. Path analyses results suggested that higher intensity and perceptions of more positive activity experiences in 6th grade were associated with spending more time in organized afterschool activities at age 15, as well as perceptions of more positive experiences in age 15 activities. Activity participation at age 15, in turn, was related to better academic performance at the end of high school. In addition, more intensive participation and perceptions of more positive activity experiences in 6th grade were associated with better academic achievement, and stronger work orientation at age 15, which in turn, functioned as another pathway linking 6th grade activity participation to academic performance at end of high school.

Association between adolescent organized activities and adult leisure activities. Study 2 examined if adolescent afterschool activities were associated with individuals' leisure time activity participation in adulthood. To address this aim, I focused on four types of adolescent activities including sport, art, volunteer/community services, as well as religious youth groups. Across all types of activities, both longer duration and higher levels of enjoyment in adolescent activities was associated with participation in same type leisure activities in adulthood (age 26).

In addition to within-type associations, cross-type associations were also observed among sport, civic and religious activities.

Examining organized activities within multiple microsystems. Study 3 of the dissertation examined if participation in organized activities was associated with individual development after taking into consideration of experiences in other key developmental contexts, including schools and families. Specifically, I examined children's relationships with key adult caregivers in five-day-a-week afterschool programs, schools, and families and their associations with children's school adjustment. Results suggested that more relational conflict with afterschool program staff in 1st grade was associated with lower social self-control and more externalizing behaviors in school one year later. In contrast, relational closeness was not associated with school adjustment in the following year.

Implications

Organized afterschool activities as an important microsystem of development. As over 7.8 millions U.S. youth participate in organized afterschool activities (Afterschool Alliance, 2020), these activities have become an important microsystem of development. However, limited robust research has focused on this context compared to other developmental contexts such as school and family. Across all three studies in this dissertation, I find association between activity participation and positive individual development, including academic competence, social emotional skills, and leisure activity choice in adulthood. Consistent with previous research (Fredricks, 2012; Gardner et al., 2008; Vandell et al., 2015), the current dissertation provides support to the role of organized afterschool activities in promoting positive youth development. It is also important to note that organized afterschool activities turn out to be an important microsystem of development even when it is examined together with other key developmental

contexts including school and family. Findings from the current dissertation have important implications for our understanding of organized afterschool activities in general. Despite their unique role in the promotion of positive youth development, organized afterschool activities are sometimes considered as "caregiving" places and/or "handmaiden" of the school system (Roth & Brooks-Gunn, 2003). Studies from the current dissertation provide robust support to the promise of these activities in promoting individual development. These activities are not just places to spend time outside of regular school hours. Instead, they present rich opportunities for positive development over the life span.

The current dissertation also extends the understanding of the microsystem of organized afterschool activities with its focus on both the *quantity* and *quality* of youth experience in these settings. This more nuanced examination of the microsystem of organized afterschool activities captures important variations among individuals in the intensity, duration, and the nature of their participation. Aligning with bioecological theory (Bronfenbrenner & Morris, 2006), findings from the current dissertation suggest that both the quantity (i.e., intensity and duration) and the quality of experiences in organized afterschool activities matter for continued participation in activities as well as individual development over time (Durlak, Weissberg, & Pachan, 2010; Hirsch, Mekinda, & Stawicki, 2010; Simpkins, 2015). It is recommended that future research on organized afterschool activities and individual development also take into consideration both the quantity and quality of activity experiences to better capture the picture of participation. Findings from the current dissertation also have important implications for practitioners in the activity field. Activities and programs have been working very hard to retain participants and increase attendance. The current dissertation suggests that efforts should be made to improving the quality of youth experiences in these settings, as high quality activity experiences not only help promote

continued participation, but also promote youth thriving. In the next section, I discuss in depth the proximal processes in organized activities.

Proximal processes in organized activities. At the core of bioecological theory is its emphasis on the role of proximal processes in promoting individual development (Bronfenbrenner & Morris, 2006). According to the bioecological theory, the interactions between individuals and their immediate contexts constitute the proximal processes of development. Findings across the three studies in the current dissertation provide support to the importance of the proximal processes in organized afterschool activities and their associations with individual adjustment. It is important to note that the current dissertation measures the proximal processes in organized afterschool activities in multiple ways. Specifically, study 1 measures the overall quality of experiences in organized afterschool, whereas studies 2 and 3 focus on specific quality indicators that are theorized to be more important for the outcomes of interest. These different approaches of measuring activity quality provide insights on when and what quality features matter for development. For example, Study 1 suggests that the overall quality of experiences in 6th grade activities is related to continuous activity participation at age 15. Study 2 further suggests that a sense of enjoyment in adolescent activities is particularly important for leisure activity participation in adulthood. As Simpkins (2015) noted, researchers need to distinguish between overall quality and specific features of activity experiences in order to better understand under what circumstances activity participation has an effect. Moving forward, it would also be helpful to examine the overall quality as well as specific features of the context and the interplay between them (Lynch et al., 2016).

Another contribution of the dissertation is its examination of both positive and negative aspects of quality of experiences in organized activities. In studies 1 and 2, perceptions of more

positive activity experiences were associated with better individual functioning, including academic performance and continued activity participation. In contrast, study 3 examined both the positive and negative relational processes in organized afterschool programs, finding that relational conflict, instead of closeness was associated with individual functioning. These distinct patterns of associations have important implications for how we think about activity quality. When examining quality of experiences in organized afterschool activities, scholars have focused more on the positive aspects and much less work has examined the negative experiences in these settings (Kataoka & Vandell, 2013; Pierce et al., 2010). However, existing research on negative experiences in organized activities and youth mentoring programs suggest that negative experiences with adult leaders and peers can have proportionally more adverse influence on youth (Larson et al., 2005; Rhodes, 2002; Smoll & Smith, 1996). Examination of positive experiences, therefore, only provides limited understanding of the proximal processes in activities, as the presence of positive experiences does not indicate absence of negative experiences. In future research, scholars should take a more nuanced look at the proximal processes in organized activities in order to capture both the positive and negative aspects of youth experiences and their implications for individual development.

Although association between quality of activity experiences and individual functioning is found across all three studies, findings from studies 1 and 3 highlight the important role of the quality of activity experiences in promoting social emotional learning. There is increasing interest among researchers to use organized afterschool activities as a context for social emotional learning (SEL; Durlak et al., 2010). In their seminal meta-analysis of 76 SEL afterschool programs, Durlak and colleagues found that SAFE (i.e., sequenced, active, focused, and explicit) programs were effective in promoting positive youth academic and social emotional

outcomes. Extending prior work, findings from both studies 1 and 3 of the current dissertation suggest that quality of experiences in organized afterschool activities is associated with important social emotional skills, such as positive work orientation, and social self-control. However, different from Durlak and colleagues' work, organized afterschool activities included in the current dissertation are not selected based on their SEL focus. Instead, these activities represent more typical activities participated by children and adolescents. The significant association between quality of experiences in these activities and social emotional skills in the current dissertation suggests that even when programs are not specifically designed for SEL, they still have the potential of improving social and emotional learning. These findings have important implications for program design and the SEL movement in organized afterschool activities (Smith et al., 2016). In addition to intentional SEL instructions, it is likely that the learning of social emotional skills can also be weaved into high quality activity processes, such as supportive staff practices, and positive interpersonal interactions in activities.

Developmental pathways linking organized activities to individual development. In addition to its focus on the proximal processes in organized afterschool activities, the current dissertation also makes effort to open the black box of activity participation through its exploration of potential developmental pathways. Findings on the activity pathway indicates that early participation and positive experiences in organized afterschool activities prepare individuals for future activity participation. The continuous participation in activities overtime functions as sustaining environments that help maintain the positive effects of participation (Nelson, 2017; Vandell, Simpkins, & Liu, 2020). In addition, consistent with bioecological theory of development, individual functioning turns out to be both the outcome of proximal processes and resource for future development (Bronfenbrenner & Morris, 2006).

Current findings on developmental pathways also provide important insights on the mixture of findings in activity literature. Although existing literature generally suggest positive association between activity participation and individual functioning, such association is not always supported across studies (Vandell et al., 2015). Scholars have argued that statistically nonsignificant associations does not always mean lack of effectiveness. Instead, these findings could indicate sleeper effects when measurable effects are not immediately observable (Simpkins, 2015). Findings on the developmental pathways in the current dissertation indicate potential sleeper effects of activity participation on academic performance. Specifically, in study 1, quality of experiences in 6th grade organized activities is not directly associated with academic achievement at age 15. However, it promotes positive work orientation and activity participation at age 15, and changes in these more proximal outcomes improve academic performance at the end of high school. These indirect associations suggest that activity participation in 6th grade still has important implications for academic performance, and these influences build over time.

Findings on these pathways are meaningful for developmental research as they suggest the importance of using longitudinal datasets to examine proximal outcomes as well as intermediate processes. They also provide insights for activity practitioners, policy makers, as well as activity participants. For example, for afterschool activities that have a strong academic focus, funding and enrollment often depends heavily on how effective these activities are in improving test scores or academic grades (Gardner, Roth, & Brooks-Gunn, 2009). However, findings from the current dissertation suggest that these activities may not improve academic scores in a short term if there is a sleeper effect, and this lack of short-term association does not indicate low quality of the activity. It is possible that more immediate outcomes function as pathways linking activity participation to positive longitudinal functioning. When it comes to

program design, activity leaders and staff members should try to include both short- and long-term goals in their curriculum and develop a clear roadmap to achieve these goals.

Future Directions

The current dissertation examines the longitudinal associations between activity participation and individual functioning across developmental periods, including childhood, adolescence as well as adulthood. Potential developmental pathways are also examined using multiple waves of data in adolescence. Future research can extend the current dissertation and examine developmental mechanisms over the life span. For example, Vandell and colleagues (2020) examined organized afterschool activities in middle childhood as a preventive pathway linking early childcare and education to problem behaviors in adulthood. Future research can examine similar issues related to activity participation over a longer time span. It is also important to note that the current dissertation examines two of the many potential developmental pathways that may link activity participation to individual functioning. Previous work in the field of organized activities suggests other pathways such as identity development (Denault & Guay, 2017; Eccles & Barber, 1999), peer processes (Schaefer, Simpkins, Vest, & Price, 2011), as well as individual behavioral adjustment as potential mechanisms (Vandell, Simpkins, & Liu, 2020). Future studies can explore these additional developmental pathways and mechanisms linking activity participation to individual development .

With the increasing diversity among the U.S. population, issues related to equity and culturally responsiveness are gaining unprecedented amount of attention from researchers as well as policy makers (Simpkins et al., 2017; Williams & Deutsch, 2016). Findings from the current dissertation suggest that it is not only important that all youth have access to organized activities. It is equally important that they have access to high quality afterschool activities. In a recent

study by Vandell and colleagues (2020), researchers found that participation in high quality programs and extracurricular activities have great potential in promoting academic performance and reducing problem behaviors among youth from low-income families. Considering the importance of high quality activity experiences in promoting diverse youth's development, future research should strive to understand what kind of activities are perceived as of high quality for diverse youth. While the current dissertation have examined multiple indicators of activity quality, existing measures of quality rarely take into consideration of the background characteristics of the youth served. As afterschool activities are serving increasingly diverse youth population, researchers should examine how culturally responsive practices are woven into all aspects of program processes as well as their implications for individual development (Simpkins et al., 2017).

Although the current dissertation utilized a longitudinal dataset, measures of activity participation was collected once a year. Studies from the current dissertation therefore are limited as they only capture a snapshot of quality of experiences in organized afterschool activities in a given year. According to bioecological theory of development, both individuals and their developmental contexts change over time (Bronfenbrenner & Morris, 2006). The relations between individuals and their contexts are likely to shift over time as well (Lerner & Castellino, 2002). In order to capture the dynamic interactions between individual and their developmental context in after-school programs, it is important that future research also examines youth's perceptions of their program experiences over time, and their implications for individual development.

Conclusion

With millions of U.S. youth participate in organized afterschool activities, the government as well as individual families have devoted great financial and human resources to these activities. While findings are still mixed regarding the effectiveness of organized afterschool activities, it is of great necessity that researchers examine the proximal processes and the nature of youth's experiences in those activities as well as their implications for individual functioning over the life span. Situated within the bioecological theory of development (Bronfenbrenner & Morris, 2006), the current dissertation examined the association between organized afterschool activities and individual development across multiple developmental periods including childhood, adolescence, and adulthood.

Findings from the current dissertation suggest that both the quantity and quality of experiences in organized activities are associated with individuals' school adjustment in childhood, academic performance during adolescence, as well as leisure time activities in adulthood. In addition, intensity and quality of experiences in earlier activities are related to later individual functioning via two pathways, including an activity participation pathway and an individual skills pathway. A more nuanced examination of different quality features suggests that duration and enjoyment in adolescent activities are strong predictors of leisure time activities in adulthood. In contrast, negative relational processes in organized activities have unwelcome influence on individual development. Future research on organized afterschool activities should account for both the quantity and quality of experiences in these contexts. In addition, researchers should strive to understand how different features of quality are associated to individual development and the related mechanisms.

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