

2017

Index to Volume 63

Merrill-Palmer Quarterly Editors

Follow this and additional works at: <https://digitalcommons.wayne.edu/mpq>

Recommended Citation

Quarterly Editors, Merrill-Palmer (2017) "Index to Volume 63," *Merrill-Palmer Quarterly*: Vol. 63 : Iss. 4 , Article 7.
Available at: <https://digitalcommons.wayne.edu/mpq/vol63/iss4/7>

MERRILL- PALMER

QUARTERLY

Journal of Developmental Psychology

October 2017

Volume 63 No. 4



WAYNE STATE UNIVERSITY PRESS

Editor

Gary W. Ladd
*T. Denny Sanford School of Social and Family
Dynamics*
Arizona State University, Tempe, Arizona

Associate Editors

Nina Howe
Department of Psychology
Concordia University
Julie Hubbard
Department of Psychological and Brain Sciences
University of Delaware
Amanda J. Rose
Department of Psychological Sciences
University of Missouri

Editorial Assistant

Chris Burns

Editorial Board

Julie Wargo Aikins
Wayne State University
Lynley Anderman
Ohio State University
Catherine Bagwell
Colgate University
Jason A. Chen
College of William and Mary
Antonius H. N. Cillessen
Radboud Universiteit Nijmegen

Pamela Garner
George Mason University
Heidi Gazelle
University of Melbourne
Ernest V. E. Hodges
St. John's University
Julie A. Hubbard
University of Delaware
Melanie Killen
University of Maryland
Kristin Lagattuta
University of California, Davis
Deborah Laible
Lehigh University
Brett Laursen
Florida Atlantic University
Lara Mayeux
University of Oklahoma
Kristina L. McDonald
University of Alabama
Helen Patrick
Purdue University
Christopher Trentacosta
Wayne State University
Ellen Usher
University of Kentucky
Lynne Zarbatany
University of Western Ontario

MERRILL-PALMER QUARTERLY (ISSN 0272-930X) is published in *January, April, July, and October* by Wayne State University Press, 4809 Woodward, Detroit, MI 48201. Periodicals postage paid at Detroit, MI and additional offices. Postmaster: Send address changes to *Merrill-Palmer Quarterly*, Wayne State University Press, 4809 Woodward, Detroit, MI 48201.

Information about journal policy and subscriptions, manuscript submissions, and past issues and articles is available on the *Merrill-Palmer Quarterly* website: <http://digitalcommons.wayne.edu/mpq>.

Academics and students affiliated with institutions that subscribe to Project Muse® or JSTOR can both view and download articles from the journals or packages to which the institution subscribes without paying an additional fee. To do so, users must access the Muse/JSTOR website on a computer connected to the institutional network. Articles may also be viewed on workstations at public libraries that subscribe to the Project Muse® and/or JSTOR database.

Merrill-Palmer Quarterly is regularly indexed in *Child Development Abstracts and Bibliography, Current Contents/Social and Behavioral Sciences, Current Index to Journals in Education, Linguistics and Language Behavior Abstracts, Psychological Abstracts, PsycSCAN: Developmental Psychology, Sage Family Studies Abstracts, Social Work Research and Abstracts, Sociological Abstracts, and Sociology of Education Abstracts* (British).

Subscription rates: institutions \$279.00 per year; Individuals \$115.00 per year; Students \$39.00 per year. ALL CHECKS SHOULD BE MADE PAYABLE TO WAYNE STATE UNIVERSITY PRESS. Foreign checks must be payable in U.S. funds from a prime U.S. bank, covering all bank charges and at no expense to us. Visa, MasterCard, and Discover are also accepted as payment. Canadian and foreign subscribers, please add \$60.00 per year for air foreign postage and handling. Back issues: Volumes 53 through 62 are available from WSU Press. *Institutions*: \$67.00 per single issue; \$134.00 per double issue; *Individuals and Students*: \$33.00 per single issue; \$66.00 per double issue. Volumes 1 through 52 may be purchased from UMI, 300 N. Zeeb road, Ann Arbor, MI 48108, except for the following which are out of print: Volumes 1–16 and Volume 21, No. 1.

For questions regarding subscription information and/or order fulfillment, please contact 1-800-WSU-READ or the journal subscription fax number, 1-313-577-6131.

See Press website: wsupress.wayne.edu

Copyright © 2018 by Wayne State University Press, Detroit, Michigan 48201



Journal of
Developmental Psychology

Contents

CONSULTING EDITORS	ii
Children's Task Engagement During Challenging Puzzle Tasks <i>Feihong Wang, James Algina, Patricia Snyder, and Martha Cox</i>	425
Children's Shyness, Peer Acceptance, and Academic Achievement in the Early School Years <i>Linlin Zhang, Natalie D. Eggum-Wilkens, Nancy Eisenberg, and Tracy L. Spinrad</i>	458
Peer Clique Participation of Victimized Children: Characteristics and Implications for Victimization Over a School Year <i>Lynne Zarbatany, Paul F. Tremblay, Wendy E. Ellis, Xinyin Chen, Megan Kinal, and Lisa Boyko</i>	485
The Positive Adjustment of Low-Income Youths With Relational and Community Support: The Mediating Role of Hope <i>Eddie C. W. Ng, Jasmine K. M. Lam, and Charles C. H. Chan</i>	514
Children's Recall of Storybook Events: Links With Attachment and Gender <i>Tia Panfile Murphy, Brianna Jehl, Kayla Hamel, Kelsey McCurdy, and Allison Halt</i>	543
INDEX TO VOLUME 63	561

Consulting Editors

Many scholars contribute their time and expertise to the quality of this journal by providing reviews of submitted manuscripts. We thank the individuals listed here, as well as members of the editorial board listed on the inside cover, for their recent work on behalf of this journal.

The Editors

Catherine Bagwell

Amy Bellmore

Kristin Bernard

Daniel Berry

Federica Bianco

Robert Bradley

Jude Cassidy

A. H. N. (Toon) Cillessen

Michael Crowley

Dawn DeLay

Michaela Gummerum

Paul Harris

Leah Hibel

Chris Holmes

Karen Kochel

Robyn Kondrad

Laurie Kramer

Nicole Lafko Breslend

Kristin Lagattuta

Katherine Lau

Serena Lecce

Elizabeth Lemerise

Jeffrey Liew

Julie MacEvoy

Lara Mayeux

Judith Meece

Dara Musher Eizenman

Florrie Fei-Yin Ng

Jamie Nordling

Larry Nucci

Beau Oldenburg

Isabelle Ouellet-Morin

Diana Rancourt

Christina Rinaldi

Kathleen Rudasill

Sonia Sengsavang

Rhiannon Smith

Emma Sterrett Hong

Margaret Swingler

Shauna Tominey

Tracy Vaillancourt

Carlos Valiente

Marinus Van IJzendoorn

Molly Weeks

Rachel White

Amber Williams

Dawn Witherspoon

Lynne Zarbatany

Janice Zeman

Children's Task Engagement During Challenging Puzzle Tasks

Feihong Wang, James Algina, and Patricia Snyder *University of Florida*
Martha Cox *University of North Carolina at Chapel Hill*
Family Life Project Key Investigators¹

We examined children's task engagement during a challenging puzzle task in the presence of their primary caregivers by using a representative sample of rural children from six high-poverty counties across two states. Weighted longitudinal confirmatory factor analysis and structural equation modeling were used to identify a task engagement factor indicated by child positive mood, persistence, enthusiasm, and compliance at both 24 and 35 months. Child attention and maternal responsiveness were significantly related to child task engagement at 24 and 35 months controlling for demographic factors. Additionally, a challenging behavior factor in children's task-oriented behaviors was found as indicated by child negative mood, aggression and noncompliance. This factor was predicted by low maternal acceptance of child behaviors. Theoretical and practical implications are discussed.

Feihong Wang, James Algina, and Patricia Snyder, Anita Zucker Center for Excellence in Early Childhood Studies; and Martha Cox, Department of Psychology and Neuroscience.

Address correspondence to Feihong Wang, Anita Zucker Center for Excellence in Early Childhood Studies, University of Florida, Gainesville, FL 32611. Phone: (919) 225-9323. Fax: (352) 392-2655. E-mail: feihongwg12@gmail.com.

1. The Family Life Project (FLP) Phase I Key Investigators include: Lynne Vernon-Feagans, University of North Carolina at Chapel Hill; Martha Cox, University of North Carolina at Chapel Hill; Clancy Blair, Pennsylvania State University; Margaret Burchinal, University of North Carolina at Chapel Hill; Linda Burton, Duke University; Keith Crnic, Arizona State University; Ann Crouter, Pennsylvania State University; Patricia Garrett-Peters, University of North Carolina at Chapel Hill; Mark Greenberg, Pennsylvania State University; Stephanie Lanza, Pennsylvania State University; Roger Mills-Koonce, University of North Carolina at Greensboro; Emily Werner, Pennsylvania State University, and Michael Willoughby, RTI International.

The Family Life Project was supported by the National Institute of Child Health and Human Development (PO1-HD-39667) to the University of North Carolina at Chapel Hill and

Merrill-Palmer Quarterly, October 2017, Vol. 63, No. 4, pp. 425–457. doi: 10.13110/merrpalmquar1982.63.4.0425 Copyright © 2018 by Wayne State University Press, Detroit, MI 48201.

Accumulating research suggests that high engagement in academic tasks predicts positive educational and developmental outcomes such as higher grades and school completion and lower involvement in delinquency, substance abuse, and problem behavior (M. Wang & Degol, 2014). It is important to understand precursors of academic engagement during early childhood so as to foster skills and abilities that are conducive to high academic engagement and positive school outcomes. A substantial body of literature on individual child and environmental variables predicts school or academic engagement among school-aged children (e.g., Fredricks et al., 2011). A gap remains in understanding engagement during challenging but developmentally appropriate tasks in the early childhood years that might be a precursor of academic engagement described during the school-aged years (Fredricks, Blumenfeld, & Paris, 2004).

Academic engagement for school-aged children in reference to challenging academic activities is defined as sustained, goal-directed, and energized action that encompasses emotional, behavioral, and cognitive processes (Skinner, Kindermann, Connell, & Wellborn, 2009; M. Wang & Degol, 2014). Assessment of academic engagement focused on the *quality* of sustained, goal-directed, and energized action in challenging learning contexts among school-aged children (Skinner et al., 2009). But mainstream research on engagement in early childhood focuses on documenting the *quantity* (i.e., frequency, type, level, or duration) of engagement in activities that may or may not be challenging (McWilliam & Bailey, 1992; McWilliam & Casey, 2008; Sutherland, Conroy, Vo, Abrams, & Ogston, 2013). Challenging problem-solving tasks have been used with young children to elicit *qualitatively* different levels of emotional, behavioral, and cognitive efforts toward task completion, which are relevant aspects of students' engagement in academic activities, but these aspects have not been explicitly considered in examining a potential task engagement factor in young children (Davis, Burns, Snyder, Dossett, & Wilkerson, 2004; Egeland, Sroufe, & Erickson, 1983; Harris, Robinson, Chang, & Burns, 2007; Matas, Arend, & Sroufe, 1978; Sroufe, 1979). We emphasize a qualitative approach in understanding engagement to supplement the current quantitative approach to young children's engagement and to align with the qualitative approach in understanding academic engagement of school-aged

Pennsylvania State University. Additional funding came from the National Institute of Drug Abuse and the National Institutes of Health Office of Minority Health. We express our sincere gratitude to all families and children who participated in this research and to the Family Life Project research assistants. Preparation of this report was supported, in part, by an Institute of Education Sciences postdoctoral fellowship training grant (R324B1200002) to the University of Florida. The opinions expressed are those of the authors, not the funding agencies.

children. We also emphasize challenging tasks because developmentally appropriate challenges are norms in school learning and are an embedded context for learning to occur (Vygotsky, 1978). Challenges can also motivate children to persist when problem-solving tasks are a "just right" challenge sustaining children's efforts (Harter, 1975), which is critical for learning.

This study aims to explore a task engagement factor underlying child performance during a challenging puzzle task that might have the potential to serve as a precursor of student engagement for future investigation. We draw on the motivational perspective of academic engagement (Skinner et al., 2009) and the organizational perspective on development (Sroufe, 1979) to hypothesize this task engagement factor and use a longitudinal measurement model to test the factor structure at both 24 and 35 months of child age. In addition, research suggests that children's temperamental differences and parenting context are related to their abilities in regulating behavior and emotion, staying on task, and exploratory motivation (e.g., Spinrad et al., 2012; Stifter, Spinrad, & Braungart-Rieker, 1999). Therefore, we investigate whether infant temperament and early parenting behaviors are related to the potential task engagement factor underlying children's performance in challenging problem-solving tasks. Support for the relationships between infant temperament and parenting behaviors as related to the potential task engagement factor would also provide evidence for the construct validity of the task engagement factor.

Skinner's Motivational Perspective on Engagement as a Guiding Framework

Synthesizing engagement literature among school-aged students, Skinner et al. (2009) proposed that engagement refers to sustained goal-directed and energized action that encompasses three dimensions or processes (i.e., behavioral, emotional, and cognitive). Such goal-directed and energized action demonstrates children's motivation for gaining competency and reflects the dynamic nature of the development of students' motivation for achievement in interaction with the context (Skinner et al., 2009). For each dimension of the engagement, one should consider both the initiation of the motivated action as well as the endurance of such action given challenges. As such, the behavioral dimension of engagement includes persistence, perseverance, intensity, efforts, and determination in facing difficulties and challenges. The emotional dimension of engagement includes enjoyment, enthusiasm, fun, and satisfaction. The cognitive dimension of engagement includes focus, purposefulness, follow-through, goal strivings, etc.

Although the motivational perspective of individual engagement among school-aged children is theoretically rich, the developmental origin of student engagement in early childhood by using Skinner's framework has not been well described. Skinner et al. (2009) specifically acknowledged that it is important to consider the developmental timing of engagement. Other researchers (Fredricks et al., 2004) also called for more studies in understanding how engagement evolves as a higher-order construct that encompasses behavioral, emotional, and cognitive dimensions. While there are studies examining select aspects of the engagement dimensions defined in Skinner's framework, such as attention, emotion regulation, and mastery motivation, the data in these studies either were not collected by using challenging tasks or were not framed by using the three dimensions of engagement previously described (e.g., Downer, Booren, Lima, Luckner, & Pianta, 2010; Sutherland et al., 2013). Understanding task engagement that includes children's emotional, behavioral, and cognitive efforts in the face of challenges in early childhood informs us about children's efforts in approaching challenges and is one necessary step in understanding the evolution of student engagement in challenging academic tasks.

Given that qualitatively different aspects of child behavior, emotion, and cognition are often coded in challenging problem-solving tasks (e.g., National Institute of Child Health and Human Development Early Child Care Research Network [NICHD ECCRN], 1999), child data can be used to explore whether an underlying factor of task engagement emerges that is aligned with Skinner et al.'s (2009) framework. It is also possible to test whether the relationships between this latent factor and its observed indicators are equivalent in the toddlerhood and preschool periods, evidence of which would suggest measurement invariance (Cheung & Rensvold, 2002). Support for both would provide preliminary construct validity evidence for the theorized task engagement construct in early childhood and help establish this construct as a candidate for understanding the origins in early childhood of engagement in challenging academic activities.

It is worth noting that in Skinner et al. (2009), emotional, behavioral, and cognitive dimensions were conceptualized as three distinct factors subordinate to the metaconstruct of student engagement, which can be assessed through both observation and self-report. For young children's performance during challenging problem-solving tasks, this may not be possible for two reasons. First, developmental systems theories have suggested that children's affect, behavior, and cognition begin as rudimentary and limited and become increasingly differentiated and complex as they grow (Molenaar & Lerner, 2013). Second, at toddler and preschool ages,

children are not verbally capable of self-reporting their emotion, behavior, and cognition. In addition, our aim was to examine the underlying factor based on one challenging problem-solving task rather than across different tasks. Therefore, we expected one single underlying factor to be indicated by the emotional, behavioral, and cognitive processes or components.

Organizational Perspective on Young Children's Performance During Challenging Tasks

The organizational perspective of development (Sroufe, 1979) emphasizes that different aspects of an individual are coordinated in functioning toward goal pursuit, such that the social-emotional and cognitive aspects of development are not separable (Sroufe & Waters, 1976). Therefore, perceptual, emotional, and cognitive aspects of behavior should be studied concurrently (Cicchetti & Sroufe, 1976) to reach an integrated understanding of the organization of development and the continuity of competence in children with regard to their regulatory capacity across domains (Sroufe, Coffino, & Carlson, 2010; Waters & Sroufe, 1983). Specifically, growing out of dyadic regulation in infancy, toddlers usually show emergent self-regulatory capacity supported by the guidance of the caregiver. By the preschool period, independent self-regulation takes shape in children without the ongoing need of caregivers' support (Egeland, Bosquet, & Levy-Chung, 2002; Kochanska, 1993). Children with the ability to modulate their arousal, stay on task, persist in their efforts in the face of challenges, and enjoy tasks are more likely to become students who demonstrate engagement in challenging academic tasks. Children who show frustration, negativity, and opposition are likely to be disengaged from goal pursuit. Therefore, factors underlying young children's affect, behavior, and cognition in problem-solving challenging tasks may be relevant to their later engagement in challenging academic tasks because there are likely similarities in demands for capacities with which one accommodates and adapts to age-appropriate task challenges for young children and those required by challenging academic tasks or activities for school-aged children.

Challenging problem-solving tasks have often been structured with consideration for the transfer of regulation from other regulation to self-regulation in early childhood and often with the company of a caregiver (Davis et al., 2004; Harris et al., 2007). Some label these tasks as parent-child interaction tasks or teaching tasks (Egeland et al., 1983; Matas et al., 1978; Sroufe, 1979) because they were also used to concurrently understand the facilitative or disruptive aspects of parenting behavior and

the parent–child relationship among the dyads. Challenging tasks have been designed such that some were within the capacity of children; however, others were sufficiently difficult that parents might need to provide some help for the child (Davis et al., 2004; Egeland et al., 1983; NICHD ECCRN, 1999), and children would need to exert some regulatory effort to complete tasks.

Child variables in these types of challenging problem-solving tasks, aligned with the organizational perspective of development, encompass emotional, behavioral, and cognitive indicators. For example, child persistence, compliance to parent directives, reliance on help from the caregiver, and avoidance of the parent (Egeland et al., 1983, 2002; Matas et al., 1978) are behavioral indicators. Task enthusiasm, anger and negativity, affection shown toward the parent, and negativity toward the caregiver are emotional indicators. Child persistence toward challenging problem-solving tasks also reflects the cognitive process of engagement that includes purposefulness, goal strivings, challenge taking, strategy search, and following through. These variables and especially child persistence, as assessed in early childhood, are related to children's later educational outcomes (McDermott, Rikoon, & Fantuzzo, 2014) and hold promise for understanding the underlying factors relevant to their later engagement in academic activities.

Most research to date, however, has used these individual child variables as separate predictor or outcome measures (e.g., Luby et al., 2006). Although some have explored the underlying factors in these child-related variables (e.g., Shigeto, Mangelsdorf, & Brown, 2013), the purpose was for data reduction rather than for understanding the constructs measured by the variables. Rarely have studies attempted to test rigorously the factorial structure of observed child behavior in challenging problem-solving tasks in early childhood and explore measurement invariance across toddler and preschool ages. A motivational perspective on academic engagement among school-aged students, however, offers a potential framework for exploring a latent task engagement factor based on these child variables in challenging problem-solving tasks in early childhood.

Child and Parent Influences on Children's Performance During Challenging Problem-Solving Tasks

As Skinner et al. (2009) indicated, engagement should be understood within context. It is important to understand the extent to which child constitutional differences in reactivity and regulation and variations in parenting behaviors may be related to children's performance

during challenging problem-solving tasks. Indeed, children differ in their responses to external and internal stimuli as early as infancy, and these temperamental differences have an ongoing impact on children's behavior, emotion, attention, motor activity, and goal pursuit (Fox, 1998). For example, infants with high versus low behavioral reactivity are more likely to have difficulty in focusing attention under stress as young children (Pérez-Edgar & Fox, 2005). Infants low on regulatory behavior are less likely to comply to requests as toddlers (Stifter et al., 1999). Therefore, we expect infant temperament to be significantly related to the task engagement factor underlying children's observed performance during challenging problem-solving tasks.

With regard to parental influences on children's performance during challenging problem-solving tasks, studies have found significant positive relationships between maternal responsiveness or acceptance and child positive mood, compliance, and persistence (e.g., Erickson & Lowe, 2008; Spinrad et al., 2012; F. Wang, Cox, Mills-Koonce, & Snyder, 2015; Young & Hauser-Cram, 2006). Studies have also documented the detrimental effect of maternal nonacceptance or harsh control on children's autonomy and exploration in activities (e.g., Grolnick, 2003; Tamis-LeMonda, Briggs, McClowry, & Snow, 2009). As such, we hypothesize a positive relationship between the early caregiving environment, including maternal responsiveness and acceptance, and children's task engagement that underlies their emotional, behavioral, and cognitive efforts.

Purpose of the Study

This study aimed to explore a potential underlying factor of task engagement in toddlers' and preschoolers' task-oriented behavior by using the theoretical framework of Skinner et al. (2009). We examined the factorial structure of six child variables (child positive mood, negative mood, persistence, enthusiasm, compliance, and aggression) that were assessed as part of a challenging puzzle task in the presence of the primary caregivers. The challenging puzzle tasks were administered when children were 24 and 35 months of age. We hypothesized that, by 24 months, a task engagement factor (positively loaded by positive mood, persistence, enthusiasm, and compliance, and negatively loaded by negative mood and aggression) would characterize children's task-oriented behavior and that factor loadings for the six child codes would be invariant from 24 to 35 months. In addition, we hypothesized that infant temperament and early parenting each would be significantly related to children's task engagement at 24 and 35 months.

Method

Participants

The participants in this study ($n = 1,125$) came from the Family Life Project (FLP; $N = 1,292$). The FLP is a large-scale, longitudinal observational study of young children from birth to second grade recruited from three poor rural counties in North Carolina and three poor rural counties in Pennsylvania (Vernon-Feagans & Cox, 2013). Consent forms were obtained from the primary caregiver at the birth of the child. The study sample included participants who had data on the observed child variables in the puzzle tasks. Most of the primary caregivers were mothers, but, in some cases, the primary caregivers were either fathers or relatives. The mean education level for the primary caregiver was 14.42 years ($SD = 2.82$) with a range of 6–22 years of education. Among the child participants, 51% were boys, 43% were African Americans, and 56% were European Americans.

Some participants did not have complete data on every covariate or child variable. Missing data counts and percentages in this subsample are 69 (6%) for child codes at 24 months, 129 (11.5%) for child codes at 35 months, 31 (2.8%) for infant temperament, and 37 (3.3%) and 38 (3.4%) for the parental responsiveness and acceptance subscales on the home observation measurement of environment inventory (IT-HOME; Caldwell & Bradley, 1984).

Procedures

The data analyzed in the current study were collected during home visits to the participating families when the children were 2, 6, 24, and 35 months old. At 2 months, primary caregivers reported their highest education levels, as well as child gender and race. At 6 months, home visitors used the infant behavior record (IBR; Bayley, 1969) questionnaire to collect data on infant temperament and completed the IT-HOME (Caldwell & Bradley, 1984), which yielded information on parenting behaviors of the primary caregivers. At 24 and 35 months, the primary caregiver and child worked on a 10-min puzzle task that was videotaped by home visitors for later coding of parent and child behaviors during the task (Cox, 1997).

Measures

Task engagement. Task engagement was assessed based on six different aspects of observed child behavior during a 10-min challenging parent-child puzzle task when children were 24 and 35 months old. At both 24 and 35

months, the same parent-child dyads were asked to complete three wooden puzzles of increasing level of difficulty, starting with the easiest. To complete the puzzles, children needed to be able to recognize the different shapes of the puzzle pieces, memorize the shapes, and manually match them with the corresponding cutouts on the puzzle board. At 24 months, the peg wooden puzzles were used, which had colorful fruit or animal themes with about 3-10 relatively big pieces. The knobs on the puzzle pieces helped children to grasp the puzzle pieces easily. Each piece was also matched with a cutout of same shape on the puzzle board. At 35 months, the puzzles no longer had the knobs on the pieces, given the fine motor skills of most children of this age. Children's memory and recognition skills were also more advanced as compared to those at 24 months. Therefore, the wooden puzzles included about 5-26 pieces with more complexity in size and shape so as to match the developmental growth in object manipulation and fine motor skills from 24 to 35 months.

Child behavior during the puzzle task sessions was coded by using six subscales on a parent-child interaction coding system adapted by Cox (1997) from the parent-child interaction coding system used in the NICHD ECCRN (1999). The *positive mood* subscale assesses the degree to which the child is generally satisfied and content during the session as shown through laughter, smiles, positive vocalization, and body movement that could be both relevant or irrelevant to the puzzle task itself. The *negative mood* subscale assesses the degree to which the child frowns, fusses, cries, shows hostility, dislike, or anger to the parent, as well as other indications of discontent. The *persistence* subscale assesses the degree to which the child concentrates and is focused on problem-solving efforts toward the puzzle task. The *enthusiasm* subscale assesses the degree to which the child shows interest, eagerness, confidence, and vigor in problem-solving efforts toward the puzzle task specifically. The *compliance* subscale assesses the degree to which the child follows parent's directives and requests willingly. The *aggression* subscales assesses the degree to which the child shows overt or covert aggressive behavior (e.g., kicks legs or throws puzzle pieces) or vocalizations (e.g., yells or shouts) toward objects or persons during the puzzle session.

These six aspects of child behavior map onto the behavioral, emotional, and cognitive processes of engagement as defined in Skinner et al. (2009). The compliance, persistence, and aggression codes capture the behavioral processes of child task engagement. The positive mood, negative mood, and enthusiasm codes capture the emotional processes of child task engagement. The persistence code also captures the cognitive goal-directed processes of child task engagement.

This rating system was designed for coding child behavior in challenging situations such as puzzle or tool-use tasks (Cox, 1997). Ratings, based on watching the whole videotaped episode, focus on both the quality and quantity of child affect and behavior and thus take frequency, intensity, and duration of child affect and behavior into account. Ratings for each subscale range 1–7, with 1 indicating *not characteristic of the child* and 7 indicating *highly characteristic of the child* for the specific subscale.

Coders were trained by the master coder (i.e., the first author of the current paper) through initial informational sessions about the six subscales and the rating system, and the underlying child development theories, when relevant. Trainees then practiced weekly coding of the six child subscales and conferenced with the master coders on the assigned sets of training cases. Intercoder reliability was monitored weekly by using an intraclass correlation coefficient (ICC) between the trainees and the master coders until an ICC of .80 was achieved. None of the coders had prior knowledge about the participants, nor were they involved in data collection. Each subscale was coded by two certified coders (a certified coder had achieved an ICC at or above .80 with a master coder during training and maintained that level of ICC during coding) or by one master coder (a master coder had achieved an ICC at or above .90 with other master coders during training and maintained that level of ICC during coding). Coding differences were resolved through conferencing, and the consensus codes were used for analysis. For the current study, scores on all six subscales were treated as ordinal variables to account for the ordinal scales used in the rating process and used as indicators of a latent task engagement factor.

Infant temperament. Infant temperament was assessed by home visitors at 6 months by using the 11-item IBR (Bayley, 1969) and Blaise software. Items were rated on either a 5-point or a 9-point scale based on the home visitors' global observation of child behavior during the whole home visit. Six composites were constructed from the 11 items by averaging scores across observers and visits: *social approach* (social responsiveness to mother or caregivers, social responsiveness to persons, and social responsiveness to examiners), *positive affect* (degree of happiness and reverse-coded fearfulness), *attention* (object orientation, attention span, and endurance), *activity level*, *reactivity*, and *irritability*. Internal consistency score reliability of the composites was between .70 (*irritability*) and .88 (*attention*) (Odom, Garrett-Peters, Vernon-Feagans, & FLP Investigators, 2014). All the composites were used for the current analysis to examine the relationship between different aspects of infant temperament and children's engagement at 24 and 35 months.

Parenting behaviors. Parenting behaviors were assessed based on a home visit when children were 6 months of age. Two home visitors conducted a structured interview with each of the primary caregivers and scored items on three subscales of the IT-HOME (Caldwell & Bradley, 1984): parental responsiveness, parental acceptance of the child, and learning materials. *Parental responsiveness* and *parental acceptance* were used in the current study to examine the relationships between parental responsiveness and acceptance in infancy and children's task-oriented behavior at 24 and 35 months. Parental responsiveness is a mean composite of items 1–11 across home visitors, and parental acceptance is a mean composite of items 12–19 with items 12–17 being reverse scored. Higher scores on the two composites indicate more responsiveness and acceptance, respectively. Psychometric information based on Cox (2007) suggests that the internal consistency score reliability for the total scale is .89 with a range .38–.89 for the subscales.

Analytic Strategies

Longitudinal confirmatory factor analysis (CFA) was used to test the proposed factor structure in children's task-oriented behavior during the challenging puzzle task. CFA was conducted by using the weighted least squares estimator mean and variance adjusted (WLSMV) estimator and theta parameterization in *Mplus* 7.11 (Muthén & Muthén, 1998–2012). Measurement invariance was investigated by fitting the following four models (Widaman, Ferrer, & Conger, 2010): configural invariance (CI), weak factorial invariance (WFI), strong factorial invariance (SGFI), and strict factorial invariance (STFI). Each model was fit to 12 observed variables (six variables at each of two ages) with factorial invariance constraints applied across age. From a measurement standpoint, identifying the factor structure and demonstrating measurement invariance across time provide preliminary validity evidence for the theorized underlying task engagement construct in early childhood.

In longitudinal factor analysis, the CI model specifies factors at each time point but does not employ any equality constraints for the parameters. The additional models are distinguished by the across-age equality constraints specified in the models. The constraints specified for each observed variable in the additional models are as follows: WFI—factor loadings; SGFI—factor loadings and thresholds; and STFI—factor loadings, thresholds, and residual variances for the factor indicators. Thresholds for a variable reflect the proportion of responses in the seven response categories and, therefore, measure the location of the scores in the response categories.

Chi-square–difference tests and model fit statistics including the comparative fit index (CFI), the Tucker–Lewis Index (TLI), and the root mean square error of approximation (RMSEA) were used to compare models. CFI and TLI equal to or greater than .95 and RMSEA less than .06 are considered as good overall fit for the model (Hu & Bentler, 1999). Although model fit can be compared by using χ^2 difference tests, these tests often detect relatively small differences in fit; therefore, changes in fit indices are often more appropriate for comparing models. Changes in CFI greater than .01 are considered as evidence for rejecting measurement invariance (Cheung & Rensvold, 2002; Satorra & Bentler, 2001).

Structural equation modeling (SEM; Kline, 2011) was conducted by adding covariates to the final longitudinal CFA measurement model (i.e., the STFI model). The control variables were child gender and race and maternal education. Infant temperament and parental responsiveness to and acceptance of the child were the predictors hypothesized to be related to child task engagement at 24 and 35 months. In this hybrid model, child and parent variables predicted task engagement at 24 and 35 months, and children's task engagement at 24 months was allowed to predict children's task engagement at 35 months. The WLSMV estimator with theta parameterization was used to estimate the longitudinal CFA models and SEM in *Mplus* 7.11. Applying the WLSMV estimator to SEM resulted in including all available scores for each participant. Sampling weights (Berry et al., 2014) were applied to all the CFA models and SEM.

Results

Descriptive Statistics

Response frequencies and percentages for the six child codes (i.e., positive mood, negative mood, persistence, enthusiasm, compliance, and aggression) are listed in Table 1. A total of 1,125 child participants had child code data; 927 child participants had complete puzzle task data at both ages. Another 69 participants had complete puzzle task data at 24 months but not at 35 months, and an additional 129 participants had complete puzzle task data at 35 months but not at 24 months. Descriptive statistics, sample size for each covariate variable within the study sample ($n = 1,125$), and correlation coefficients are shown in Table 2. At 6 months, boys had significantly higher positive affect ($r = .08, p < .05$) and higher activity level ($r = .11, p < .001$) than girls.

Being African American was related to lower maternal education ($r = -.22, p < .001$), lower approach ($r = -.07, p < .05$), higher positive affect

Table 1. Frequency counts of the factor indicators at 24 and 35 months

		1 Not characteristic	2	3	4 Middle	5	6	7 Highly characteristic
Positive mood	24m	13 (1.23%)	67 (6.34%)	338 (32.01%)	339 (32.10%)	230 (21.78%)	60 (5.68%)	9 (0.85%)
	35m	9 (0.90%)	47 (4.72%)	331 (33.23%)	378 (37.95%)	177 (17.77%)	43 (4.32%)	11 (1.10%)
Negative mood	24m	279 (26.42%)	258 (24.43%)	210 (19.89%)	154 (14.58%)	84 (7.95%)	42 (3.98%)	29 (2.75%)
	35m	424 (42.57%)	268 (26.91%)	190 (19.08%)	67 (6.73%)	36 (3.61%)	5 (0.50%)	6 (0.60%)
Persistence	24m	28 (2.65%)	128 (12.12%)	239 (22.63%)	232 (21.97%)	149 (14.11%)	168 (15.91%)	112 (10.61%)
	35m	10 (1.00%)	27 (2.71%)	165 (16.57%)	358 (35.94%)	231 (23.19%)	143 (14.36%)	62 (6.22%)
Enthusiasm	24m	25 (2.37%)	130 (12.31%)	241 (22.82%)	267 (25.28%)	267 (25.28%)	106 (10.04%)	20 (1.89%)
	35m	18 (1.81%)	66 (6.63%)	191 (19.18%)	319 (32.03%)	302 (30.32%)	85 (8.53%)	15 (1.51%)

Continued

Table 1. Frequency counts of the factor indicators at 24 and 35 months (Continued)

		1 Not characteristic	2	3	4 Middle	5	6	7 Highly characteristic
Compliance	24m	17 (1.61%)	65 (6.16%)	129 (12.22%)	221 (20.93%)	197 (18.66%)	206 (19.51%)	221 (20.93%)
	35m	13 (1.31%)	16 (1.61%)	47 (4.72%)	168 (16.87%)	256 (25.7%)	242 (24.3%)	254 (25.5%)
Aggression	24m	703 (66.57%)	160 (15.15%)	112 (10.61%)	43 (4.07%)	24 (2.27%)	10 (0.95%)	4 (0.38%)
	35m	903 (90.66%)	53 (5.32%)	26 (2.61%)	7 (0.70%)	5 (0.50%)	0 (0%)	2 (0.20%)

Note. The $n = 1,056$ at 24 months and $n = 996$ at 35 months; $n = 1,125$ across 24 and 35 months.

Table 2. Descriptive statistics and bivariate correlations among covariates

	1 Child gender	2 Child race	3 Parent educ.	4 Infant appr.	5 Infant affect.	6 Infant atten.	7 Infant activ.	8 Infant react.	9 Infant irrit.	10 Parental respons.	11 Parental accept.
1	–										
2	.004	–									
3	-.01	-.22***	–								
4	.02	-.07*	.12***	–							
5	.08*	.12***	-.01	.54***	–						
6	.06+	-.01	.05+	.69***	.7***	–					
7	.11***	.02	.10***	.57***	.47***	.6***	–				
8	.03	.03	.10***	.66***	.35***	.6***	.66***	–			
9	-.03	-.13***	.03	-.36***	-.71***	-.58***	-.28***	-.18***	–		
10	-.01	-.30***	.31***	.28***	.03	.17***	.2***	.23***	-.03	–	
11	-.04	-.47***	.30***	.04	-.05	.03	-.05***	-.03	.04	.30***	–
M	0.51	0.43	14.42	13.4	13.1	17.7	5.65	5.58	3.05	0.81	0.83
SD	.50	.50	2.82	1.59	1.93	2.43	1.03	.88	1.01	0.2	0.14
N	1,125	1,125	1,125	1,094	1,094	1,094	1,094	1,094	1,094	1,088	1,087

Note. Girl = 1; boy = 2; non-African American = 0; African American = 1; Parent educ. = parent education; Infant appr. = infant approach; Infant atten. = infant attention; Infant activ. = infant activity; Infant react. = infant reactivity; Infant irrit. = infant irritability; Parental respons. = parental responsiveness; Parental accept. = parental acceptance; M = mean.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

($r = .12, p < .001$), less irritability ($r = -.13, p < .001$), and less maternal responsiveness and acceptance ($r = -.30$ and $-.47$, respectively; $p < .001$). Higher maternal education was related to higher infant approach, activity, reactivity, and higher maternal responsiveness and acceptance ($r = .12, p < .001$; $r = .10, p < .001$; $r = .10, p < .001$; $r = .31, p < .001$; $r = .30, p < .001$, respectively). Infant attention was significantly related to maternal responsiveness ($r = .17, p < .001$), as well as to all the other infant temperament variables. Maternal responsiveness and acceptance were significantly correlated ($r = .30, p < .001$).

Factor Structure of Child Task-Oriented Behavior

Measurement invariance was investigated by sequentially fitting the CI, WFI, SGFI, and STFI models. The initial model, which specified a single factor at each occasion, did not fit the data adequately, $\chi^2(83) = 1573.68, p < .001$; CFI = .893; TLI = .866; RMSEA = .16. Strong correlation coefficients for negative mood and aggression ($r = .823$ and $r = .756$ at 24 and 35 months, respectively) and theoretical considerations (Hemmeter, Fox, & Snyder, 2013) suggested a challenging behavior factor in addition to the task engagement factor. Therefore, we repeated the measurement invariance analysis with two-factor models. The task engagement factor was loaded by positive mood, persistence, enthusiasm, and compliance, whereas the challenging behavior factor was loaded by negative mood and aggression. Modification indices suggested the need for compliance to load on the challenging behavior factor, as well as for the residuals of positive mood and enthusiasm to correlate at both ages. These correlated residuals may reflect that the occurrence of positive affect, vocalization, and body movement toward tasks may be viewed as indications of both positive mood and enthusiasm by coders. These additional parameters were included in all models. Figure 1 depicts the revised CI model with excellent model fit, $\chi^2(44) = 116.217, p < .001$; CFI = .995; TLI = .992; RMSEA = .038. Measures of fit are shown in Table 3. All models showed evidence of excellent overall model fit, including the most restricted model, the STFI model in which equality constraints were placed not only on the factor loading and thresholds but also on the error variance of the factor indicators.

Although all the χ^2 -difference tests were statistically significant, differences in the estimates being compared were small, and the declines in the model fit statistics (CFI, TLI, and RMSEA) were all much less than .01. This suggests the two-factor model is invariant across 24 and 35 months (see unstandardized and standardized estimates of factor loadings from the STFI model in Table 4). The unstandardized estimates of factor loadings

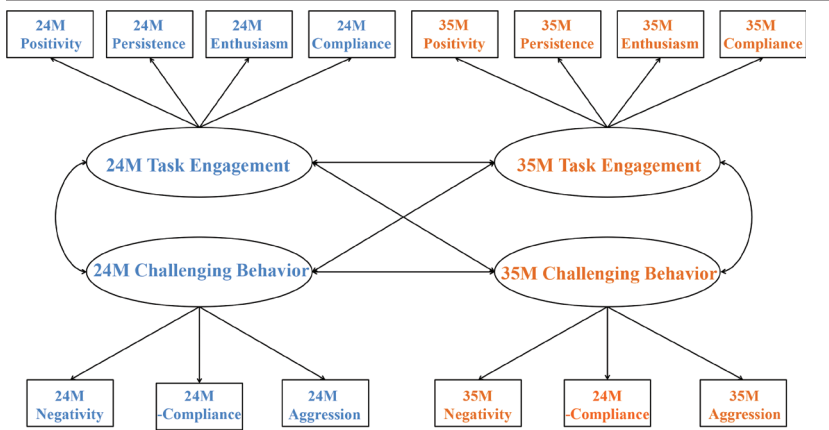


Figure 1. Conceptual model for the final confirmatory factor analysis. Error components are not shown in the graph but were incorporated in the model estimation. Double-headed straight arrows and curved arrows depict covariance between factors. M = months. The “-” in front of “Compliance” indicates negative loading.

Table 3. Model comparison: Two-factor confirmatory factor analysis

	CFI	TLI	RMSEA	χ^2 Differences
Configural invariance (CI)	0.995	0.992	0.038	NA
Weak factorial invariance (WFI)	0.993	0.991	0.041	26.102 (5), $p = .0001$
Strong factorial invariance (SGFI)	0.989	0.991	0.042	93.521 (27), $p < .001$
Strict factorial invariance (STFI)	0.986	0.989	0.047	61.708 (6), $p < .001$

Note. CFI = comparative fit index; TLI = Tucker–Lewis index; RMSEA = root mean squared error of approximation.

for task engagement and challenging behavior factors were equal from 24 to 35 months because of the constraints in the STFI, which reflect measurement invariance. The standardized estimates show differences across time, however, because of changes over age in the variability of the factor indicators and the factors. The highest standardized loadings on the task engagement factor are for child persistence (.939) and child enthusiasm (.807), with lower loadings for positive mood (.520) and child compliance (.467) on this factor. These loadings suggest that child persistence and child enthusiasm are stronger indicators of task engagement than are positive mood and child compliance.

Table 4. Unstandardized and standardized factor loadings of the task engagement and challenging behavior factors at 24 and 35 months

Child codes	Task engagement at 24 months	Challenging behavior at 24 months	Task engagement at 35 months	Challenging behavior at 35 months
Positive mood	1.000 (.520)		1.000 (.363)	
Persistence	4.480 (.939)		4.480 (.868)	
Enthusiasm	2.247 (.807)		2.247 (.659)	
Compliance	1.609 (.467)	-0.537 (-.497)	1.609 (.373)	-.537 (-.548)
Negative mood		1.000 (.889)		1.000 (.864)
Aggression		1.338 (.933)		1.338 (.917)

Note. Unstandardized estimates of the factor loadings are without parentheses, and standardized factor loadings are in parentheses.

$p < .001$ for all the estimated factor loadings.

Table 5 lists the correlation coefficients for the factors at 24 and 35 months from the STFI model. In the STFI model, means for the task engagement and challenging behavior factors were set equal to zero at age 24 months and estimated at 35 months. As a result, the means at 35 months estimate change in factor means from 24 to 35 months. The means for task engagement at 35 months (.053) and challenging behavior at 35 months (-1.085) were both significantly different from zero, indicating significant change in the means across age for both factors. Task engagement was higher at age 35 months, and challenging behavior was lower. Effect sizes were .09 and -.56, using the standard deviations at age 24 months as denominators. In addition, variances for both factors (.371 and .152 for task engagement and 3.76 and 2.929 for challenging behavior at ages 24 and 35 months, respectively) declined and were significantly different over age.

Covariate Effects on Child Task-Oriented Behavior

Covariates were added to the STFI model as predictors of task engagement and challenging behavior at both 24 and 35 months. The model shows excellent model fit, $\chi^2(170) = 334.641$, $p < .001$; CFI = .989; TLI = .984; RMSEA = .029. Being male was related to less task engagement and more challenging behavior at 24 months ($b = -.27$, $p < .001$; and $b = .24$, $p < .01$,

Table 5. Correlations of task engagement and challenging behavior at 24 and 35 months for the strict factorial invariance model

	Task engagement at 24 months	Challenging behavior at 24 months	Task engagement at 35 months	Challenging behavior at 35 months
Task engagement 24m	1.00			
Challenging behavior 24m	-.665	1.00		
Task engagement 35m	.563	-.219	1.00	
Challenging behavior 35m	-.236	.292	-.502	1.00

Note. All p values are $<.001$.

respectively). Being African American was related to less task engagement at 24 months only ($b = -.32, p < .001$). Better infant attention at 6 months was related to higher task engagement at 24 months ($b = .20, p < .001$). Other infant temperament variables were not significant predictors of engagement or challenging behavior at 24 and 35 months and are omitted from reporting here.

Higher maternal education at 6 months was associated with children's higher task engagement and lower challenging behavior at 24 months ($b = .20, p < .001$; and $b = -.11, p < .01$). Maternal responsiveness was positively related to child task engagement at 35 months ($b = .13, p < .01$) above and beyond the effect of 24-month child task engagement and challenging behavior and the other covariate effects. Maternal acceptance was positively related to task engagement ($b = .00, p < .05$) and negatively related to child challenging behavior at 24 months ($b = -.10, p < .05$).

In addition, child task engagement at 24 months significantly predicted child task engagement at 35 months ($b = .68, p < .001$), and child challenging behavior at 24 months significantly predicted child challenging behavior at 35 months ($b = .24, p < .001$). With regard to cross-domain prediction, higher child task engagement at 24 months was associated with lower child challenging behavior at 35 months at a trend level that did not reach statistical significance ($b = -.08, p > .05$). Child challenging behavior at 24 months, however, showed a significant and positive relationship with child task engagement at 35 months ($b = .25, p < .01$). Table 6 shows a summary of the covariate effect analysis.

Table 6. Standardized coefficient for covariates effect on task engagement and challenging behavior

	Task engagement at 24 months	Challenging behavior at 24 months	Task engagement at 35 months	Challenging behavior at 35 months
Child gender	-.27***	.24**	-.11	.14
Child race	-.32***	-.00	-.09	-.07
Maternal education	.20***	-.11**	.07	.04
Infant attention	.16*	-.06	-.04	-.067
Responsiveness	.06	-.03	.13**	-.04
Acceptance	.00	-.10*	-.05	.03
Task engagement (24m)	NA	NA	.68***	-.08
Challenging behavior (24m)	NA	NA	.25**	.24***

Note. $\chi^2(170) = 334.643$, $p < .001$; RMSEA = .029; CFI = .989; TLI = .984. Effects for temperament variables with p values of $>.05$ are omitted from the table. Standardized coefficients are reported; for child gender and child race, coefficients are standardized for the dependent variable only.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Discussion

This study examined task engagement in toddlers' and preschoolers' performance during challenging puzzle tasks in the presence of primary caregivers and explored hypothesized relationships between infant temperament, as well as parental responsiveness and acceptance, at 6 months on children's task engagement at 24 and 35 months. We identified an interpretable task engagement factor in children's performance during a challenging puzzle task at both time points. This task engagement factor is loaded by measures associated with behavioral (compliance and persistence), emotional (positive mood and enthusiasm), and cognitive (persistence) processes. As additional evidence of construct validity, we also found that this task engagement factor was predicted by infant attention and parental responsiveness at 6 months after controlling for demographic factors. In addition, we identified a challenging behavior factor

during the puzzle tasks at both time points, which included negative mood, aggression, and compliance as negatively loaded. This factor was inversely predicted by parental acceptance at 6 months after controlling for the demographic factors.

Task Engagement Factor

The first contribution of the current study is in providing construct validity evidence (through a measurement model) for a potential task engagement factor in children's approaches to challenging problem-solving tasks that might be relevant to children's later engagement in academic tasks. Although there is a substantial body of literature on school or academic engagement among school-aged children (e.g., Fredricks et al., 2011), a gap remains in understanding the developmental origins of academic engagement during developmentally appropriate tasks in the early childhood years (Fredricks et al., 2004). In addition, although studies on separate aspects of child performance during challenging problem-solving or puzzle tasks exist (e.g., Davis et al., 2004; Egeland et al., 1983; Harris et al., 2007), this is one of the first studies that took advantage of the observed child codes in the measurement system to examine the theorized underlying construct of task engagement encompassing separate child variables across the behavioral, emotional, and cognitive aspects. For example, in the studies by both Davis et al. (2004) and Harris et al. (2007), children's problem-solving behavior during parent-child and child-alone puzzle tasks was observed, and child attention regulation was the child construct of interest. However, child attention regulation was assessed based on the proportion of child gazes at the puzzles that were self-regulated (i.e., the child independently gazed at the model puzzle that was used as an example for the child to copy) rather than other regulated (i.e., the child gazes were based on of parent's direction or suggestion). In the study by Egeland et al. (1983), a set of problem-solving tasks were administered to the parent-child dyads with child persistence, enthusiasm for the tasks, anger/negativity, and compliance assessed. These separate child variables, as indicators of emotional and social adjustment, were each compared across groups of children who experienced different forms of maltreatment during their early childhood years.

The present study provides preliminary construct validity evidence for an invariant task engagement factor indicated by toddlers' and preschoolers' positive mood, enthusiasm, persistence, and compliance during challenging puzzle tasks consistent with the motivational perspective

of engagement that incorporates behavioral, emotional, and cognitive processes for school-aged students (Skinner et al., 2009; M. Wang & Degol, 2014). Evidence for such a factor during challenging puzzle tasks enables us to theorize that young children's task engagement in challenging tasks could be a potential developmental precursor of students' academic engagement for four reasons.

First, both school engagement and engagement in challenging tasks in early childhood have theoretical support from Skinner et al.'s (2009) framework of viewing engagement as an organizational construct in the dynamic development of motivation for mastery of skills or knowledge. Second, both engagement constructs encompass behavioral, emotional, and cognitive components. The existence of a multicomponent construct of task engagement in toddlerhood and preschool appears valid given it is consistent with developmental theories about children's milestones in achieving their rudimentary self-regulation independently across domains during those periods (Sroufe & Waters, 1976). Third, both engagement constructs emphasize challenging tasks that elicit children's behavioral, emotional, and cognitive efforts toward goal pursuits (Fredricks et al., 2004; Skinner et al., 2009). For school-aged children, the tasks are academic activities that are potentially challenging but achievable. Such challenges are deemed important by the concept of "zone of proximal development" in the social-cultural theory of cognitive development (Vygotsky, 1978), in the study of mastery motivation (Messer, 1993), and in the emphasis on developmental appropriateness from developmental theories (Egeland et al., 1983; Matas et al., 1978; Sroufe, 1979). For young children, the tasks are problem-solving tasks that are potentially challenging or moderately difficult but fit children's developmental capacity. Fourth, from the measurement perspective, both engagement constructs capture the qualitative differences in children's engagement. For school-aged children, researchers assess qualitative differences between each dimension of engagement that range from merely participating to deep commitment and investment (Fredricks et al., 2004). For toddlers and preschoolers, using the global qualitative rating system of child affect and behavior during the semistructured parent-child challenging puzzle task, we captured the qualitative differences in child affect and behavior relevant to the behavioral, emotional, and cognitive components of task engagement. Future research is needed to test whether a multicomponent construct of engagement in early childhood would predict academic engagement for children at school age.

It is notable that, for the task engagement factor, the factor loadings of child persistence and child enthusiasm are stronger than those for child

positive mood and child compliance, indicating they are more dominant factor indicators than are positive mood and compliance for children at 2–3 years of age. This pattern of loadings aligns well with the report by Skinner et al. (2009). Specifically, attempts, absorption, concentration at the behavioral dimension and thoroughness, goal striving, and strategy search at the cognitive dimension in Skinner et al. (2009) are all elements of child persistence as coded in the current study. Interest, enjoyment, and satisfaction in the emotional dimension in Skinner et al. (2009) are all elements of child enthusiasm as coded in the current study. However, for positive mood, there were occasions when a child showed positive affect and body movements but did not necessarily pursue the goal of puzzle solving. There were also occasions when a child was compliant but not interested in the puzzle solving. These examples might partially explain the relative higher loading of child persistence and enthusiasm but weaker loadings of positive mood and compliance.

Admittedly, other theoretical perspectives exist in understanding child performance during challenges. For example, emotion regulation literature highlights persistence during challenges, together with compliance with caregivers and frustration tolerance, as hallmarks of children's emotional self-regulation during the preschool years (Dennis, 2006). Duncan et al. (2007) regarded persistence and enthusiasm as important aspects of children's self-regulation. Temperament researchers have considered task persistence as an indicator of effortful control (Rothbart, Ahadi, & Evans, 2000), and other researchers have included task persistence in the broader category of executive function, representing self-regulated cognition, attention, and behavior (Anderson, 2002). The literature on children's approaches to learning also has frequently referred to enthusiasm for learning, persistence, and focused attention as defining characteristics of approaches to learning related to school readiness (Hyson, 2008).

Nevertheless, our study is the first to uncover an early task engagement factor during challenging problem-solving tasks guided by both the organizational perspective of development and the motivational perspective of student engagement. Identifying this early task engagement factor in the face of challenges provides a potential candidate for better understanding how manifested action-based motivation for competency and learning might have emerged in early childhood.

Identifying a task engagement factor based on challenging problem-solving tasks also contributes to the engagement literature in early childhood. Specifically, our qualitative rating system supplements the current continuous, interval-based, or momentary time-sampling observational

systems in early childhood that are based on varied activities and focus on the duration or frequency of target behavior (e.g., McWilliam & Casey, 2008). Although another global qualitative rating system (inCLASS; Downer et al., 2010) has been developed with an engagement code, this engagement construct is operationalized as an overall rating of children's sustained attention and active participation in activities and does not focus on children's behavioral and emotional efforts in their engagement. In addition, this engagement code is applied during activities that may or may not motivate or challenge to children. In future studies, it will be important to test empirically whether task engagement during challenging problem-solving tasks in early childhood predicts academic engagement among school-aged children above and beyond other child and parent influences.

Challenging Behavior Factor

We identified another factor in children's performance during challenging puzzle tasks: a challenging behavior factor as loaded by negative mood, aggression, and compliance (negative loading) at both 24 and 35 months. The emergence of this additional factor is not surprising given that, in the puzzle task, children were asked to work on predefined puzzles in which they needed to align their own interest with the goal of the task, exercise problem solving, and exert efforts to complete the task. Children who were unable to adjust to the expectation of the task were likely to feel frustrated and displayed a range of challenging behavior. The factor indicators are also consistent with the literature that defines challenging behavior in early childhood as including both disruptive and emotional problems (Gardner & Shaw, 2008). Children who do not comply with task demands or caregivers' directives may show either disruptive behavior such as aggression or emotional tantrums, as well as fussing or whining. Therefore, noncompliance is also an indicator of the challenging behavior factor in our study.

Challenging behavior such as aggression and noncompliance is likely to decrease as children grow with more capacities in behavioral and emotional control and more internalization of rules and acceptable conduct (Campbell, 2002). It is noteworthy that Skinner et al. (2009) also discussed a construct of disaffection, which also includes behavioral (e.g., giving up, distracted), emotional (e.g., boredom, sadness, worry/anxiety), and cognitive (e.g., aimless, opposition, avoidance) dimensions. The challenging behavior construct included variables relevant to some dimensions

of disaffection. For example, aggression and noncompliance may reflect opposition in the cognitive dimension of disaffection, and negative mood may reflect sadness and anxiety in the emotional dimension of disaffection. The challenging behavior factor that emerged in the current analysis might be a related factor or a precursor of academic disaffection in school-aged students. Further research may be directed to investigate such a potential linkage.

Child compliance positively loaded on the task engagement factor but negatively on the challenging behavior factor. This might suggest that, in early childhood, the ability to accept and follow parents' directions is relevant to both task engagement and behavior regulation. In our puzzle task, parents were present and allowed to help as they deemed necessary, which led to the possibility of parental directives and child reaction to the directives indicating different levels of compliance. The child compliance indicator may be important to both factors because child compliance can be either relevant (i.e., when parental directives were related to the puzzle solving, such as trying a different puzzle piece) or irrelevant (i.e., when parental directives were not about puzzle solving, such as asking the child to wipe his or her nose) to children's task efforts. When compliance is related to puzzle solving, more compliance suggests more engagement. When the compliance is not related to puzzle solving, more compliance indicates lower challenging behavior.

The significant but modest relationship between 24-month challenging behavior and 35-month challenging behavior in our study is consistent with literature that suggests a substantial number of toddlers outgrow their challenging behavior during the preschool years (Seguin & Zelazo, 2005). The decrease in challenging behavior from 24 months to 35 months is likely a function of children's increases in cognitive abilities, capabilities for self-control (Hughes & Ensor, 2009), and the socialization of behavioral control within and outside of the home (Bradley & Corwyn, 2008; Pianta, Cox, & Snow, 2007).

Predictors of Task Engagement and Challenging Behavior Factors

As further evidence of construct validity, we found some support for infant temperament and parenting behaviors as correlates of children's task engagement and challenging behavior. With respect to infant temperament, only infant attention at 6 months was a significant predictor, and it predicted only child task engagement at 24 months. This finding adds to the literature (e.g., Hill & Braungart-Rieker, 2002; Kochanska, Murray, & Harlan,

2000) that suggests infant attention is a key aspect of constitutional qualities that support children's later acquisition of regulatory capacities across emotional, behavioral, and cognitive domains that are critical for engagement in challenging tasks. The finding that none of the other temperament variables predicted either the task engagement or the challenging behavior factors also suggests those two factors are distinct from infant temperamental qualities such as either infant positive affect or infant negativity. One caveat, however, is that our temperament measure was based on observed ratings of infant behavior in a home setting by home visitors who were not very familiar with the child. Replicating such findings by using alternative temperament measures such as maternal report of infant temperament would be important to clarify further the extent to which infant temperament is related to task engagement.

We found that maternal responsiveness predicted children's task engagement at 35 months after accounting for the effect of 24-month task engagement, challenging behavior, and other covariates. Maternal responsiveness also has been found to be predictive of children's emotional security, social competence, and intellectual outcomes (Ainsworth, Bell, & Stayton, 1974; Paavola, Kunnari, Moilanen, & Lehtihalmes, 2005). This finding suggests that maternal responsiveness to children may be a powerful facilitator to children's task engagement over time. Emphasizing maternal responsiveness in intervention services may be important in enhancing children's behavioral, emotional, and cognitive experiences in skill mastery and in supporting their task engagement.

In addition, higher maternal acceptance of children was related to lower challenging behavior in children at 24 months, consistent with the literature that more maternal rejection is related to more problem behavior in children (Lila, Garcia & Gracia, 2007). It could be that mothers with higher acceptance of children might be likely to parent in a way that facilitates children's contentment in their activities; hence, they demonstrate low levels of negativity and challenging behavior. Mothers are low in acceptance are more likely to disapprove of children's acts and may elicit children's frustration and negativity that constitute the factor of challenging behavior.

Limitations

While we made efforts to select relevant demographic controls and child and contextual predictors of early task engagement, other variables might be worth considering for future research. First, child language skills may also be important in understanding children's early task engagement given

the relationship between language skills and children's regulatory capacities (Eisenberg, Sadovsky, & Spinrad, 2005), which are critical in children's task engagement. Second, because the puzzle tasks were designed intentionally to have the primary caregiver accompany the child, we should interpret the task engagement construct as task engagement with the presence of the primary caregiver. We chose to have the primary caregiver accompany the child because of the theoretical consideration that children's development of self-regulation begins with dyadic or other regulation in early childhood (Egeland et al., 2002). Future research may be directed to examining children's early task engagement during challenging puzzle tasks without interaction with their caregivers.

The scope of the present study did not involve conducting cross-validation of the task engagement factor with other similar or different samples. Nevertheless, we were able to conduct post hoc split-half analyses by randomly splitting the study sample into two subsamples of equal sample size and conducting the same analyses with each subsample. The findings from both subsamples supported a task engagement factor with the same factor structure as was obtained with the larger sample, which is preliminary evidence of replicability of the task engagement factor. Still, cross-validation with other samples of similar tasks and variables is needed so as to replicate the challenging puzzle tasks as a tool to assess and foster coordination of behavioral, emotional, and cognitive efforts in solving challenging tasks.

Finally, several other factors can be considered in exploring the task engagement construct, such as the duration of time that children spend working on a task, the number of puzzles children were able to complete during the designated 10 min, and level of parental assistance during the challenging puzzle solving. Due to the lack of data on these aspects, we were unable to consider these factors as related to children's task engagement effort. Future research may benefit from exploring these variables in relation to task engagement.

Overall, our study supports a construct of task engagement during puzzle tasks with primary caregivers in early childhood, as well as the construct of challenging behavior. By identifying task engagement as a latent construct during challenging puzzle tasks with qualitative differences across the behavioral, emotional, and cognitive processes, we will be able to further explore in future research whether academic engagement has a developmental origin in young children's early task engagement during challenging puzzle tasks, as well as the continuity and discontinuity from early task engagement to later academic engagement. The additional finding of a challenging behavior factor may also stimulate future research

regarding how challenging behavior during challenging problem-solving tasks may be related to disaffection or disengagement from challenging preacademic or academic tasks.

Findings on the child and environmental predictors of toddlers' and preschoolers' task engagement and challenging behavior provide further evidence for the construct validity of the task engagement factor and suggest that engagement is a malleable factor that can be either strengthened or compromised during interactions with parents. Early interventions might focus on improving parents' responsiveness to and acceptance of the child, supporting children's behavior associated with task engagement, and mitigating behavior markers associated with challenging behavior. The acquired task engagement capacity, when established early, might become a resilience factor within the child that results in a positive learning trajectory in preschool and later in school (Fredricks et al., 2004). Future studies may benefit from evaluating the continuity of young children's task engagement and school-aged children's academic engagement, as well as the effect of early task engagement on school readiness, later learning, and social outcomes.

References

- Ainsworth, M. D. S., Bell, S. M., & Stayton, D. J. (1974). Infant–mother attachment and social development: “Socialization” as a product of reciprocal responsiveness signals. In M. P. M. Richards (Ed.), *The integration of a child into a social world* (pp. 99–135). London: Cambridge University Press.
- Anderson, P. (2002). Assessment and development of executive function (EF) during childhood. *Child Neuropsychology*, 8, 71–82. doi:10.1076/chin.8.2.71.8724
- Bayley, N. (1969). *Bayley Scales of Infant Development*. New York: Psychological Corporation.
- Berry, D., Blair, C., Ursache, A., Willoughby, M., Granger, D. A., & Family Life Project Key Investigators. (2014). Early childcare, executive functioning, and the moderating role of early stress physiology. *Developmental Psychology*, 50, 1250–1261. doi:10.1037/a0034700
- Bradley, R. H., & Corwyn, R. F. (2008). Infant temperament, parenting, and externalizing behavior in first grade: A test of the differential susceptibility hypothesis. *Journal of Child Psychology and Psychiatry*, 49, 124–131. doi:10.1111/j.1469-7610.2007.01829.x
- Caldwell, B., & Bradley, R. (1984). *Home observation for measurement of the environment* (rev. ed.). Little Rock: University of Arkansas at Little Rock.
- Campbell, S. B. (2002). *Behavior problems in preschool children: Clinical and developmental issues* (2nd ed.). New York: Guilford Press.

- Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling, 9*, 233–255. doi:10.1207/S15328007SEM0902_5
- Cicchetti, D., & Sroufe, L. A. (1976). The relationship between affective and cognitive development in Down's syndrome infants. *Child Development, 47*, 920–929.
- Cox, M. (1997). *Qualitative ratings: Parent/child interaction at 24–36 months of age*. Unpublished coding manual.
- Cox, M. (2007). *Family life project instrument documentation: Infant/toddler HOME, preschool HOME*. Unpublished instrument documentation, University of North Carolina at Chapel Hill, Chapel Hill, NC.
- Davis, D. W., Burns, B., Snyder, E., Dossett, D. M., & Wilkerson, S. A. (2004). Parent-child interaction and attention regulation in children born prematurely. *Journal for Specialists in Pediatric Nursing, 9*, 85–94. doi:10.1111/j.1547-5069.2004.00085.x
- Dennis, T. (2006). Emotional self-regulation in preschoolers: The interplay of child approach reactivity, parenting, and control capacities. *Developmental Psychology, 42*, 84–97. doi:10.1037/0012-1649.42.1.84
- Downer, J. T., Booren, L. M., Lima, O. K., Luckner, A. E., & Pianta, R. C. (2010). The individualized classroom assessment scoring system (inCLASS): Preliminary reliability and validity of a system for observing preschoolers' competence in classroom interactions. *Early Childhood Research Quarterly, 25*, 1–16. doi:10.1016/j.ecresq.2009.08.004
- Duncan, G. J., Dowsett, C. J., Claessens, A., Magnuson, K., Huston, A. C., Klebanov, P. K., . . . Japel, C. (2007). School readiness and later achievement. *Developmental Psychology, 43*, 1428–1446. doi:10.1037/0012-1649.43.6.1428
- Egeland, B., Bosquet, M., & Levy-Chung, A. K. (2002). Continuities and discontinuities in the intergenerational transmission of child maltreatment: Implications for breaking the cycle of abuse. In K. Browne, H. Hanks, P. Stratton, & C. Hamilton (Eds.), *The prediction and prevention of child abuse: A handbook* (pp. 217–232). New York: John Wiley & Sons.
- Egeland, B., Sroufe, L. A., & Erickson, M. (1983). The developmental consequence of different patterns of maltreatment. *Child Abuse & Neglect, 7*, 459–469. doi:10.1016/0145-2134(83)90053-4
- Eisenberg, N., Sadovsky, A., & Spinrad, T. L. (2005). Associations of emotion-related regulation with language skills, emotion knowledge, and academic outcomes. *New Directions for Child and Adolescent Development, 109*, 109–118. doi:10.1002/cd.143
- Erickson, S. J., & Lowe, J. R. (2008). The role of maternal responsiveness in predicting infant affect during the still face paradigm with infants born very low birth weight. *Infant Mental Health Journal, 29*, 114–132. doi:10.1002/imhj.20172

- Fox, N. A. (1998). Temperament and regulation of emotion in the first years of life. *Pediatrics, 102*, 1230–1235.
- Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of Educational Research, 74*, 59–109. doi:10.3102/00346543074001059
- Fredricks, J. A., McColskey, W., Meli, J., Mordica, J., Montrosse, B., & Mooney, K. (2011). *Measuring student engagement in upper elementary through high school: A description of 21 instruments* (REL–No. 098). Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Southeast. Retrieved from https://ies.ed.gov/ncee/edlabs/regions/southeast/pdf/REL_2011098.pdf
- Gardner, F., & Shaw, D. S. (2008). Behavioral problems of infancy and preschool children (0–5). In M. Rutter et al. (Eds.), *Rutter's child and adolescent psychiatry* (5th ed.). London: Blackwell.
- Grolnick, W. S. (2003). *The psychology of parental control: How well-meant parenting backfires*. Mahwah, NJ: Erlbaum.
- Harris, R. C., Robinson, J. B., Chang, F., & Burns, B. M. (2007). Characterizing preschool children's attention regulation in parent-child interactions: The roles of effortful control and motivation. *Journal of Applied Developmental Psychology, 28*, 25–39. doi:10.1016/j.appdev.2006.10.006
- Harter, S. (1975). Developmental differences in the manifestation of mastery motivation on problem-solving tasks. *Child Development, 46*, 370–378. doi:10.2307/1128130
- Hemmeter, M. L., Fox, L., & Snyder, P. (2013). A tiered model for promoting social-emotional competence and addressing challenging behavior. In V. Buisse & E. S. Peisner-Feinberg (Eds.), *Handbook of response to intervention in early childhood* (pp. 85–102). Baltimore, MD: Brookes.
- Hill, A. L., & Braungart-Rieker, J. M. (2002). Four-month attentional regulation and its prediction of three-year compliance. *Infancy, 3*, 261–273. doi:10.1207/S15327078IN0302_9
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*, 1–55. doi:10.1080/10705519909540118
- Hughes, C., & Ensor, R. (2009). Independence and interplay between maternal and child risk factors for preschool problem behaviors. *International Journal of Behavioral Development, 33*, 312–322. doi:10.1177/0165025408101274
- Hyson, M. (2008). *Enthusiastic and engaged learners: Approaches to learning in the early childhood classroom*. New York: Teachers College Press; and Washington, DC: National Association for the Education of Young Children.
- Kline, R. B. (2011). *Principles and practices of structural equation modeling* (3rd ed.). New York: Guilford Press.

- Kochanska, G. (1993). Toward a synthesis of parental socialization and child temperament in early development of conscience. *Child Development, 64*, 325–347. doi:10.1111/j.1467-8624.1993.tb02913.x
- Kochanska, G., Murray, K., & Harlan, E. (2000). Effortful control in early childhood: Continuity and change, antecedents and implications for social development. *Developmental Psychology, 36*, 220–232. doi:10.1037/0012-1649.36.2.220
- Lila, M., Garcia, F., & Gracia, E. (2007). Perceived paternal and maternal acceptance and children's outcomes in Colombia. *Social Behavior and Personality, 35*, 115–124. doi:10.2224/sbp.2007.35.1.115
- Luby, J. L., Sullivan, J., Belden, A., Stalets, M., Blankenship, S., & Spitznagel, E. (2006). An observational analysis of behavior in depressed preschoolers: Further validation of early-onset depression. *Journal of the American Academy of Child and Adolescent Psychiatry, 45*, 203–212. doi:10.1097/01.chi.0000188894.54713.ee
- Matas, L., Arend, R. A., & Sroufe, L. A. (1978). Continuity of adaptation in the second year: The relationship between quality of attachment and later competence. *Child Development, 49*, 547–556. doi:10.2307/1128221
- McDermott, P. A., Rikoon, S. H., & Fantuzzo, J. W. (2014). Tracing children's approaches to learning through Head Start, kindergarten, and first grade: Different pathways to different outcomes. *Journal of Educational Psychology, 106*, 200–213. doi:10.1037/a0033547
- McWilliam, R. A., & Bailey, D. B. (1992). Promoting engagement and mastery. In D. B. Bailey Jr. & M. Wolery (Eds.), *Teaching infants and preschoolers with disabilities* (2nd ed., pp. 229–256). Upper Saddle River, NJ: Prentice Hall.
- McWilliam, R. A., & Casey, A. M. (2008). *Engagement of every child in the pre-school classroom*. Baltimore, MD: Brookes.
- Messer, D. J. (1993). Mastery, attention, IQ and parent-infant social interaction. In D. J. Messer (Ed.), *Mastery motivation in early childhood: Development, measurement and social processes* (pp. 19–35). London: Routledge.
- Molenaar, P. C. M., & Lerner, R. M. (2013). *Handbook of developmental systems theory and methodology*. New York: Guildford Press.
- Muthén, L. K., & Muthén, B. O. (1998–2012). *Mplus user's guide* (7th ed.). Los Angeles: Muthén & Muthén.
- National Institute of Child Health and Human Development Early Child Care Research Network (NICHD ECCRN). (1999). Child care and mother-child interaction in the first 3 years of life. *Developmental Psychology, 35*, 1399–1413. doi:10.1016/S0163-6383(03)00035-3
- Odom, E. C., Garrett-Peters, P., Vernon-Feagans, L., & Family Life Project (FLP) Investigators. (2014). Racial discrimination as a correlate of African American mothers' emotion talk to young children. *Journal of Family Issues, 35*, 1–27. doi:10.1177/0192513X14521196

- Paavola, L., Kunnari, S., Moilanen, I., & Lehtihalmes, M. (2005). The functions of maternal verbal responses to prelinguistic infants as predictors of early communicative and linguistic development. *First Language, 25*, 173–195. doi:10.1177/0142723705050341
- Pérez-Edgar, K., & Fox, N. A. (2005). A behavioral and electrophysiological study of children's selective attention under neutral and affective conditions. *Journal of Cognition and Development, 6*, 89–118. doi:10.1207/s15327647jcd0601_6
- Pianta, R. C., Cox, M. J., & Snow, K. L. (2007). *School readiness and the transition to kindergarten in the era of accountability*. Baltimore, MD: Brookes.
- Rothbart, M. K., Ahadi, S. A., & Evans, D. E. (2000). Temperament and personality: Origins and outcomes. *Journal of Personality and Social Psychology, 78*, 122–135. doi:10.1037/0022-3514.78.1.122
- Satorra, A., & Bentler, P. M. (2001). A scaled difference chi-square test statistic for moment structure analysis. *Psychometrika, 66*, 507–514. doi:10.1007/BF02296192
- Seguin, J. R., & Zelazo, P. D. (2005). Executive function in early physical aggression. In R. E. Tremblay, W. W. Hartup, & J. Archer (Eds.), *Developmental origins of aggression* (pp. 307–329). New York: Guilford Press.
- Shigeto, A., Mangelsdorf, S. C., & Brown, G. L. (2013). Roles of family cohesiveness, marital adjustment, and child temperament in predicting child behavior with mothers and fathers. *Journal of Social and Personal Relationships, 31*, 200–220. doi:10.1177/0265407513490586
- Skinner, E. A., Kindermann, T. A., Connell, J. P., & Wellborn, J. G. (2009). Engagement and disaffection as organizational constructs in the dynamics of motivational development. In K. Wentzel & A. Vigfield (Eds.), *Handbook of motivation at school* (pp. 223–245). New York: Routledge.
- Spinrad, T. L., Eisenberg, N., Silva, K. M., Eggum, N. D., Reiser, M., Edwards, A., . . . Gaertner, B. M. (2012). Longitudinal relations among maternal behaviors, effortful control and young children's committed compliance. *Developmental Psychology, 48*, 552–566. doi:10.1037/a0025898
- Sroufe, L. A. (1979). The coherence of individual development: Early care, attachment, and subsequent developmental issues. *American Psychologist, 34*, 834–841. doi:10.1037/0003-066X.34.10.834
- Sroufe, L. A., Coffino, B., & Carlson, E. A. (2010). Conceptualizing the role of early experience: Lessons from the Minnesota longitudinal study. *Developmental Review, 30*, 36–51. doi:10.1016/j.dr.2009.12.002
- Sroufe, L. A., & Waters, E. (1976). The ontogenesis of smiling and laughter: A perspective on the organization of development in infancy. *Psychological Review, 83*, 173–189. doi:10.1037/0033-295X.83.3.173

- Stifter, C. A., Spinrad, T., & Braungart-Rieker, J. (1999). Toward a developmental model of child compliance: The role of emotion regulation. *Child Development, 70*, 21–32. doi:10.1111/1467-8624.00003
- Sutherland, K. S., Conroy, M. A., Vo, A., Abrams, L., & Ogston, P. (2013). An initial evaluation of the Teacher–Child Direct Observation System: Measuring teacher–child interaction behaviors in classroom settings. *Assessment for Effective Intervention, 39*, 12–23. doi:10.1177/1534508412463814
- Tamis-LeMonda, C., Briggs, R., McClowry, S. G., & Snow, D. L. (2009). Maternal control and sensitivity, child gender, and maternal education in relation to children's behavioral outcomes in African American families. *Journal of Applied Developmental Psychology, 30*, 321–331. doi:10.1016/j.appdev.2008.12.018
- Vernon-Feagans, L., & Cox, M. (2013). Poverty, rurality, parenting, and risk: An introduction. *Monographs of the Society for Research in Child Development, 78*, 1–23. doi:10.1111/mono.12047
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.
- Wang, F., Cox, M., Mills-Koonce, R., & Snyder, P. (2015). Parental behaviors and beliefs, child temperament, and attachment disorganization. *Family Relations, 64*, 191–204. doi:10.1111/fare.12120
- Wang, M., & Degol, J. (2014). Staying engaged: Knowledge and research needs in student engagement. *Child Development Perspectives, 3*, 137–143. doi:10.1111/cdep.12073
- Waters, E., & Sroufe, L. A. (1983). Social competence as a developmental construct. *Developmental Review, 3*, 79–97. doi:10.1016/0273-2297(83)90010-2
- Widaman, K. F., Ferrer, E., & Conger, R. D. (2010). Factorial invariance within longitudinal structural equation models: Measuring the same construct across time. *Child Development Perspectives, 4*, 10–18. doi:10.1111/2Fj.1750-8606.2009.00110.x
- Young, J. M., & Hauser-Cram, P. (2006). Mother-child interaction as a predictor of mastery motivation in children with disabilities born preterm. *Journal of Early Intervention, 28*, 252–263. doi:10.1177/105381510602800402

Children's Shyness, Peer Acceptance, and Academic Achievement in the Early School Years

Linlin Zhang, Natalie D. Eggum-Wilkens, Nancy Eisenberg, and Tracy L. Spinrad *Arizona State University*

In this two-wave longitudinal study, concurrent and longitudinal relations among teacher-reported shyness, peer acceptance, and academic achievement were examined ($N_s = 162$ and 155 ; and $M_{s_{age}} = 6.09$ and 7.07 years). Concurrently, at both times, shyness was negatively related to peer acceptance and academic achievement, and peer acceptance was positively related to academic achievement. Longitudinally, shyness was negatively related to peer acceptance, and peer acceptance was positively related to academic achievement in zero-order correlations, but the relations were no longer significant when accounting for the stability of the constructs. Longitudinal relation between shyness and academic achievement was nonsignificant; however, shyness was indirectly linked to concurrent and later academic achievement through peer acceptance according to bias-corrected bootstrapped confidence intervals. Sex differences in the relations were mixed. These results suggested that a lack of peer acceptance may be a mechanism through which shyness contributed to poor academic achievement in the early school years.

Shy children are wary and anxious in novel social situations or situations in which they believe that they will be socially evaluated (Coplan, Prakash, O'Neil, & Armer, 2004). Shy children are believed to desire social contact but are also anxious or afraid to approach others (Asendorpf, 1990).

Linlin Zhang, Natalie D. Eggum-Wilkens, and Tracy L. Spinrad, T. Denny Sanford School of Social and Family Dynamics; and Nancy Eisenberg, Department of Psychology.

This project was funded by National Institute of Mental Health grants awarded to Nancy Eisenberg and Tracy L. Spinrad (MH060838). The authors thank the students who contributed to this project, as well as the children and teachers for their participation.

Address correspondence to Natalie D. Eggum-Wilkens, T. Denny Sanford School of Social and Family Dynamics, Arizona State University, PO Box 873701, Tempe, AZ 85287-3701. Phone: (480) 727-6899. Fax: (480) 965-6779. E-mail: Natalie.Wilkens@asu.edu.

Merrill-Palmer Quarterly, October 2017, Vol. 63, No. 4, pp. 458–484. doi: 10.13110/merrpalmquar 1982.63.4.0458 Copyright © 2018 by Wayne State University Press, Detroit, MI 48201.

The approach–avoidance conflict is thought to put shy children at risk for adjustment problems, especially in the socioemotional domain (e.g., peer exclusion, loneliness; Arbeau, Coplan, & Weeks, 2010; Eggum-Wilkens, Valiente, Swanson, & Lemery-Chalfant, 2014). Shy children also have been found to have poor language performance, especially expressive language (Spere & Evans, 2009), but whether or how shyness is related to academic achievement is still unclear.

It is important to study shy children's social and academic adaptation during the early school years because successful adaptation during this period can predict later school adjustment (Duncan et al., 2007; Ladd & Dinella, 2009), and the transition to elementary school may be particularly challenging for shy children. Thus, in this longitudinal study, we examined the concurrent and longitudinal relations among shyness, peer acceptance, and academic achievement in the early school years. We also explored peer acceptance as a potential mechanism providing an indirect link between shyness and academic achievement.

Shyness and Peer Acceptance

Peer acceptance refers to the extent to which a child is liked by peers. Peer acceptance is often related to, but not redundant with, peer rejection, which is the extent to which a child is disliked by peers (Bukowski, Sippola, Hoza, & Newcomb, 2000). Shyness may be more strongly associated with the lack of peer acceptance than with peer rejection. For instance, peers may not prefer shy children but not necessarily feel negatively about them. Peer exclusion reflects a passive, negative treatment toward children by not including them in group activities, and exclusion can arise from peer rejection or a lack of peer acceptance.

In Western culture, shyness is inconsistent with many attributes associated with peer acceptance (e.g., good communication). For instance, shy children have been observed to spend less time in, and talk less during, conversations (Asendorpf & Meier, 1993). Shy children also have been found to have low perceived social competence and difficulties initiating and maintaining positive relationships with peers (Coplan & Armer, 2005; Ladd, Kochenderfer-Ladd, Eggum, Kochel, & McConnell, 2011). Moreover, peers may view shy or quiet children as less approachable than talkative children and may actively avoid interactions with shy children (Coplan, Girardi, Findlay, & Frohlick, 2007). Thus, shyness may be expected to relate negatively to peer acceptance.

Empirically, concurrent associations of shyness with low peer acceptance, as well as with high exclusion and rejection (which often indicate

a lack of acceptance), have been found as early as preschool and throughout childhood. For example, in preschoolers, parent-reported shyness has been negatively related to teacher-rated popularity and positively to teacher-reported peer rejection and exclusion (Coplan et al., 2004; Sette, Baumgartner, & Schneider, 2014). Positive concurrent associations between teacher-reported anxious solitude, which measures shyness with familiar peers, and teacher-reported peer exclusion also have been reported from kindergarten up to fourth grade (Gazelle & Ladd, 2003).

Longitudinally, mother-reported and caregiver-reported anxious solitude at 2–4½ years old and mother-reported shyness at the start of first grade have been related to low teacher-rated peer acceptance, as well as high peer rejection and exclusion in first grade (Arbeau et al., 2010; Gazelle, 2006), although the associations were only small to moderate. Similarly, parent-rated and teacher-rated shyness in kindergarten has been associated negatively with teacher ratings of peer acceptance in first grade (Eggum-Wilkens et al., 2014). However, stability of peer relationships was not controlled in these studies. Using a person-centered approach, Gazelle and Ladd (2003) reported that anxious–solitary children were likely to have an elevated trajectory of peer exclusion, above and beyond early peer rejection, from kindergarten to fourth grade.

Significant associations between shyness and peer acceptance have not always been found, particularly when peer acceptance was reported by young children or by parents. For example, sometimes parent-rated shyness was not related to children’s perceived acceptance in preschool (Coplan & Armer, 2005; Sette et al., 2014). In a study of kindergarteners, observers’ and teachers’ ratings of shyness–withdrawal were negatively related to teacher-perceived peer acceptance but not related to self-, peer-, or parent-perceived peer acceptance (Phillipsen, Bridges, McLemore, & Saponaro, 1999).

Peer Acceptance and Academic Achievement

Wentzel (2009) has proposed that peer relationships are an important socialization context of children’s academic achievement at school. For example, peers may exert positive influences through providing instrumental and emotional supports that facilitate children’s academic motivation and academic engagement. Theoretically, peers also may have a negative influence; for example, poor relationships with peers may discourage children’s academic motivation and engagement.

Empirically, peer acceptance has been positively related to concurrent academic achievement in elementary-school children (Austin & Draper,

1984; Green, Forehand, Beck, & Vosk, 1980). Longitudinal relations between peer acceptance (or a lack of) and later academic performance also have been reported (Flook, Repetti, & Ullman, 2005; Ladd, 1990; O'Neil, Welsh, Parke, Wang, & Strand, 1997). For example, in kindergarten, peer acceptance in the fall has been positively related to academic performance in the spring (Buhs & Ladd, 2001; Ladd, Birch, & Buhs, 1999). Peer acceptance in kindergarten also has predicted later academic performance in kindergarten (Ladd, Kochenderfer, & Coleman, 1997) and elementary-school years (Buhs, Ladd, & Herald, 2006), after adjusting for previous academic performance. Moreover, peer acceptance has predicted academic readiness above and beyond dyadic friendships and peer victimization (Ladd et al., 1997), which suggests that peer acceptance may be particularly relevant to academic adjustment.

Shyness and Academic Achievement: The Potential Mediation Through Peer Acceptance

Due to the limited research on shyness and academic performance, particularly during the early school years, we reviewed a broader body of literature (e.g., social withdrawal) during childhood in Western culture. Although shy children do not necessarily have a lower IQ, they may encounter academic difficulties because of characteristics related to shyness. For example, shy children may have poor language skills (especially expressive verbal abilities; Evans, 2010; Smith Watts et al., 2014), which not only are part of academic performance but also may interfere with the learning of non-language subjects (e.g., because they may have difficulty asking questions). Shy children also have been found to have low confidence in their academic competence (Chen et al., 2004), and this deficit may undermine their demonstration of academic skills and performance.

Empirical evidence linking shyness and related constructs to poor academic achievement occasionally has been reported (Evans, 2010). Teacher-reported social withdrawal has been negatively associated with concurrent math abilities in kindergarten (Dobbs, Doctoroff, Fisher, & Arnold, 2006) and academic grades in third grade (Green et al., 1980). Teacher-rated anxious withdrawal in kindergarten also has been related to poor math and language grades in first grade (stability was not controlled; Normandeau & Guay, 1998).

However, it should be noted that shyness is not identical to social withdrawal. The association between shyness and academic performance has not been examined frequently, and the existing findings are not entirely consistent. For example, Hughes and Coplan (2010) reported

that in fourth to sixth graders, self-reported shyness was negatively associated with concurrent teacher-rated, but not standardized test scores of, reading and math (nonverbal IQ was controlled). Crozier and Hostettler (2003) found that shy fifth graders performed poorer than nonshy peers on a vocabulary test but not on an arithmetic test, and the difference in vocabulary was larger in face-to-face test conditions than in group settings.

Researchers have explored the mediational mechanisms that link shyness and academic achievement. For example, Hughes and Coplan (2010) found that the concurrent association between self-reported shyness and teachers' ratings of academic performance was partially mediated by academic engagement (e.g., listens attentively) in middle to late elementary-school years. Walker and Henderson (2012) did not find significant relations between caregiver-reported or mother-reported shyness at 54 months and academic ratings at kindergarten or first grade, but there was indirect prediction of a latent composite of academic performance at kindergarten and first grade by shyness through children's social problem-solving skills at 54 months (not controlling for earlier academic performance).

We believe that shyness may relate to academic performance indirectly through peer acceptance for several reasons. Instrumentally, shy children are likely less accepted by peers and thus may have fewer resources from which they can draw when they encounter academic difficulties, such as assistance with schoolwork (Wentzel, 2009). Emotionally, the lack of positive peer relationships may put shy children at risk for negative treatment by peers (Buhs & Ladd, 2001) and for developing a negative attitude toward school (Eggum-Wilkens et al., 2014), which also interfere with academic performance. Motivationally, lacking positive peer connections may discourage shy children's motivation for academic success, which then relates to decreased academic performance (Eisenberg, Sadovsky, & Spinrad, 2005). Behaviorally, due to the lack of positive peer relationships, shy children may be less engaged in academic activities, such as participation in discussion (e.g., Eggum-Wilkens et al., 2014), which in turn has been related to poorer later academic achievement (Ladd, Herald-Brown, & Reiser, 2008). These processes may also be interrelated. For example, shy children's emotional stress aroused by negative peer experiences may undermine their academic motivation and further reduce their engagement in academic activities.

Although the mediating role of peer acceptance in the association between shyness and academic achievement has not, to our knowledge, been examined empirically, peer acceptance and rejection have been important mediators linking other social behaviors (prosocial and

antisocial) with academic engagement and achievement (Ladd et al., 1999). For example, in a recent study, peer rejection in first grade was found to mediate the association between shyness at 54 months and classroom engagement (academic and social) in first grade, although the direction of the mediation—shyness related negatively to peer rejection, and peer rejection related negatively to engagement—was surprising (Buhs, Rudasill, Kalutskaya, & Griese, 2015). The negative relation between shyness and peer rejection was contrary to most findings reported in the literature. The size of the correlation was small but significant in their large sample.

Sex as a Moderator

It has been suggested that shy boys are more at risk for negative outcomes than are shy girls because shyness is less compatible with male stereotypes (Doey, Coplan, & Kingsbury, 2014). Shyness has sometimes (Eisenberg, Shepard, Fabes, Murphy, & Guthrie, 1998), but not always (Eggum-Wilkens et al., 2014), been negatively associated with peer acceptance more strongly for boys than for girls. To our knowledge, there has not been solid evidence for the existence of sex differences in relations between shyness and academic achievement (Dobbs et al., 2006) or between peer acceptance and academic achievement (Flook et al., 2005). Due to the lack of strong theory or empirical evidence, we examined sex differences in the relations in an exploratory manner.

The Present Study

The first purpose of this two-wave longitudinal investigation was to examine the concurrent and longitudinal associations among shyness, peer acceptance, and academic achievement in the early school years. The transition to elementary school, in comparison to preschool or home care, involves adjusting to a novel, challenging environment with more complex peer interactions, increased academic demands, and higher expectations for social and academic skills, which may be particularly stressful for shy children (Coplan & Arbeau, 2008). Children's adaptation after the transition is important because peer acceptance and academic achievement have been found to be moderately stable across the elementary-school years (Jiang & Cillessen, 2005; Ladd & Dinella, 2009). Previous research in which the relations among shyness, peer acceptance, and academic achievement were examined often was conducted in later school years (e.g., third grade to sixth grade) relative to the present study. Thus, exploration of shy children's

social and academic adjustment during the early school years may provide valuable information for early prevention or intervention research.

A limitation of previous studies is that the design often has been cross-sectional, or the design was longitudinal, but analyses were conducted without controlling for stability of the key constructs. Longitudinal relations between two variables can occur in multiple ways. For example, if shyness and academic achievement are somewhat stable, an observed relation between shyness at Time 1 (T1) and academic achievement at T2 could be due to a longitudinal relation or their concurrent relations at T1 or T2. A longitudinal panel design with variables repeatedly measured is required to help interpret longitudinal relations. Including the variables at two time points enables one to determine if, for example, shyness and academic achievement are related within T1 and T2, and if T1 shyness predicts change in academic achievement from T1 to T2. Thus, with the present two-wave longitudinal panel data, we were able to examine both concurrent and longitudinal relations among the variables of interest. We hypothesized that, concurrently, shyness would relate negatively to peer acceptance and academic achievement, and peer acceptance would relate positively to academic achievement. Longitudinally, we hypothesized that shyness would relate negatively to later peer acceptance and academic achievement, and peer acceptance would relate positively to later academic achievement.

The second purpose of the study was to examine the potential mediating role of peer acceptance in the association between shyness and academic achievement. Researchers have proposed that the presence of negative, or a lack of positive, peer relationships may be responsible for shy children's poorer academic achievement (Henderson & Fox, 1998), but it has not, to our knowledge, been examined empirically. Although peer rejection has been examined as a mediator between shyness and classroom engagement (which may contribute to, but is not the same as, academic achievement), peer acceptance as a mediator in the link between shyness and academic achievement has not been examined. We examined peer acceptance as a potential mediator because positive peer relationships may be particularly relevant to children's academic performance (Ladd et al., 1997). Accepted children may feel more secure about participating in academic activities and may have more access to instrumental and emotional resources from peers when encountering academic difficulties. Thus, we hypothesized that the associations between shyness and concurrent, as well as later, low academic achievement, would be indirect through low peer acceptance.

Specifically, we examined two concurrent indirect processes: (a1) T1 shyness to T1 peer acceptance to T1 academic achievement, and (a2) T2 shyness to T2 peer acceptance to T2 academic achievement. We also examined two sets of longitudinal indirect processes. The first set of longitudinal indirect processes went through peer acceptance alone: (b1) T1 shyness to T1 peer acceptance to T2 academic achievement, and (b2) T1 shyness to T2 peer acceptance to T2 academic achievement. The second set of longitudinal indirect processes went through peer acceptance and the stability paths: (c1) T1 shyness to T2 shyness to T2 peer acceptance to T2 academic achievement (i.e., through stability of shyness), (c2) T1 shyness to T1 peer acceptance to T2 peer acceptance to T2 academic achievement (i.e., through stability of peer acceptance), and (c3) T1 shyness to T1 peer acceptance to T1 academic achievement to T2 academic achievement (i.e., through stability of academic achievement).

We examined direct relations (our first purpose), as well as potential indirect processes (our second purpose), in a path model. Zero-order correlations also informed our understanding of concurrent and longitudinal relations. Potential moderation of relations by sex was explored via a series of multiple-group path analysis models.

Teachers' reports of children's shyness, peer acceptance, and academic achievement at two ages were used in the present study (using different teachers at each time point). Teachers' reports were chosen over mothers' reports for shyness because, as reported in previous research, teachers' and mothers' ratings often are only moderately correlated (Eggum-Wilkens et al., 2014; Spangler & Gazelle, 2009), and teachers' report has been a more valid predictor of school adjustment than has mothers' report (Rudasill et al., 2014). Our sample was initially recruited from hospitals, and, at the time of the data collections used in the present study, children were in many different schools. Thus, teachers' reports were used to assess peer acceptance. Teachers have been reliable informants of young children's peer relationships in the school context, and their ratings often agree with peer nominations (Ladd et al., 2011; Vosk, Forehand, Parker, & Rickard, 1982).

Method

Participants

As a part of a larger project, participants were recruited from hospitals at birth in a large urban area in the Southwestern United States and were followed up until 7 years of age. The present study used data collected at

approximately 6 years (T1: $N = 162$; 44% girls; $M_{\text{age}} = 6.09$ years, $SD = 0.12$) and 7 years of age (T2: $N = 155$; 45% girls; $M_{\text{age}} = 7.07$ years, $SD = 0.23$), which were the only time points with peer acceptance and academic achievement data. Based on parents' reports at T1, children were primarily non-Hispanic (79%) and Caucasian (85%), but other races were represented (6% African American, 5% Native American, 3% Asian, and 1% other or unknown race). Most of the children (88%) were living with both parents. Family income ranged from less than \$15,000 to over \$100,000 per year (median = \$60,000–\$75,000; mode = over \$100,000). Mothers' and fathers' education ranged from grade school to an advanced degree (PhD, MD, or JD; median and mode = some college or a 2-year-college degree).

Thirteen children had data at T1 but not at T2. Differences between attrited and nonattrited children in demographic (sex, age, and family income) and study variables at T1 were examined by using Pearson chi-square (χ^2) tests for categorical variables and independent-samples t tests for continuous variables. Race (Caucasian versus non-Caucasian) and ethnicity (Hispanic versus non-Hispanic) differences were examined with Fisher's exact test because of a low expected cell count. The results suggested that attrited children did not differ from nonattrited children, with one exception. Attrited children came from families with a significantly lower income than did nonattrited children, $t(156) = 2.10$, $p < .05$.

At the initial data collection of the larger project (at 18 months), 255 children (45% girls; $M_{\text{age}} = 17.79$ months, $SD = .52$) participated. The majority of the participants were non-Hispanic (77%) and Caucasian (83%), but children of other races also participated (5% African American, 6% Native American, 2% Asian, 0.4% other race, 1% two-minority races, and 2% unknown race). Family income ranged from less than \$15,000 to over \$100,000 per year (median and mode = \$45,000–\$60,000). Mothers' (median = some college or a 2-year college degree; mode = 4-year-college graduation) and fathers' (median and mode = some college or a 2-year-college degree) education ranged from grade school to an advanced degree (PhD, MD, or JD).

A total of 93 participants had data at 18 months but not at the ages in the present study. Race (Caucasian versus non-Caucasian) and marital status (married vs. nonmarried), as well as mothers' and fathers' education (high school or lower vs. some college or higher), were recoded to prevent too few cases per cell. Compared to nonattrited children, attrited children had lower levels of maternal education, $\chi^2(N = 240, df = 1) = 20.99$, $p < .001$, and lower family income, $t(226) = 2.399$, $p < .05$. Attrited and nonattrited children did not differ on mother-reported shyness on the Early Childhood Behavior Questionnaire (Rothbart, 2000) at 18 months.

Procedures and Measures

The study was approved by Arizona State University's Institutional Review Board. At both assessments, primary teachers of children with written parental consent were mailed a battery of surveys around the children's birthdays. Different teachers reported on children at T1 and T2.

Shyness. Teachers rated the shyness subscale of the Children's Behavior Questionnaire (CBQ; Rothbart, Ahadi, Hershey, & Fisher, 2001). Thirteen items (e.g., "Acts shy around new people") were averaged to form a composite score (1 = *never* to 7 = *always*; α s = .94 and .94 at T1 and T2, respectively).

Peer acceptance. Teachers rated children's peer acceptance by using items adapted from Harter's (1982) Perceived Competence Scale for Children (e.g., Eisenberg et al., 1998). Three items—"This child finds it hard to make friends" (reversed), "This child is popular with others his/her age," and "This child has a lot of friends"—were averaged to form a composite score (1 = *really false* to 4 = *really true*; α s = .89 and .87 at T1 and T2, respectively). The measure has demonstrated high internal and test-retest reliability, satisfactory cross-rater correlations, high interrater correlations on a different measure of peer acceptance (e.g., "How much this child is liked by classmates"), and moderate correlation with peer-assessed social status (e.g., Eggum-Wilkens et al., 2014; Eisenberg, Fabes, Guthrie, & Reiser, 2000).

Academic achievement. Teachers rated children's overall academic performance on a 10-point "mock report card" scale (1 = *D or below* to 10 = *A +*; Pierce, Hamm, & Vandell, 1999; see Valiente et al., 2011). The validity of the assessment has been demonstrated by a high correlation with report-card grades (Graham, Updegraff, Tomascik, & McHale, 1997).

Results

Preliminary Analyses

Descriptive statistics and correlations are presented in Table 1. None of the variables was excessively skewed or kurtotic (Curran, West, & Finch, 1996). Relations between demographic and study variables were examined with independent samples *t* tests for binary variables (sex, race, and ethnicity) and correlations for continuous variables (age and family income). At T1, teachers reported higher academic achievement for girls ($M = 8.20$) than for boys ($M = 7.26$), $t(121) = 2.20$, $p < .05$. At T1, family income was positively related to peer acceptance and academic achievement, r s(128 and 118) = .18 and .23, p s $< .05$. At T2, child age was negatively related to academic achievement, $r(119) = -.22$, $p < .05$. Thus, sex, age, and family income were included as covariates of the corresponding study variables in subsequent analyses.

Table 1. Descriptive statistics and zero-order correlations

	1	2	3	4	5	6
1. Shyness T1	—					
2. Peer acceptance T1	-.40***	—				
3. Academic achievement T1	-.23*	.33***	—			
4. Shyness T2	.45***	-.24*	-.16	—		
5. Peer acceptance T2	-.38***	.39***	.26*	-.54***	—	
6. Academic achievement T2	-.13	.25**	.63***	-.31***	.38***	—
Range	1.08–6.92	1.00–4.00	1.00–10.00	1.08–6.69	1.00–4.00	1.00–10.00
<i>M</i>	3.48	3.20	7.67	3.25	3.30	7.44
<i>SD</i>	1.25	0.79	2.40	1.18	0.72	2.34
Skewness	0.16	-0.71	-1.12	0.59	-0.74	-1.03
Kurtosis	-0.58	-0.38	0.34	-0.06	-0.29	0.25
<i>N</i>	133	134	123	132	133	133

Note. T1 = 6 years and T2 = 7 years.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

The correlations were mostly consistent with our expectations regarding the stability of and the hypothesized relations among the study variables. Across years, shyness and peer acceptance were moderately stable, and academic achievement was highly stable. Concurrently, at both times, shyness was negatively correlated with peer acceptance and academic achievement, and peer acceptance was positively correlated with academic achievement. Longitudinally, shyness at T1 was negatively correlated with peer acceptance at T2, and peer acceptance at T1 was positively correlated with academic achievement at T2. However, shyness at T1 was not significantly correlated with academic achievement at T2.

The Primary Model of Interest

We estimated a single path analysis model within the structural equation modeling (SEM) framework in *Mplus* 6.12 to examine further the concurrent and longitudinal relations among shyness, peer acceptance, and academic

achievement (our primary goal), as well as examine the indirect relations between shyness and academic achievement (our secondary goal). Full information maximum likelihood (FIML) was used to reduce potential bias caused by missing data (relative to listwise or pairwise deletion). We bootstrapped the standard errors and bias-corrected confidence intervals (5,000 draws; for more detail, see section on indirect effects that follows). Model configuration is presented in Figure 1. Autoregressive paths were estimated. Moreover, the concurrent and longitudinal paths from shyness to peer acceptance and to academic achievement, and from peer acceptance to academic achievement, also were estimated. Sex, age, and family income were included as covariates as suggested by preliminary analyses. Covariances among the exogenous variables (T1 shyness and covariates) were freely estimated.

The model fit well with the data, $\chi^2(N = 168, df = 14) = 15.14, p = .37$, comparative fit index (CFI) = .99, root mean square error of approximation (RMSEA) = .02, and standardized root mean square residual (SRMR) = .04. We now describe results from this model as they pertain to each of our research goals.

Direct relations among shyness, peer acceptance, and academic achievement. Model estimates are presented in Figure 1. First, the autoregressive paths for shyness, peer acceptance, and academic achievement were all positive and significant. Second, concurrent relations among shyness, peer acceptance, and academic achievement demonstrated similar patterns at T1 and T2 (for T2 variables, corresponding T1 variables were controlled). Specifically, at both T1 and T2, shyness was negatively related to concurrent peer acceptance, and peer acceptance was positively related to concurrent academic achievement after controlling for concurrent shyness and covariates. However, the direct effect from shyness to concurrent academic achievement was not significant after controlling for concurrent peer acceptance and covariates. Finally, there was no evidence of longitudinal relations from T1 shyness to T2 peer acceptance or to T2 academic achievement, or from T1 peer acceptance to T2 academic achievement after controlling for stability of the constructs and covariates.¹

Indirect processes linking shyness and academic achievement. Potential indirect processes linking shyness and academic achievement, concurrently and longitudinally, were evaluated with 95% bias-corrected bootstrap

1. To explore the possibility that the cross-lagged relations might exist in the alternative direction, an alternative model was estimated in which longitudinal paths from academic achievement to shyness, academic achievement to peer acceptance, and peer acceptance to shyness were added to the existing model. Model fit did not improve significantly in the alternative model compared to the existing model, $\chi^2\Delta(N = 168, df = 3) = 2.60, p = .46$, and none of the added path estimates was significant.

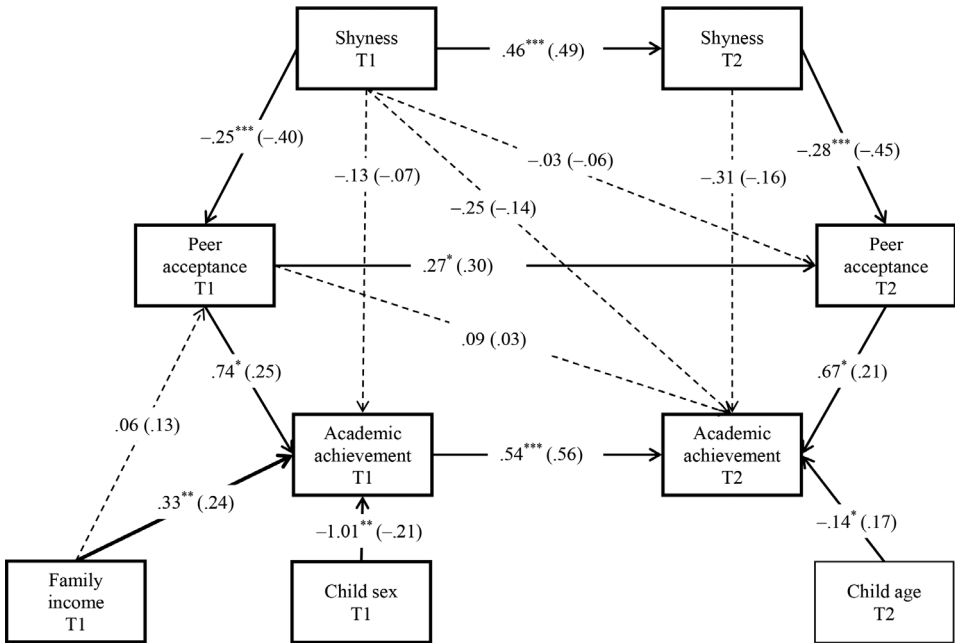


Figure 1. Path analysis of shyness, peer acceptance, and academic achievement (see Table 2 for results of indirect effects). Solid lines represent significant paths, and dashed lines represent nonsignificant paths. For each path, unstandardized estimates and associated significance levels, as well as standardized estimates (in parentheses; completely standardized estimates for continuous predictors and standardized only on Y estimates for categorical predictors) are presented. T = time. * $p < .05$, ** $p < .01$, *** $p < .001$.

confidence intervals because they provide accurate confidence intervals and high statistical power, which is most appropriate when sample size is not large (MacKinnon, Lockwood, & Williams, 2004). Total, direct, and indirect effects are considered significant when zero is not included in the confidence interval. Model results relevant to the hypothesized indirect effects are presented in Table 2.

Concurrently, there were negative and significant indirect effects from shyness to academic achievement through peer acceptance at both time points. Specifically, (a1) T1 shyness was indirectly associated with T1 academic achievement through their associations with T1 peer acceptance, and (a2) T2 shyness was indirectly associated with T2 academic achievement through their associations with T2 peer acceptance.

Table 2. Total, direct, and indirect effects of shyness on concurrent and later academic achievement

Effect	Indirect paths	Estimate	BC 95% CIs	
			Lower	Upper
Concurrent indirect effect linking T1 shyness and T1 academic achievement				
Total		-0.32	-0.66	0.04
Indirect	a1. T1 shyness to T1 peer acceptance to T1 academic achievement	-0.19**	-0.40	-0.05
Direct		-0.13	-0.53	0.26
Concurrent indirect effect linking T2 shyness and T2 academic achievement				
Total		-0.50**	-0.88	-0.12
Indirect	a2. T2 shyness to T2 peer acceptance to T2 academic achievement	-0.18*	-0.42	-0.04
Direct		-0.31	-0.71	0.07
Longitudinal indirect effects linking T1 shyness and T2 academic achievement				
Total		-0.24	-0.65	0.16
Total Indirect		-0.49**	-0.83	-0.19
Indirect effects through peer acceptance alone				
	b1. T1 shyness to T1 peer acceptance to T2 academic achievement	-0.02	-0.17	0.10
	b2. T1 shyness to T2 peer acceptance to T2 academic achievement	-0.02	-0.16	0.08
Indirect effects through peer acceptance and stability				
	c1. T1 shyness to T2 shyness to T2 peer acceptance to T2 academic achievement (through stability of shyness)	-0.09*	-0.22	-0.02
	c2. T1 shyness to T1 peer acceptance to T2 peer acceptance to T2 academic achievement (through stability of peer acceptance)	-0.05*	-0.14	-0.01
	c3. T1 shyness to T1 peer acceptance to T1 academic achievement to T2 academic achievement (through stability of academic achievement)	-0.10**	-0.24	-0.03

Continued

Table 2. Total, direct, and indirect effects of shyness on concurrent and later academic achievement (*Continued*)

Effect	Indirect paths	Estimate	BC 95% CIs	
			Lower	Upper
Indirect effects not through peer acceptance				
	T1 academic achievement	-0.07	-0.27	0.14
	T2 shyness	-0.14	-0.36	0.02
Direct		0.25	-0.12	0.64

Note. T1 = 6 years and T2 = 7 years. BC 95% CIs = bias-corrected bootstrap 95% confidence intervals.

* $p < .05$.

** $p < .01$.

Longitudinal indirect processes linking shyness and academic achievement through peer acceptance alone were not supported. Specifically, the indirect effects from T1 shyness to T2 academic achievement through (b1) T1 peer acceptance, or (b2) T2 peer acceptance, alone were not significant.

However, longitudinal indirect processes linking shyness and academic achievement through peer acceptance and the stability of the constructs was supported. Specifically, T1 shyness was negatively and indirectly associated with T2 academic achievement through three indirect paths: (c1) T1 shyness to T2 shyness to T2 peer acceptance to T2 academic achievement (i.e., through stability of shyness), (c2) T1 shyness to T1 peer acceptance to T2 peer acceptance to T2 academic achievement (i.e., through stability of peer acceptance), and (c3) T1 shyness to T1 peer acceptance to T1 academic achievement to T2 academic achievement (i.e., through stability of academic achievement).

Sex as a Moderator

Sex differences in relations among shyness, peer acceptance, and peer rejection were examined in a series of multiple-group models. Model configuration was similar to that of the primary model illustrated in Figure 1 except that sex was no longer a covariate. Instead, the models were estimated separately but simultaneously for girls and boys.

In the first set of models (comprised of three models), omnibus tests were performed on sets of estimates of interest: (a) three autoregressive paths (i.e., stability of shyness, peer acceptance, and academic achievement), (b)

six concurrent paths (i.e., concurrent associations among shyness, peer acceptance, and academic achievement), and (c) three cross-lagged paths (i.e., T1 shyness to T2 peer acceptance and T2 academic achievement, and T1 peer acceptance to T2 academic achievement). Omnibus tests examined whether, overall, the set of estimates were significantly different across boys and girls according to Wald chi-square tests. If an omnibus test was significant for a set of estimates, sex differences were then examined for individual paths in a second set of models by using Bonferroni corrections for critical p values (i.e., $\alpha = .05$ divided by the number of comparisons for each set). Sex differences in indirect effects were not estimated because of small sample sizes within boys and girls.

The multiple-group model fit well with the data, $\chi^2(Ns = 74 \text{ and } 94, df = 20) = 13.93, p = .83, CFI = 1.00, RMSEA = .00, \text{ and } SRMR = .06$. Based on the omnibus test, there was no significant sex difference in the stability of the constructs. However, an omnibus test suggested significant sex differences in the concurrent associations among shyness, peer acceptance, and academic achievement, $\chi^2(Ns = 74 \text{ and } 94, df = 6) = 21.84, p < .01$. Specifically, at T2, the concurrent relation between shyness and peer acceptance, controlling for T1 variables, was significantly different, $\chi^2(df = 1) = 9.52, p = .002$, for girls ($b = -0.07, p = .35$) and boys ($b = -0.38, p < .001$). An omnibus test also suggested significant sex differences in the longitudinal associations, $\chi^2(Ns = 74 \text{ and } 94, df = 3) = 17.79, p < .001$. Specifically, the relations between T1 shyness and T2 peer acceptance ($b = -0.21, p < .05$ for girls and $b = 0.09, p = .23$ for boys) and between T1 peer acceptance and T2 academic achievement ($b = -0.82, p = .05$ for girls and $b = 0.57, p < .05$ for boys) were significantly different across sex, $\chi^2(df = 1) = 6.95$ and $7.35, ps = .008$ and $.007$. Overall, boys and girls were similar in most of the relations under investigation, and, when sex differences were significant, no consistent pattern was observed (e.g., some relations were stronger for girls, and some relations were stronger for boys).

Discussion

The first purpose of the study was to examine the concurrent and longitudinal relations among children's shyness, peer acceptance, and academic achievement during the early school years. Consistent with the hypotheses, concurrently at both times, shyness related negatively to peer acceptance and academic achievement, and peer acceptance related positively to academic achievement. However, the hypothesized longitudinal relations were not supported. The longitudinal relations between shyness and later

peer acceptance, and peer acceptance and later academic achievement, were significant only when stability and the covariates were not controlled. In addition, the longitudinal relation between shyness and later academic achievement was not significant.

The second purpose of the study was to examine potential concurrent and longitudinal indirect processes linking shyness and academic achievement through peer acceptance. Again, consistent with the hypotheses, the concurrent relations between shyness and academic achievement were fully explained through their associations with peer acceptance, at both times. However, the hypothesized longitudinal indirect processes were only partially supported. Specifically, the longitudinal relation between shyness and academic achievement was not explained by their associations with peer acceptance alone but also relied on the stability of either shyness, peer acceptance, or academic achievement.

Shyness and Peer Acceptance

As hypothesized, teacher-rated shyness was negatively associated with concurrent peer acceptance at both time points in zero-order correlations and the SEM model. There also was a negative longitudinal relation between shyness and later peer acceptance in the zero-order correlations. However, the relation was no longer significant after controlling for previous peer acceptance and shyness at the later time point.

The concurrent relations are consistent with the literature suggesting that shy children in Western culture tend to be less accepted and have fewer friends and more peer difficulties (e.g., rejection and victimization) than nonshy children (e.g., Ladd et al., 2011), and that shy children can have social problems during the early school years (Eggum-Wilkens et al., 2014; Gazelle & Ladd, 2003). Longitudinal relations between shyness or anxious solitude and peer difficulties, such as low peer acceptance, have occasionally been found (e.g., Eggum-Wilkens et al., 2014; Gazelle, 2006), but the studies we reviewed failed to account for previous peer acceptance or for the concurrent relation between shyness and peer acceptance at the later time point when examining the longitudinal associations. Our pattern of relations suggests that the longitudinal relation between shyness and peer acceptance may have been driven by the previous concurrent association and the stability of peer acceptance. Thus, although there seem to be robust concurrent associations between shyness and peer acceptance, our findings suggest that shyness may not predict change in peer acceptance across school years.

Peer Acceptance and Academic Achievement

Consistent with our hypothesis, teacher-rated peer acceptance was positively associated with concurrent academic achievement at both times in zero-order correlations and SEM. In addition, there was a longitudinal association between peer acceptance and academic achievement in the zero-order correlations, but this association was no longer significant when controlling for earlier academic achievement and other study variables at the later time point.

Concurrent results suggested that children who were perceived by teachers as accepted by their peers were also rated by teachers as high academic achievers and were consistent with literature demonstrating associations between positive peer interactions and academic performance throughout childhood (e.g., Austin & Draper, 1984). Direction of effect for the relations within the school year cannot be established, but children who are accepted might be more motivated to participate and engage in school (e.g., Eggum-Wilkens et al., 2014), which leads to better academic outcomes. Similar to the association between shyness and peer acceptance, the connection between children's social and academic lives seems to be early appearing and robust, but there was no evidence that peer acceptance was associated with *change* in academic achievement across school years.

Shyness and Academic Achievement

Concurrent relations between shyness and academic achievement were consistent with hypotheses. Specifically, children's shyness was associated with lower ratings of concurrent academic achievement at both time points in zero-order correlations and SEM, and SEM suggested the concurrent association was fully explained by their associations with peer acceptance at both time points.

In previous research, a negative association between shyness and academic performance has been found in older children (Dobbs et al., 2006; Green et al., 1980; Hughes & Coplan, 2010). The concurrent associations in the present study lend credence to the idea that shy children may be at risk for not only socioemotional problems but also concurrent academic difficulties in the early school years (see Evans, 2010). Concurrent indirect effects suggest that the lack of positive peer relationships may be a mechanism through which shyness relates to poor academic performance within a given school year (Henderson & Fox, 1998). As has been found repeatedly, shy children are prone to receive negative treatment from peers, such as rejection and exclusion, and tend to withdraw from peer activities in the

classroom (e.g., Coplan et al., 2004; Gazelle & Ladd, 2003). The lack of peer-related instrumental resources, such as peer support and assistance, may inhibit shy children's learning process. Furthermore, the emotional distress that shy children experience from failures with peers (e.g., Buhs et al., 2006) may also contribute to their poor academic performance. In other studies, peer acceptance has been found to mediate the association between shyness and later school liking, as well as between shyness and later cooperative participation in the classroom (Eggum-Wilkens et al., 2014). Taken together, peer acceptance may be an important mechanism accounting for concurrent relations between shyness and multiple aspects of the classroom experience. It is important to note that we believe the direction of effect specified in our model is the most likely of the possibilities, given relevant theory, but the direction of the concurrent indirect effects (i.e., shyness to academic achievement via peer acceptance) cannot be determined because the alternative indirect models (e.g., shyness to peer acceptance via academic achievement) are statistically equivalent (Cole & Maxwell, 2003).

Longitudinal relations between shyness and academic achievement were not consistent with hypotheses. There was no significant direct relation between shyness and later academic achievement either in zero-order correlations or in SEM. Thus, shyness did not directly predict later academic achievement or change in academic achievement across time. The literature has not been consistent in terms of existence of a longitudinal association between shyness and academic achievement. For example, similar to our findings, Walker and Henderson (2012) reported that mother-reported and caregiver-reported shyness at preschool were not significantly related to teacher-rated academic skills in kindergarten or first grade. Thus, shyness might not directly predict later academic achievement in the early school years.

However, we found an indirect longitudinal link between shyness and later academic achievement through peer acceptance and the continuity of the study variables. Specifically, shyness did not relate to later lower academic achievement through peer acceptance alone. However, through peer acceptance and the cross-time stability paths of shyness, peer acceptance, and academic achievement, shyness was indirectly related to lower academic achievement 1 year later. It is interesting that shyness did not directly predict later poor academic achievement, but the early social and academic difficulties continued and indirectly linked shyness to later poor academic achievement. For example, shy children were likely to encounter low peer acceptance at age 6, and low peer acceptance continued into the next year and was related to poor academic achievement at age 7. Given the

early emergence of negative social and academic correlates of shyness, and the moderate cross-time stability of peer acceptance and academic achievement, efforts to improve shy children's school adjustment may be needed to occur early in the school years.

Sex as a Moderator

Sex differences in the relations were examined in an exploratory manner, and significant differences were obtained for several relations. However, sex differences in the relations were not consistent within the study or with previous studies. For example, in the present study, shy girls were at a greater risk for lower peer acceptance than were shy boys for the longitudinal but not concurrent relations (in fact, shy boys were at greater risk than were girls for lower acceptance within T2). The literature has not been entirely consistent, with some research suggesting that shy boys are at a greater risk for socioemotional problems (Doey et al., 2014). Given our small sample size, the results should be interpreted with caution, and additional research with larger samples is needed to clarify the sex differences in these associations.

Strengths, Limitations, and Future Directions

To our knowledge, this is the first study to examine the indirect processes linking shyness to concurrent and later academic achievement via peer acceptance. Our findings contribute to the literature by supporting that, in addition to interpersonal problems, shy children may encounter academic difficulties. Moreover, the link between shyness and low academic achievement was mediated by their associations with low peer acceptance (although the longitudinal mediation relied on the cross-time continuity of the study variables). Potential mechanisms have been examined only recently, and results have suggested that social problem-solving competence (Walker & Henderson, 2012) and classroom participation (Hughes & Coplan, 2010) may mediate the association between shyness and academic achievement (but results should be replicated with longitudinal designs in which stability is controlled). Our findings add to the literature and suggest a potential reason that shy children may have academic difficulties.

Another contribution of the present study is that we found shyness to be associated with low peer acceptance and low academic achievement starting from the early school years. The negative social and academic correlates of shyness have been demonstrated, but the timing of onset for these negative outcomes has been debated (e.g., Coplan et al., 2004; Younger

& Boyko, 1987). Our results suggest that shy children start to encounter social and academic problems during the first years of school. Some researchers have suggested that the negative association between shyness and academic achievement may even increase throughout the elementary-school years because characteristics associated with overcontrol (e.g., lack of assertion and lack of self-reliance) may damage self-confidence, including academic self-confidence (Asendorpf & van Aken, 1999). Thus, intervention programs may need to start early to protect shy children from continuing, or exacerbating, adjustment difficulties.

Another strength of the study is that we used longitudinal panel data and, when estimating the longitudinal relations (e.g., T1 shyness with T2 academic achievement), we controlled for prior levels of the outcomes (e.g., T1 academic achievement) and concurrent predictors (e.g., T2 shyness and T2 peer acceptance), which is a stronger test than typically has been used in past research. We observed robust concurrent associations among the variables at both time points but did not find any direct longitudinal associations once controlling for the stabilities. Shyness might not predict later peer acceptance or academic achievement over and above the previous levels in the early school years. Also, shyness might predict change in peer acceptance or academic achievement over time, but the measurement intervals (1 year apart) and frequency (only two waves) were not optimally constructed to capture the true dynamics of the relations in this study (Hertzog & Nesselroade, 2003).

Despite the contributions, our study is not without limitations. In addition to limitations already mentioned, the study variables were all reported by teachers, although, importantly, they were different teachers across years. Teachers may have biased perspectives of shy or quiet children's peer relationships (Phillipsen et al., 1999) and academic skills and performance (Coplan, Hughes, Bosacki, & Rose-Krasnor, 2011). For example, shyness sometimes has been negatively associated with teacher-rated academic performance but not standardized test scores (Hughes & Coplan, 2010). Nonetheless, the fact that teachers' ratings of all constructs were related across time (i.e., across reporters) supports the accuracy of teachers' reports, whereas the cross-time zero-order correlations in the predicted directions support the validity of teachers' reports. Also, peer acceptance would ideally be assessed by peers, but our research design (participants were in many different schools) made such an approach infeasible. To make stronger conclusions, investigators might incorporate objective measures of academic achievement and multisource measures of shyness and peer acceptance in future research.

Furthermore, we may not have enough power to detect the effects that are weak (but still theoretically important), such as the longitudinal relation between shyness and academic achievement. Our sample size also limited our power and ability to detect potential sex differences in the relations and in the indirect processes. Finally, it would be ideal to have at least three waves of data to examine the longitudinal mediation.

In summary, in the present study, we found that shyness, peer acceptance, and academic achievement were concurrently related during the early school years. Although shyness did not relate directly to later academic achievement, there was evidence of indirect effects from shyness to later academic achievement through peer acceptance and the continuity of early social and academic difficulties. Overall, the social and scholastic difficulties that shy children encounter were mostly related to their current, as opposed to previous, shy behavioral style.

References

- Arbeau, K. A., Coplan, R. J., & Weeks, M. (2010). Shyness, teacher-child relationships, and socio-emotional adjustment in Grade 1. *International Journal of Behavioral Development, 34*(3), 259–269. doi:10.1177/0165025409350959
- Asendorpf, J. B. (1990). Beyond social withdrawal: Shyness, unsociability, and peer avoidance. *Human Development, 33*(4–5), 250–259. doi:10.1159/000276522
- Asendorpf, J. B., & Meier, G. H. (1993). Personality effects on children's speech in everyday life: Sociability-mediated exposure and shyness-mediated reactivity to social situations. *Journal of Personality and Social Psychology, 64*(6), 1072–1083. doi:10.1037/0022-3514.64.6.1072
- Asendorpf, J. B., & van Aken, M. A. G. (1999). Resilient, overcontrolled, and undercontrolled personality prototypes in childhood: Replicability, predictive power, and the trait-type issue. *Journal of Personality and Social Psychology, 77*(4), 815–832. doi:10.1037/0022-3514.77.4.815
- Austin, A. M. B., & Draper, D. C. (1984). The relationship among peer acceptance, social impact, and academic achievement in middle childhood. *American Educational Research Journal, 21*(3), 597–604. doi:10.2307/1162918
- Buhs, E. S., & Ladd, G. W. (2001). Peer rejection as an antecedent of young children's school adjustment: An examination of mediating processes. *Developmental Psychology, 37*(4), 550–560. doi:10.1037/0012-1649.37.4.550
- Buhs, E. S., Ladd, G. W., & Herald, S. L. (2006). Peer exclusion and victimization: Processes that mediate the relation between peer group rejection and children's classroom engagement and achievement. *Journal of Educational Psychology, 98*(1), 1–13. doi:10.1037/0022-0663.98.1.1

- Buhs, E. S., Rudasill, K. M., Kalutskaya, I. N., & Griese, E. R. (2015). Shyness and engagement: Contributions of peer rejection and teacher sensitivity. *Early Childhood Research Quarterly, 30*, 12–19. doi:10.1016/j.ecresq.2014.07.010
- Bukowski, W. M., Sippola, L., Hoza, B., & Newcomb, A. F. (2000). Pages from a sociometric notebook: An analysis of nomination and rating scale measures of acceptance, rejection, and social preference. *New Directions for Child and Adolescent Development, 2000*(88), 11–26. doi:10.1002/cd.23220008804
- Chen, X., Zappulla, C., Lo Coco, A., Schneider, B., Kaspar, V., De Oliveira, A., & . . . DeSouza, A. (2004). Self-perceptions of competence in Brazilian, Canadian, Chinese and Italian children: Relations with social and school adjustment. *International Journal of Behavioral Development, 28*(2), 129–138. doi:10.1080/01650250344000334
- Cole, D. A., & Maxwell, S. E. (2003). Testing mediation models with longitudinal data: Questions and tips in the use of structural equation modeling. *Journal of Abnormal Psychology, 112*(4), 558–577. doi:10.1037/0021-843X.112.4.558
- Coplan, R. J., & Arbeau, K. A. (2008). The stresses of a “brave new world”: Shyness and school adjustment in kindergarten. *Journal of Research in Childhood Education, 22*(4), 377–389. doi:10.1080/02568540809594634
- Coplan, R. J., & Armer, M. (2005). Talking yourself out of being shy: Shyness, expressive vocabulary, and socioemotional adjustment in preschool. *Merrill-Palmer Quarterly, 51*(1), 20–41. doi:10.1353/mpq.2005.0004
- Coplan, R. J., Girardi, A., Findlay, L. C., & Frohlick, S. L. (2007). Understanding solitude: Young children’s attitudes and responses toward hypothetical socially withdrawn peers. *Social Development, 16*(3), 390–409. doi:10.1111/j.1467-9507.2007.00390.x
- Coplan, R. J., Hughes, K., Bosacki, S., & Rose-Kransnor, L. (2011). Is silence golden? Elementary school teachers’ strategies and beliefs regarding hypothetical shy/quiet and exuberant/talkative children. *Journal of Educational Psychology, 103*(4), 939–951. doi:10.1037/a0024551
- Coplan, R. J., Prakash, K., O’Neil, K., & Armer, M. (2004). Do you “want” to play? Distinguishing between conflicted shyness and social disinterest in early childhood. *Developmental Psychology, 40*(2), 244–258. doi:10.1037/0012-1649.40.2.244
- Crozier, W., & Hostettler, K. (2003). The influence of shyness on children’s test performance. *British Journal of Educational Psychology, 73*(3), 317–328. doi:10.1348/000709903322275858
- Curran, P. J., West, S. G., & Finch, J. F. (1996). The robustness of test statistics to nonnormality and specification error in confirmatory factor analysis. *Psychological Methods, 1*(1), 16–29. doi:10.1037/1082-989X.1.1.16
- Dobbs, J., Doctoroff, G. L., Fisher, P. H., & Arnold, D. H. (2006). The association between preschool children’s socio-emotional functioning and their

- mathematical skills. *Applied Developmental Psychology*, 27(2), 97–108. doi:10.1016/j.appdev.2005.12.008
- Doey, L., Coplan, R. J., & Kingsbury, M. (2014). Bashful boys and coy girls: A review of gender differences in childhood shyness. *Sex Roles*, 70(7–8), 255–266. doi:10.1007/s11199-013-0317-9
- Duncan, G. J., Dowsett, C. J., Claessens, A., Magnuson, K., Huston, A. C., Klebanov, P., . . . Duckworth, K. (2007). School readiness and later achievement. *Developmental Psychology*, 43(6), 1428–1446. doi:10.1037/0012-1649.43.6.1428
- Eggum-Wilkens, N. D., Valiente, C., Swanson, J., & Lemery-Chalfant, K. (2014). Children's shyness, popularity, cooperative participation, and internalizing problems in the early school years. *Early Childhood Research Quarterly*, 29(1), 85–94. doi:10.1016/j.ecresq.2013.10.002
- Eisenberg, N., Fabes, R. A., Guthrie, I. K., & Reiser, M. (2000). Dispositional emotionality and regulation: Their role in predicting quality of social functioning. *Journal of Personality and Social Psychology*, 78(1), 136–157. doi:10.1037/0022-3514.78.1.136
- Eisenberg, N., Sadovsky, A., & Spinrad, T. L. (2005). Associations of emotion-related regulation with language skills, emotion knowledge, and academic outcomes. *New Directions for Child and Adolescent Development*, 109, 109–118. doi:10.1002/cd.143
- Eisenberg, N., Shepard, S. A., Fabes, R. A., Murphy, B. C., & Guthrie, I. K. (1998). Shyness and children's emotionality, regulation, and coping: Contemporaneous, longitudinal, and across-context relations. *Child Development*, 69(3), 767–790. doi:10.1111/j.1467-8624.1998.tb06242.x
- Evans, M. A. (2010). Language performance, academic performance and signs of shyness: A comprehensive review. In K. H. Rubin & R. Coplan (Eds.), *The development of shyness and social withdrawal* (pp. 179–212). New York: Guilford Press.
- Flook, L., Repetti, R. L., & Ullman, J. B. (2005). Classroom social experiences as predictors of academic performance. *Developmental Psychology*, 41(2), 319–327. doi:10.1037/0012-1649.41.2.319
- Gazelle, H. (2006). Class climate moderates peer relations and emotional adjustment in children with an early history of anxious solitude: A child × environment model. *Developmental Psychology*, 42(6), 1179–1192. doi:10.1037/0012-1649.42.6.1179
- Gazelle, H., & Ladd, G. W. (2003). Anxious solitude and peer exclusion: A diathesis-stress model of internalizing trajectories in childhood. *Child Development*, 74(1), 257–278. doi:10.1111/1467-8624.00534
- Graham, J. E., Updegraff, K. A., Tomascik, C. A., & McHale, S. M. (1997). Someone who cares: Evaluation of school advisor programs in two

- community settings. *Applied Developmental Science*, *1*(1), 28–42. doi:10.1207/s1532480xads0101_4
- Green, K. D., Forehand, R., Beck, S. J., & Vosk, B. (1980). An assessment of the relationship among measures of children's social competence and children's academic achievement. *Child Development*, *51*(4), 1149–1156. doi:10.2307/1129556
- Harter, S. (1982). The perceived competence scale for children. *Child Development*, *53*(1), 87–97. doi:10.1111/j.1467-8624.1982.tb01295.x
- Henderson, H. A., & Fox, N. A. (1998). Inhibited and uninhibited children: Challenges in school settings. *School Psychology Review*, *27*(4), 492–506.
- Hertzog, C., & Nesselroade, J. R. (2003). Assessing psychological change in adulthood: An overview of methodological issues. *Psychology and Aging*, *18*(4), 639–657. doi:10.1037/0882-7974.18.4.639
- Hughes, K., & Coplan, R. J. (2010). Exploring processes linking shyness and academic achievement in childhood. *School Psychology Quarterly*, *25*(4), 213–222. doi:10.1037/a0022070
- Jiang, X. L., & Cillessen, A. H. (2005). Stability of continuous measures of sociometric status: A meta-analysis. *Developmental Review*, *25*(1), 1–25. doi:10.1016/j.dr.2004.08.008
- Ladd, G. W. (1990). Having friends, keeping friends, making friends, and being liked by peers in the classroom: Predictors of children's early school adjustment? *Child Development*, *61*(4), 1081–1100. doi:10.1111/j.1467-8624.1990.tb02843.x
- Ladd, G. W., Birch, S. H., & Buhs, E. S. (1999). Children's social and scholastic lives in kindergarten: Related spheres of influence? *Child Development*, *70*(6), 1373–1400. doi:10.1111/1467-8624.00101
- Ladd, G. W., & Dinella, L. M. (2009). Continuity and change in early school engagement: Predictive of children's achievement trajectories from first to eighth grade? *Journal of Educational Psychology*, *101*(1), 190–206. doi:10.1037/a0013153
- Ladd, G. W., Herald-Brown, S. L., & Reiser, M. (2008). Does chronic classroom peer rejection predict the development of children's classroom participation during the grade school years? *Child Development*, *79*(4), 1001–1015. doi:10.1111/j.1467-8624.2008.01172.x
- Ladd, G. W., Kochenderfer, B. J., & Coleman, C. C. (1997). Classroom peer acceptance, friendship, and victimization: Distinct relational systems that contribute uniquely to children's school adjustment? *Child Development*, *68*(6), 1181–1197. doi:10.2307/1132300
- Ladd, G. W., Kochenderfer-Ladd, B., Eggum, N. D., Kochel, K. P., & McConnell, E. M. (2011). Characterizing and comparing the friendships of anxious-solitary and unsociable preadolescents. *Child Development*, *82*(5), 1434–1453. doi:10.1111/j.1467-8624.2011.01632.x

- MacKinnon, D. P., Lockwood, C. M., & Williams, J. (2004). Confidence limits for the indirect effect: Distribution of the product and resampling methods. *Multivariate Behavioral Research, 39*(1), 99–128. doi:10.1207/s15327906mbr3901_4
- Normandeau, S., & Guay, F. (1998). Preschool behavior and first grade school achievement: The meditational role of cognitive self-control. *Journal of Educational Psychology, 90*(1), 111–121. doi:10.1037/0022-0663.90.1.111
- O'Neil, R., Welsh, M., Parke, R. D., Wang, S., & Strand, C. (1997). A longitudinal assessment of the academic correlates of early peer acceptance and rejection. *Journal of Clinical Child Psychology, 26*(3), 290–303. doi:10.1207/s15374424jccp2603_8
- Phillipsen, L. C., Bridges, S. K., McLemore, T. G., & Saponaro, L. A. (1999). Perceptions of social behavior and peer acceptance in kindergarten. *Journal of Research in Childhood Education, 14*(1), 68–77. doi:10.1080/02568549909594753
- Pierce, K. M., Hamm, J. V., & Vandell, D. L. (1999). Experiences in after-school programs and children's adjustment in first-grade classrooms. *Child Development, 70*(3), 756–767. doi:10.1111/1467-8624.00054
- Rothbart, M. K. (2000). *The Early Childhood Behavior Questionnaire*. Retrieved January 27, 2002 from University of Oregon, Mary Rothbart's Temperament Laboratory Web site: <http://www.uoregon.edu/~maryroth>
- Rothbart, M. K., Ahadi, S. A., Hershey, K., & Fisher, P. (2001). Investigations of temperament at three to seven years: The Children's Behavior Questionnaire. *Child Development, 72*(5), 1394–1408. doi:10.1111/1467-8624.00355
- Rudasill, K. M., Prokasky, A., Tu, X., Frohn, S., Sirota, K., & Molfese, V. J. (2014). Parent vs. teacher ratings of children's shyness as predictors of language and attention skills. *Learning and Individual Differences, 34*, 57–62. doi:10.1016/j.lindif.2014.05.008
- Sette, S., Baumgartner, E., & Schneider, B. H. (2014). Shyness, child-teacher relationships, and socio-emotional adjustment in a sample of Italian preschool-aged children. *Infant and Child Development, 23*(3), 323–332. doi:10.1002/icd.1859
- Smith Watts, A. K., Patel, D., Corley, R. P., Friedman, N. P., Hewitt, J. K., Robinson, J. L., & Rhee, S. H. (2014). Testing alternative hypotheses regarding the association between behavioral inhibition and language development in toddlerhood. *Child Development, 85*(4), 1569–1585. doi:10.1111/cdev.12219
- Spangler, T., & Gazelle, H. (2009). Anxious solitude, unsociability, and peer exclusion in middle childhood: A multitrait-multimethod matrix. *Social Development, 18*(4), 833–856. doi:10.1111/j.1467-9507.2008.00517.x
- Spere, K., & Evans, M. A. (2009). Shyness as a continuous dimension and emergent literacy in young children: Is there a relation? *Infant and Child Development, 18*(3), 216–237. doi:10.1002/icd.621

- Valiente, C., Eisenberg, N., Haugen, R., Spinrad, T. L., Hofer, C., Liew, J., & Kupfer, A. (2011). Children's effortful control and academic achievement: Mediation through social functioning. *Early Education & Development, 22*(3), 411–433. doi:10.1080/10409289.2010.505259
- Vosk, B., Forehand, R., Parker, J. B., & Rickard, K. (1982). A multimethod comparison of popular and unpopular children. *Developmental Psychology, 18*(4), 571–575. doi:10.1037/0012-1649.18.4.571
- Walker, O. L., & Henderson, H. A. (2012). Temperament and social problem solving competence in preschool: influences on academic skills in early elementary school. *Social Development, 21*(4), 761–779. doi:10.1111/j.1467-9507.2011.00653.x
- Wentzel, K. R. (2009). Peers and academic functioning at school. In K. H. Rubin, W. M. Bukowski, & B. Laursen (Eds.), *Handbook of peer interactions, relationships, and groups* (pp. 531–547). New York: Guilford Press.
- Younger, A. J., & Boyko, K. A. (1987). Aggression and withdrawal as social schemas underlying children's peer perceptions. *Child Development, 58*(4), 1094–1100. doi:10.2307/1130549

Peer Clique Participation of Victimized Children: Characteristics and Implications for Victimization Over a School Year

Lynne Zaratany and Paul F. Tremblay *University of Western Ontario*

Wendy E. Ellis *King's University College*

Xinyin Chen *University of Pennsylvania*

Megan Kinal and Lisa Boyko *University of Western Ontario*

This study examined aspects of peer clique participation that mitigated victimization by peers over a school year. Participants were 1,033 children age 8–14 years ($M_{age} = 11.81$; 444 boys and 589 girls), including 128 (66 boys) victimized children. Cliques ($N = 162$) and clique participation were assessed by using the Social Cognitive Map, friendship and behavioral nominations, and observed clique interactions. Almost all victimized children (93%) were clique members. On average, their cliques were more mixed-gender, loosely tied, and peripheral in the peer network, and they were more marginal clique members and treated more negatively during clique interactions than were nonvictims. Variation in clique experience revealed that victimization was mitigated over the school year by greater centrality and friendship within cliques and greater clique aggression, and exacerbated by greater clique victimization and age. These findings suggest that allegiance, affection, and power may deter attacks and motivate cliquemates' defense of victims.

Although estimates vary across countries, approximately 11% of school populations are routinely victimized by their peers at school (Nansel et al., 2004). Targeted by one or more perpetrators, victimized

Lynne Zaratany, Paul Tremblay, Megan Kinal, Lisa Boyko, Department of Psychology; Wendy Ellis, Department of Psychology; and Xinyin Chen, Applied Psychology–Human Development Division, Graduate School of Education.

This research was supported in part by a grant from the Social Sciences and Humanities Research Council of Canada to Wendy Ellis, Xinyin Chen, and Lynne Zaratany.

Address correspondence to Lynne Zaratany, Department of Psychology, University of Western Ontario, Westminster Hall, London, ON, Canada N6A 3K7. Phone: (519) 661-3664. Fax: (519) 850-2554. E-mail: lynnez@uwo.ca.

Merrill-Palmer Quarterly, October 2017, Vol. 63, No. 4, pp. 485–513. doi: 10.13110/merrpalmquar 1982.63.4.0485 Copyright © 2018 by Wayne State University Press, Detroit, MI 48201.

children suffer physical or psychological harassment, ostracism, and other forms of maltreatment, sometimes over a period of several years (Cillessen & Lansu, 2015). The stress induced by victimization has been associated with a wide range of psychological, social, health, and financial problems that may extend well into early adulthood (Wolke, Copeland, Angold, & Costello, 2013). Massive efforts have been made to eliminate victimization from school environments, but, despite some improvement, the problem remains tenacious (Yeager, Fong, Lee, & Espelage, 2015).

With increased understanding of the adverse consequences of victimization, researchers have searched for peer-relationship factors that protect children from victimization at school. Although even high-status or popular children sometimes are victimized (e.g., Faris & Felmlee, 2014), findings generally paint a bleak portrait of the peer relationships of highly victimized children. These children tend to be disliked by many classmates (e.g., Hodges & Perry, 1999) and have fewer friends (Scholte et al., 2009), lower-quality friendships (e.g., Kendrick, Jutengren, & Stattin, 2012), friends who are also victimized (e.g., Sentse, Dijkstra, Salmivalli, & Cillessen, 2013), and few defenders (e.g., Salmivalli, Lappalainen, & Lagerspetz, 1998). Victimization risk declines when children have many friends (e.g., Fox & Boulton, 2006), high-quality friendships (Malcolm, Jensen-Campbell, Rex-Lear, & Waldrip, 2006), and friends who are supportive (e.g., Kendrick et al., 2012), protective (Hodges, Boivin, Vitaro, & Bukowski, 1999), aggressive (Hodges, Malone, & Perry, 1997; Pellegrini, Bartini, & Brooks, 1999), and well liked by peers (Fox & Boulton, 2006). Thus, children may be protected from victimization if they are able to form and maintain friendships.

Although research on victimized children's peer acceptance and friendships has flourished, relatively little is known about their participation in *cliques*—that is, informal groups of three or more peers who interact frequently (Brown & Dietz, 2009). Cliques are not simply clusters of friends, but rather individuals who routinely gather to engage in shared activities (Kindermann & Skinner, 2012). Social life largely occurs in a clique context by late childhood (Crockett, Losoff, & Petersen, 1984), and cliques serve an important socializing function, instilling values, setting and regulating behavioral expectations (Hartup, 2009), and providing a conduit to romantic relationships (Brown, 1990). Because friendship is not a requirement of clique membership, even friendless (Gest, Graham-Bermann, & Hartup, 2001; Kindermann, 2007) and disliked children (Bagwell, Coie, Terry, & Lochman, 2000) may be clique members. Accordingly, the purpose of the present study was to characterize the clique experiences of

victimized children and identify aspects of their clique participation that protected them from victimization over a school year.

Characteristics of Victimized Children's Interaction-Based Cliques

To date, only a few studies have examined victimized children's interaction-based cliques, and these studies primarily assessed cliquemates' involvement in bullying participant roles (Salmivalli, Lagerspetz, Björkqvist, Österman, & Kaukiainen, 1996). Results suggest that victimized children may increasingly associate with bullying-involved peers with age. For example, Perren and Alsaker (2006) found 5- to 7-year-old nonaggressive victims mostly in cliques with uninvolved peers, whereas Farmer et al. (2010) reported that 7- to 8-year-old nonaggressive female (but not male) victims associated with other victimized children at a rate greater than chance. Early adolescent female and male victims (age 12–14 years) associated primarily with other victims and defenders, bully assistants and reinforcers (male victims only; Salmivalli, Huttunen, & Lagerspetz, 1997), or aggressors (especially male victims; Estell, Farmer, & Cairns, 2007). Aggressive victims (or bully-victims), the small proportion of victimized children who also aggress against peers (estimates range 10%–25% of all victimized children [Solberg, Olweus, & Endresen, 2007] to 4%–8% of all children [Schwartz, Proctor, & Chien, 2001]), were precocious in their association with other bullying-involved peers, beginning as early as kindergarten (Perren & Alsaker, 2006). This initial wave of research on victimized children's cliques represents an important first step, but replication of the findings is needed given the limited number of studies, variations in age, inclusion of an unknown number of dyads among bona fide cliques, and disparities in selection criteria used to identify victimized children. Further, the implications of membership in cliques that are highly populated by aggressive or victimized children for victimized children's continuing maltreatment need to be assessed (Hodges et al., 1997; Pellegrini et al., 1999).

Information about potentially protective characteristics of victimized children's cliques generally is lacking. For example, structural features such as size, centrality (prominence) within the larger peer network, stability, and tight-knittedness (i.e., friendship density) (Bukowski, Castellanos, Vitaro, & Brendgen, 2015; Gest, Davidson, Rulison, Moody, & Welsh, 2007) may carry information about the clique's power and commitment to protect members from maltreatment by others. Outsiders may be more hesitant to harass members of large, central, stable, and/or affectively committed cliques, whose cliquemates are willing and capable of organizing

effective defense and reprisals, than are members of smaller, peripheral, loosely tied, and/or unstable cliques whose cliquemates pose little threat. Research on friendship and peer acceptance suggests that victimized children's cliques most likely consist of the latter type of clique—a few loosely connected children (Boivin & Hymel, 1997; Boulton, 1999) who are at the fringes of social life at school. However, victimized children who are members of cliques with more diverse and potentially protective characteristics may find sanctuary from further peer maltreatment.

Characteristics of Victimized Children's Within-Clique Experience

The potential safety afforded by powerful and committed cliques may be insufficient to stave off victimization unless victimized children's idiosyncratic experiences *within* their cliques also are considered (Brown & Dietz, 2009). Evidence of maltreatment within cliques (e.g., Adler & Adler, 1998) and friendships (Crick & Nelson, 2002; Zimmer-Gembeck, Pronk, Goodwin, Mastro, & Crick, 2013) leaves open the possibility that victimized children's common associates are a source of their victimization. In such cases, clique membership may exacerbate rather than alleviate victimized children's social difficulties. Prior friendship research suggests that victimization within the clique may be deterred by close friendship ties with cliquemates. Beyond dyadic friendships, however, clique social organization potentiates unique relationship dynamics (Hartup, 2009) that also may influence victimization risk. For example, whereas friendships typically are egalitarian (Newcomb & Bagwell, 1995), clique social organization may be hierarchical. Individuals who are more central to the clique's existence and identity may be less prone to victimization by cliquemates than are those with more peripheral status (Hogg, 2005) because of the respect and allegiance they engender.

The Present Study and Hypotheses

The present study had three major goals. First, in view of limited research on victimized children's clique participation, we compared the clique experiences of highly victimized and nonvictimized 8- to 14-year-olds on two potentially protective aspects of clique association: power or prominence and closeness. At the clique level, we assessed clique characteristics that might discourage attacks from outsiders, including clique size, clique centrality (prominence) in the larger peer network, aggression of clique members, friendship density within the clique, and stability of clique membership over a school year. We also examined victimization of clique

members as a risk factor. At the individual level, we assessed indices of children's clique membership that might protect against maltreatment by cliquemates and motivate defending behavior, including their centrality (prominence) within the clique and the proportion of reciprocated friends they had within the clique. Our second goal was to identify which, if any, characteristics of cliques and individual clique membership mitigated victimization over an academic year.

Our final goal was to observe a subset of victimized children's interactions with cliquemates for direct evidence of their treatment by frequent associates. Although exemplary observational work has been conducted on victimization episodes at schools (e.g., Boulton, 1999; Hawkins, Pepler, & Craig, 2001; Pellegrini & Long, 2002), observational evidence of victimized children's behavioral experiences within cliques is lacking. To elicit a wide range of positive and negative behavior in a context commonly faced by groups, we observed clique members in a brief play session involving a single remote-control helicopter. Limited-resource tasks such as sharing a single special toy often have been used to evoke cooperation, competition, control, and dominance among children (e.g., Charlesworth & Dzur, 1987; French, Chen, Chung, Li, Chen, & Li, 2011) and consequently are good contexts for observing group dynamics under conditions of mild stress. Our observational data provide a first glimpse at the quality of victimized children's interactions within their peer cliques in this challenging social situation.

Based on past research, we expected to find victimized children in an impoverished social landscape, clustered together, and possibly with aggressive children (Estell et al., 2007), in cliques that were smaller, more peripheral in the larger peer network, less stable, and less interpersonally close (Boivin & Hymel, 1997) than were cliques of nonvictimized children. We also anticipated that victimized children would be low in prominence and affection within their cliques, as reflected by peripheral status (Estell et al., 2007) and a lower proportion of friendships with cliquemates. In the competitive limited-resource activity, we expected that victimized children would be treated more negatively (e.g., criticized and rebuffed) by cliquemates than nonvictimized children. In view of findings that behavioral and adjustment problems are more extreme in aggressive than nonaggressive victimized children (e.g., Wolke et al., 2013), we considered child aggression in all analyses to determine whether negative clique experiences were more evident for aggressive victims. To the extent that negative attributes of peer clique experience were not ubiquitous among victimized children, we anticipated that protection from victimization would be greater when cliques were more powerful (aggressive, larger, and central) and closer

(higher friendship density), and when victimized children were more central members and had a larger proportion of friendships.

Gender differences favoring boys have been observed in various aspects of peer interaction related to our study, including aggressive behavior, as well as the size, friendship density, and hierarchical organization of the peer group (for a review, see Rose & Rudolph, 2006), although findings on group structure are sometimes inconsistent (Gest et al., 2007), and vary from early childhood to adolescence (Rose & Rudolph, 2006). Consequently, we routinely checked for gender and grade differences in victimized children's clique experiences. We also tested for gender- and grade-related variations in the clique factors that protected against victimization, although we had no basis for anticipating differences.

Method

Participants

Participants were 1,033 children (444 boys and 589 girls) in Grades 4–8, inclusive, from eight elementary schools (six public and two publicly funded Catholic) in Southwestern Ontario. Three schools were in small towns or cities, and five were from a midsized city. The children's range in age was 7.94–14.66 in the fall ($M_{\text{age}} = 11.81$, $SD = 1.53$). The majority (66.6%) of children were European Canadian, and the remaining children were Asian Canadian (8.5%) and Hispanic Canadian (3.4%), with other ethnicities represented at less than 2% each. The majority of children lived with their biological mother and father (74%), mother only (10.6%), or mother and stepfather (8.4%). Based on Statistics Canada (2010) census data for the school catchment areas, the socioeconomic status of the sample ranged from lower to upper-middle class, with the majority in the lower-middle range. All children from the 52 classes in Grades 4–8 in the eight schools were invited to participate, and 76.1% of children received parental consent and assented (within schools, range 35%–100% per classroom; 50%–95% per grade). Participation rates were lower than 60% in only seven classes.

Clique Identification

Children's cliques were identified by using the Social Cognitive Map (SCM; Cairns, Cairns, Neckerman, Gest, & Garipey, 1988), a method of network assessment that relies on public observations of social groupings.

Children were asked to provide the names of their own group (clique) members and members of other groups in their school by using free recall (i.e., kids who hang out together a lot at school). For each grade within a school, composite social maps were generated based on the patterns of conominations of children into cliques by using SCM 4.0 (Cairns, Leung, Buchanan, & Cairns, 1995). The SCM algorithm groups children based on the similarities in their profiles of nominations (i.e., a structural equivalence approach) and has the advantage of identifying connections among participants who themselves do not give information about their cliques, as long as these are well known by others. When participation rates are less than 100%, and socially marginalized children are of focal interest, reports from peers on the entire network provide a more complete representation of individual children's social integration (by identifying all relationship partners) and their centrality within the network, than do network identification procedures that rely exclusively on self-reports.

Recently, J. W. Neal and Z. P. Neal (2013; Z. P. Neal & J. W. Neal, 2013) questioned use of the SCM algorithm for identifying interaction-based groups because two children who are never named together, but who are each named separately with a similar set of peers, could theoretically be placed in the same group by SCM. Until further work establishes the magnitude of this concern (Farmer & Xie, 2013), the usefulness of the SCM algorithm for identifying children who hang around together is supported by evidence that (a) children in Grades 4–7 interact four times more frequently with groupmates identified with the SCM than with other students in their classrooms (Cairns, Perrin, & Cairns, 1985; Gest, Farmer, Cairns, & Xie, 2003); (b) when applied to data gathered with the SCM method, a profile-similarity approach very similar to the one used in SCM 4.0 yields groups that are similar to those produced by more contemporary group-detection algorithms (Gest, Moody & Rulison, 2007); and (c) as part of the current observational protocol, when asked as a group to identify defining characteristics of their group (not reported herein), no child indicated that he or she was not a member of the group.

Because we planned to observe clique interactions, children who were members of multiple cliques ($n = 230$) were assigned to the one clique in which they had a minimum correlation of $r = .50$ in terms of similarity of clique comembership with at least half of the members (Cairns et al., 1988). To facilitate filming of cliques for our behavioral analysis, cliques containing nine or more children were split into two (17 cliques) or three (two cliques) subcliques ranging in size from three to eight members. When forming subcliques, we kept together clique members whose SCM scores were most highly correlated. We retained one nine-member clique

because the correlation matrix did not point to an obvious division of clique members.

Victimization and Aggression

A modified Revised Class Play (Masten, Morison, & Pellegrini, 1985) was used to obtain scores for victimization and aggression. This method identifies publicly known victimized and aggressive children by public consensus (i.e., classmate nominations). From lists of participating classmates, children were asked to nominate up to three peers who best fit each behavioral description. Victimization scores were formed from two highly correlated ($r = .84$) items (Crick & Bigbee, 1998), one relational (“gets left out on purpose during an activity or game”) and one overt (“is bullied and picked on by other kids”). Scores on two relational aggression items (“tries to keep certain people from being in his/her group during activities or playtime” and “says mean things or spreads rumors about other kids when he/she is mad at them;” Crick & Grotpeter, 1995) and three overt aggression items (“gets into a lot of fights,” “picks on others,” and “teases other people too much”) were combined to form a single aggression score based on a high correlation between subscale scores ($r = .69$). Reliability (alpha) of victimization scores was .81 (fall) and .87 (spring), and reliability of fall aggression was .90.

The number of nominations each child received for each item was summed and standardized within classrooms; item scores within each construct were then averaged and restandardized. Aggression was positively correlated with victimization for children in Grade 4 ($r = .18, p < .05$) and Grade 5 ($r = .20, p < .01$), but uncorrelated with victimization for children in Grades 6–8 ($r_s = -.08$ to $.04, ns$). A total of 128 children (12.30% of total sample) scored 1 *SD* or more above their class mean on victimization, including 66 boys and 62 girls. Using the same cutoff for aggression, there were 107 nonaggressive (56 boys; 17–26 per grade) and 21 aggressive victims (16.41% of victimized children; 13 boys and 8 girls; 5–7 in each of Grades 4–6 and 3 in Grades 7 and 8).

Clique Characteristics and Children's Within-Clique Integration

Clique and individual centrality. SCM assigned centrality scores to cliques, and to individuals within cliques, based on the frequency with which members were nominated to cliques (Gest et al., 2001). The centrality index (CI) of each clique is based on the average number of nominations received by the two cliquemates who received the most nominations (Cairns et al., 1995). Nuclear cliques (high centrality) had a $CI \geq (0.7 \times CI_h)$,

where CI_h was the highest ranking clique in the network. Peripheral (low centrality) cliques had CIs $\leq (0.3 \times CI_h)$, and secondary cliques fell between these two extremes. Cairns et al. (1995) found no difference in stability (retest reliability) of central, secondary, and peripheral cliques over a 3-week period. Clique members' within-clique centrality was calculated by using a parallel method, with CI_i (the CI of the members' clique) substituted for CI_h . Previous research has found high levels of consensus among respondents regarding centrality within cliques (Cairns et al., 1985).

Clique friendship density and individual proportion of friends within a clique. Children were asked to name up to 10 best friends at school. For each SCM clique, we divided the number of actual reciprocal friendships (pairs of cliquemates who nominated each other as friends) by the number of possible reciprocal friendships within the clique to obtain a score for clique reciprocal friendship density. For each clique member, we calculated the proportion of reciprocated friendships within the entire clique (n actual/ n possible reciprocal friendships). We separately calculated individual friendship proportion scores for children in the videotaped cliques, including friendship nominations for only clique members who participated in the clique interactions.

Clique stability and stability of individual membership. Clique stability was scored as the proportion of original members who retained clique membership in the spring. Individual stability, which was included as a control variable in longitudinal analyses, was scored in dichotomous (0–1) format as a continuing or noncontinuing clique membership based on the spring SCM assessment.

Observations of Victimized Children's Treatment by Cliquemates

For filming, cliques were escorted to a quiet room in the school (e.g., vacant classroom, gymnasium, library, or lunchroom). Two video cameras were positioned at diagonal corners of a rectangular play space taped to the floor. Sessions were conducted by two of seven young adult research assistants (five women) who used a standard script to deliver task instructions and probes during the 50- to 60-min session. After instructions were given, the researchers moved out of sight but within earshot of the cliques and returned only to answer questions, provide additional instructions, prompt on-task behavior, or fix malfunctioning toys.

The observational session consisted of five activities in invariant order; the fourth activity, reported herein, involved a 5-min play period with a single remote-control helicopter (limited resource). This limited-resource activity was coded by one undergraduate and two graduate students not

involved in data collection by using a revised version of the coding system developed by French et al. (2011). For the present study, several finer-level negative and positive resource control behaviors were aggregated into two scores: one for total negative and one for total positive behavior received by each clique member. Negative behavior included forceful bids for the control (e.g., "Give it to me now!" and grabs the remote from possessor), negative advice (e.g., "Stop it. You'll break it"), refusals to share, and ignoring of bids for control. Positive behavior included nonforceful attempts for the control (e.g., "Can I play now?" and holds out hand for the remote), positive advice (e.g., "Try pressing that button to make it go higher"), unsolicited giving of the remote, and compliance with a bid for the control. Joint observations by pairs of observers for 20% of the clique interactions produced kappas ranging 0.84–1.0 for positive and negative behavior received, excluding errors of omission. Errors of omission caused by sound problems or obscured vision lowered some kappas, so all episodes were coded independently by two observers, and all disagreements were resolved.

Procedure

The study was approved by the University of Western Ontario Research Ethics Review Committee. Data were collected from 390 children attending four schools during the 2008–9 academic year and from the remaining children in the 2009–10 academic year. Participants completed the questionnaires, including several not included in the present study, in 2-h sessions in their classrooms. Fall sessions occurred from mid-October to early December, and spring sessions between late May and early June of the same academic year (a 6- to 7-month interval). Cliques were observed and filmed between the two questionnaire administrations (January to April). All items were read aloud for children in Grades 4 and 5, whereas older children completed the survey at their own pace after receiving general instructions. At least one research assistant was available to answer questions or help with reading throughout the session. At the end of the academic year, children who completed at least one portion of the study received a \$10.00 gift certificate, and participating schools received a \$500.00 honorarium.

Results

The results are organized into three major sections. First, we compare the clique characteristics and within-clique integration of highly victimized and nonvictimized children who participated in cliques. Second, we test for

mitigation of victimization over the school year by clique characteristics and within-clique centrality and friendship. Finally, we examine behavioral treatment of victimized children by cliquemates. Before presenting our primary findings, we describe the cliques identified by the SCM.

Peer Cliques

The SCM identified 999 children (96.71%; 425 boys and 574 girls) in 162 peer cliques ranging 3–17 members ($M = 6.19$ members, $SD = 2.80$). Nonclique members ($n = 34$) were more likely to be younger ($M_{\text{age nonclique}} = 11.10$, $SD = 1.68$ vs. $M_{\text{age clique}} = 11.84$, $SD = 1.52$), $t(1029) = -2.76$, $p = .006$; more victimized ($M_{\text{vic nonclique}} = .38$, $SD = .98$ vs. $M_{\text{vic clique}} = -.01$, $SD = .97$), $t(1031) = 2.33$, $p = .02$; and less aggressive ($M_{\text{aggr nonclique}} = -.28$, $SD = .63$, $M_{\text{aggr clique}} = .01$, $SD = .82$), $t(1031) = -2.06$, $p = .039$. The number of male and female participants, and all-male, all-female, and mixed-gender cliques in each grade are listed in the top of Table 1.

Table 1. Number of boys, girls, and male, female, and mixed-gender SCM and video cliques by grade

SCM cliques				Clique gender			
Grade	Boys	Girls	All	Male	Female	Mixed	All
4	84	104	188	12	13	7	32
5	97	115	212	11	12	12	35
6	80	139	219	10	16	10	36
7	87	106	193	10	12	7	29
8	77	110	187	8	16	6	30
All	425	574	999	51	69	42	162
Video cliques				Clique gender			
Grade	Boys	Girls	All	Male	Female	Mixed	All
4	61	83	144	10	16	6	32
5	69	93	162	11	15	9	35
6	63	109	172	10	19	7	36
7	58	76	134	10	13	5	28
8	34	59	93	5	9	3	17
All	285	420	705	46	72	30	148

Note. SCM = Social Cognitive Map.

Clique Participation of Victimized Children

A total of 119 (93%) of the 128 victimized children were identified as clique members by the SCM. Seven nonaggressive and two aggressive victims were not clique members. Descriptive analyses reported in this section were conducted with and without inclusion of aggressive victimized children, and findings remained unchanged. Therefore, findings related to the whole sample of victimized children are reported.

Of the 162 cliques, 83 (51.23%) identified by the SCM contained one or more victimized children, and 79 cliques contained no victims. Cliques containing one or more victims and cliques containing no victims were evenly distributed across the five grades, $\chi^2(4) = 4.93$, *ns*, but cliques containing victimized children were more likely to be mixed gender than were cliques without victims (32.53% vs. 18.99%) and less likely to be all-female (33.73% vs. 51.90%), $\chi^2(2) = 6.27$, $p = .043$. Given the very few cliques of each gender per grade, children in Grades 4–6 were consolidated into a younger group, and children in Grades 7 and 8 into an older group for the analyses of variance (ANOVAs) reported in the following section *Clique aggression, size, stability, centrality, and friendship density*.

Victim clustering within cliques. Of the 83 cliques containing victimized children, 51 (61.45%) contained a single victimized child, 28 (33.73%) contained two victimized children, and four (4.82%) contained three victimized children. Victimized children formed the majority of clique members in 10 (12.00%) of the cliques containing victims, but no clique consisted entirely of victimized children. Thus, although some victim clustering was evident, victimized children mostly were members of cliques containing a majority of nonvictimized children.

Clique aggression, size, stability, centrality, and friendship density. A series of 2 (Clique type–Victims, No victims) \times 3 (Clique gender) \times 2 (Clique grade) ANOVAs produced no significant effects involving clique type for clique aggression, size, or stability over the school year (see Table 2 for means and standard deviations). However, there was a main effect of clique type for clique centrality, $F(1, 150) = 6.47$, $p = .012$, $d = .43$, and clique friendship density (proportion of reciprocated friendships, arcsine transformed), $F(1, 150) = 12.71$, $p < .001$, $d = .68$. Cliques containing victimized children were less central in the larger peer network and had a lower proportion of reciprocated friendships than did cliques without victims.

All questions pertaining to individual children were addressed by using multilevel modeling (MLM). We used Statistical Package for the Social Sciences (SPSS) mixed models with the maximum likelihood

Table 2. Means and (standard deviations) for clique characteristics

Characteristic	Cliques		
	All	No victims	≥1 Victim
Aggression	0.01 (0.42)	0.00 (0.44)	0.02 (0.40)
Size	6.17 (2.78)	5.86 (2.55)	6.47 (2.97)
Stability	0.71 (0.32)	0.69 (0.35)	0.73 (0.29)
Centrality	1.46 (0.57)	1.34 (0.55)	1.58 (0.56)*
Friendship density	0.58 (0.37)	0.70 (0.40)	0.46 (0.29)***

Note. Clique centrality is coded 1 = central, 2 = secondary, and 3 = peripheral. Friendship density is the proportion of all dyadic ties within a clique that consist of reciprocated friendships.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

estimator to test relations between predictor and outcome variables in MLM. We first tested unconditional models to determine the proportion of variance in the outcome variables attributable to clique differences (i.e., the intraclass correlations [ICCs]), and then tested for the effects of the dichotomized victimization variable (victim vs. nonvictim), which was group-mean centered (Peugh, 2010). The ICCs for within-clique centrality, friendship, and stability of membership were .11, .60, and .28, respectively ($ps < .001$).

Within-clique centrality, friendship, and stability of membership. Victimized children were more peripheral members of their cliques ($\beta = .50$, $SE = .07$, $t = 7.58$, $p < .0001$), had a lower proportion of friends in their cliques ($\beta = -.19$, $SE = .03$, $t = -5.65$, $p < .0001$), and were less-stable clique members ($\beta = -.05$, $SE = .01$, $t = -3.88$, $p < .0001$) than were nonvictimized children. However, victimized children were represented at every centrality rank within cliques, including central ($n = 43$), secondary ($n = 51$), and peripheral ($n = 25$), 72% of victimized children had at least one reciprocated friend in the clique (range 0–6), and the majority (59%) of victimized children retained original clique membership over the school year.

Predicting Spring Victimization From Clique Characteristics and Within-Clique Centrality and Friendship

A total of 95.8% of the original sample completed questionnaires in the spring, including 118 (92.19%) of the original 128 victimized children. Of these children, 74 (62.71%) remained victimized, whereas

44 (37.29%) no longer met the 1 *SD* cutoff for victimization. Missing scores for spring victimization were not imputed because the rate of missing data was very low, and scores were not missing at random in several cases (e.g., standardized spring victimization scores could not be computed for some groups because no child was nominated as a victim in an entire classroom).

We predicted spring victimization from individual scores for children on fall victimization, aggression, stability of membership, centrality, and friendship, and clique scores for victimization, aggression, size, centrality, friendship density, grade, and gender. To obtain the best estimates of the stability of victimization across the year, and more powerful tests of moderation of this stability (i.e., interactions), we used continuous rather than dichotomous scores for victimization and aggression in these MLM analyses.

We grand-mean-centered predictors at levels 1 and 2 to isolate the level-1 and level-2 influences of a given predictor (Enders & Tofighi, 2007). In models for which we tested a cross-level interaction (e.g., individual victimization \times clique aggression), we also included a level-2 interaction term involving the same variables but aggregated at level 2 (e.g., clique victimization \times clique aggression). To identify clique experiences that moderated victimization stability over the school year, we used a model-building approach starting with level-1 predictors, followed by a random slope component for the effect of fall victimization on spring victimization, level-1 interactions, level-2 predictors, level-2 interactions, and cross-level interactions. Level-1 variables and interactions were retained in the final model, but nonsignificant predictors at higher levels were removed.

The ICC for spring victimization was .04, *ns*. As indicated in Table 3, level-1 and cross-level interactions revealed that the stability of victimization over the school year was moderated by individual within-clique centrality and within-clique friendship, and clique victimization, clique aggression, and clique grade. These five interactions are displayed in Figures 1–5. Tests of simple slopes showed that although the relation between fall and spring victimization was significantly positive regardless of other factors—that is, all simple slopes, when using standard errors provided by Preacher, Curran, and Bauer (2006), are significantly different from zero ($p < .001$)—the relation was weaker for children who were central in their peer cliques, had more friends in their cliques, and were members of cliques that were less victimized, more aggressive, and younger (all $ps < .001$). None of these significant interactions was further qualified by gender or grade.

Table 3. Predicting spring victimization from individual and clique characteristics

Predictor variable	β	SE	<i>t</i>
Intercept	-.07	.02	-2.97**
Level 1: Individual predictors			
Individual stability of clique membership	-.03	.05	-0.68
Individual gender	.05	.04	1.29
Individual victimization	.48	.05	10.26***
Individual aggression	.08	.03	2.74**
Individual centrality	.13	.04	3.63***
Individual friendship	-.06	.05	-1.17
Individual Victimization \times Aggression	.03	.03	0.89
Individual Victimization \times Centrality	.12	.04	2.66**
Individual Victimization \times Friendship	-.17	.09	-1.96*
Level 2: Clique predictors			
Clique victimization	.18	.06	3.32**
Clique aggression	-.03	.06	-0.54
Clique grade	.01	.02	0.53
Clique Victimization \times Clique Aggression	.17	.14	1.22
Clique Victimization \times Clique Grade	-.07	.04	-1.67
Level 2: Cross-level predictors			
Individual Victimization \times Group Victimization	.16	.06	2.57*
Individual Victimization \times Group Aggression	-.23	.11	-2.05*
Individual Victimization \times Group Grade	.10	.03	3.57**

Note. Variance of residual components in the final equation were as follows: level-1 residual (.339**), intercept (.003), slope (.087***), and cov.-int. slope (.018).

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Victimized Children's Behavioral Treatment by Cliquemates

Participants in the observational portion of the study consisted of 705 children (420 girls) in 148 cliques or subcliques (80.87% of eligible cliques or subcliques) ranging in size from 3 to 9 members ($M_{\text{size}} = 4.74$, $SD = 1.58$; $M_{\text{age}} = 11.59$, $SD = 1.37$). An average of 92.19% of clique members participated (range 60%–100%). The remaining children and cliques were absent from school on filming days or could not be observed because of

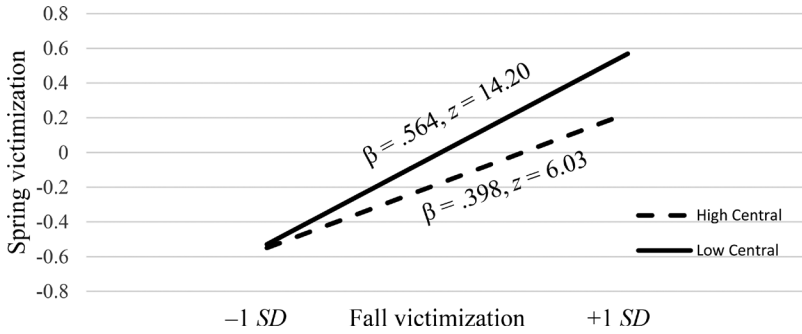


Figure 1. Simple slopes involved in the interaction between individual fall victimization and within-clique centrality in the prediction of spring victimization.

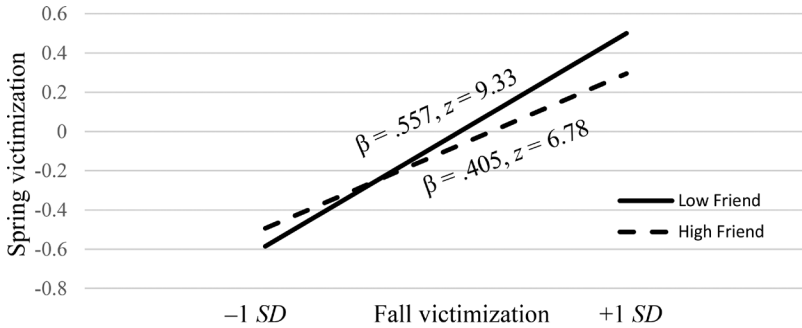


Figure 2. Simple slopes involved in the interaction between individual fall victimization and within-clique friendship in the prediction of spring victimization.

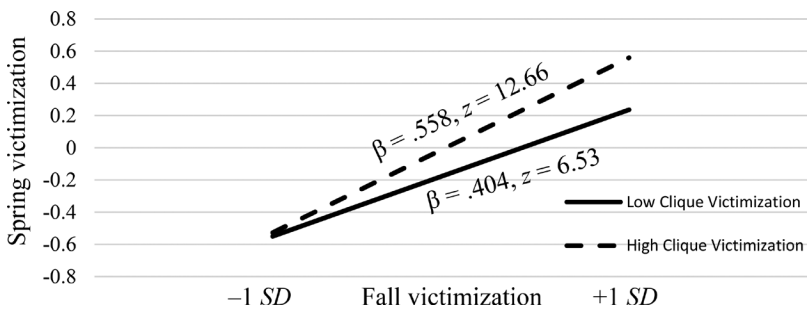


Figure 3. Simple slopes involved in the interaction between fall victimization and clique victimization in the prediction of spring victimization.

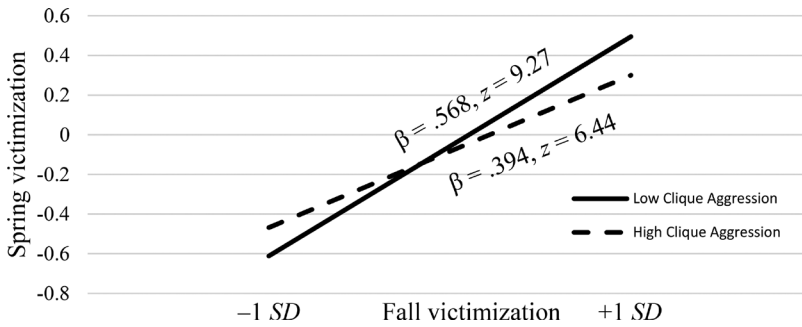


Figure 4. Simple slopes involved in the interaction between fall victimization and clique aggression in the prediction of spring victimization.

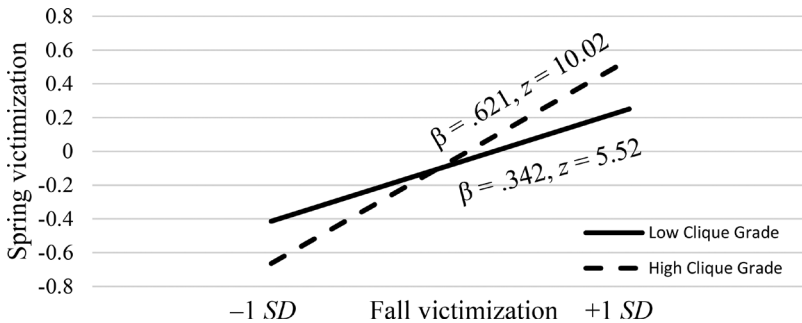


Figure 5. Simple slopes involved in the interaction between fall victimization and clique grade in the prediction of spring victimization.

time constraints imposed by the schools. Gender composition and grades of videotaped cliques are listed in the lower half of Table 1. Comparison of children who did and did not participate in the observational portion of the study revealed that participants were more likely to be girls ($\chi^2 = 5.92$, $p = .015$), and younger, $F(1, 1029) = 16.41$, $p < .001$. Participants also were more likely to be central members (61.1% vs. 52.4%) and less likely to be peripheral members (7.1% vs. 13.0%) of their SCM cliques ($\chi^2 = 11.44$, $p = .003$) than were nonparticipants, and had a marginally greater proportion of reciprocated friends, $M_{\text{participant}} = .49$, $SD = .29$, vs. $M_{\text{nonparticipant}} = .46$, $SD = .31$, $t(984) = -1.85$, $p = .075$, within their cliques. There were no group differences in fall victimization or aggression scores of observed and unobserved children ($t_s < 1.47$, $p_s > .14$). A total of 80 victimized children, including 15 aggressive victims, in 58 cliques were included in the observational data set.

We analyzed negative and positive behavior received by cliquemates in separate MLM analyses. Each analysis contained five level-1 group-mean-centered predictors, including dichotomized scores on fall victimization and aggression, and control variables including within-clique centrality, friendship, and gender. Because the majority of cliques were homogeneous for grade (89.93%) and gender (79.86%), gender at level 1 was included as a control variable only for mixed versus homogeneous gender. Clique gender and grade were included as level-2 grand-mean-centered predictor variables. Level-2 scores for clique gender were created such that 1.00 referred to an all-boy clique, 2.00 referred to an all-girl clique, and scores of 1–2 signified mixed-gender cliques, with higher scores indicating a larger girl population. In separate analyses, we checked for interactions between fall victimization and all other level-1 predictors, including aggression, as well as cross-level interactions between fall victimization and clique grade and gender. Interaction effects were not significant and are not reported.

The mean number of negative and positive behaviors received by the observed cliques were 2.30 and 4.75, respectively (*SDs* = 2.45 and 3.38, respectively). The ICCs for negative and positive behavior received were .44 and .30, respectively (*ps* < .001). MLM findings involving prediction of these two variables for the observed cliques are reported in Table 4. Victimized children received more negative behavior than did nonvictimized children but not less positive behavior. Significant effects emerged

Table 4. Predicting negative and positive behavior received by cliquemates

Predictor variable	Negative behavior received			Positive behavior received		
	β	<i>SE</i>	<i>t</i>	β	<i>SE</i>	<i>t</i>
Intercept	2.34	.15	15.36***	4.76	.18	26.13
Victimization	0.61	.28	2.19*	0.32	.42	0.77
Aggression	0.34	.26	1.31	1.49	.39	3.83***
Centrality	-0.41	.16	-2.65**	-0.61	.23	-2.64**
Gender	-0.07	.48	-0.14	-0.81	.64	-1.26
Friendship	-0.30	.26	-1.18	-0.17	.39	-0.45
Clique gender	-0.21	.35	-0.61	0.60	.41	1.45
Clique grade	-0.34	.11	-3.07***	-0.57	.13	-4.22***

Note. Centrality is coded 1 = central, 2 = secondary, and 3 = peripheral. Gender is coded 1 = boy and 2 = girl.

**p* < .05.

***p* < .01.

****p* < .001.

for aggression, centrality, and grade, but these variables did not interact significantly with victimization and thus are not considered further.

Discussion

Membership in interaction-based peer cliques is coveted in late childhood and early adolescence, occupying a large portion of children's time at school and influencing their values, beliefs, and behavior (Hartup, 2009). To date, victimized children's participation in this pivotal social context has not been examined extensively. We assessed the quality of victimized children's clique participation at school and the potential shield provided by clique membership against victimization over a school year. Given previous findings that victimized children are mostly disliked by classmates and have few (e.g., Scholte et al., 2009) or low-quality friendships (e.g., Kendrick et al., 2012), we expected to find them at the margins of the social network at school, in small, unstable, or loosely connected clusters with other victims and possibly aggressive children, and being treated negatively by their cliquemates. Some of these expectations were confirmed, but there were surprises, as well.

Characterizing the Clique Participation of Victimized Children

As we anticipated, several aspects of victimized children's clique membership reflected their social marginalization. On average, their cliques were more peripheral in the larger peer network and less closely knit than were cliques of nonvictimized children. Within their cliques, victimized children were more peripheral members, had a lower proportion of reciprocal friends, and were less stable members over the year. Our observations of clique interaction in the limited resource activity indicated that cliquemates treated victimized children more negatively, refusing or ignoring their requests for the control, forcefully taking the remote control from them, and making negative comments about their play. Together, these findings suggest that some victimized children may have been *hanging on* to the clique (Brown, 1990) rather than *hanging out* with their cliquemates as equal interactional partners.

Fortunately, this bleak characterization did not apply to all victimized children. The majority (78.9%) were not at the extreme periphery of their cliques, and many had reciprocated friendships among cliquemates and maintained their clique membership over the school year. Moreover, victimized children's cliques did not differ in size or stability from those of nonvictimized children. We cannot rule out the possibility that their cliques

contained children who occupied other unassessed bullying participant roles, such as defenders, bully reinforcers, or bully assistants (Salmivalli et al., 1996), but most victimized children's cliques did not include disproportionate numbers of victimized or aggressive children. Thus, although we found important differences in the quality of victimized and nonvictimized children's clique participation, the differences did not support a strong view of victimized children as disenfranchised members of the larger peer network.

Relating Clique Participation to Victimization Over the School Year

Victimization was tenacious over the school year (Cillessen & Lansu, 2015), but several aspects of clique participation mitigated victimization to some degree. High and low clique power, as reflected by clique aggression and victimization, related to end-of-year victimization in a manner that paralleled findings on friendship (Hodges et al., 1997; Pellegrini et al., 1999). Victimization was mitigated by membership in cliques that were highly aggressive and exacerbated by membership in cliques that were highly victimized. Aggressors might have desisted from persecuting victims whose aggressive cliquemates could retaliate effectively on their behalf (Hodges et al., 1997) and instead were drawn to clusters of low-power individuals who were unable to defend one another.

Within cliques, having a greater proportion of friends mitigated victimization, as we anticipated. Children likely refrained from victimizing and were more prone to defend cliquemates in whom they were more affectively invested. More novel to the present study, centrality within the clique also was protective. Although the relative safety enjoyed by central clique members may reflect the social privileges (e.g., deference or respect) generally accrued by group leaders, protection of clique-defining members might have been motivated also by the desire to preserve the clique itself, a social unit on which members depended. Additional research is needed to identify the social and psychological processes that render within-clique centrality a protective factor.

Unexpectedly, centrality of the clique within the larger social network, and density of friendship ties among clique members, did *not* protect clique members from victimization. Thus, privileges accrued by clique members based on the *clique's* prominence or interpersonal closeness did not inevitably extend to all clique members, and children within the same clique likely had very different social experiences (Sherif, Harvey, White, Hood, & Sherif, 1961/1988). These findings have important implications for researchers who study clique (or group) influences on children's behavior

and adjustment. A more nuanced approach, in which between-clique (e.g., Ellis & Zabatany, 2007) *and* within-clique variability are considered likely will reveal greater heterogeneity in the effects of peer group influence than has been reported to date (see also Ellis, Dumas, Mahdy, & Wolfe, 2012; Pattiselanno, Dijkstra, Steglich, Vollebergh, & Veenstra, 2015).

Our analyses also did not produce significant interactions involving child victimization and aggression either in characteristics of clique membership or in predictions of victimization over time. Thus, we produced no evidence that clique experiences were appreciably worse for aggressive victims than nonaggressive victims. However, consistent with previous research (e.g., Solberg et al., 2007), aggressive victims comprised only a small proportion (16%) of the victimized children in our study. Consequently, further research is needed with larger samples of aggressive victimized children to better address this question. As an added bonus of larger samples, aggressive victims could be further differentiated by type of aggression perpetrated (overt or relational) to identify any unique clique-related difficulties.

Practical Implications

Our findings have several practical implications for adults who strive to improve the social experiences of victimized children. Although membership in large, highly prominent, or affectively close cliques may be alluring for potential status enhancement and safety, not all victimized children are likely to achieve fully integrated membership in these cliques. Those who remain marginal members may not be protected from maltreatment, even from their new cliquemates (Hogg, 2005). Instead, they should be encouraged to cluster with existing friends, peers who have the potential to become friends, or peers with whom they can achieve equal standing in the course of shared activities. As allegiance and affection grow, victimized children may be better defended by their cliquemates. Educators should be mindful that safety in numbers will not be achieved when victimized children group together at school. Though it may be risky to encourage their affiliation with aggressive peers, victimized children need to form relationships with peers who are both willing *and* able to defend them (Pöyhönen, Juvonen, & Salmivalli, 2010). These recommendations may be more easily implemented for children at the younger end of our sample because victimization was somewhat less stable for this age group. For early adolescents, peer attitudes toward victimized children are more entrenched, and additional measures likely will be needed to change their behavior (Yeager et al., 2015).

Our behavioral observations indicate that cliquemates may be a source of maltreatment for at least some victimized children. In such cases, leaving the clique may seem an obvious strategy for ending victimization. However, victimized children may be reluctant to do so if they have no alternative clique to join (Hogg, 2005). This problem was brought to life poignantly by Alex Libby in the documentary *Bully* (Hirsch & Lowen, 2011) in response to his mother's concerns about the perpetrators who victimized him on the school bus. Alex replied, "If you say these aren't my friends, then what friends do I have?" For children who are poorly treated by cliquemates, efforts should be made to provide safe social niches both at school, and away from school, in extracurricular activities with peers who share similar interests.

Limitations

This study had many positive features, including a large sample of children and cliques, use of conservative cutoffs to identify victimized children, behavioral observations of clique interactions, and simultaneous examination of individual and clique factors in the multilevel longitudinal prediction of victimization. Moreover, many of the findings emerged as we anticipated. However, the study also had several limitations. First, although participation rates were high, if nonparticipants included victimized children who were not observed by age-mates because they were not members of peer groups, we may have overestimated victimized children's clique participation. Second, our sample was drawn from primary schools (kindergarten to Grade 8) with a maximum of three classes, and most often two classes per grade. Many of the children had been together since kindergarten, and victimized children's familiarity with peers may have resulted in higher rates of clique participation than would be observed among children who were negotiating formation of new cliques during the transition to middle school (Pellegrini & Long, 2002). Third, we focused on children's primary clique affiliations based on the expectation that their spring victimization levels would be most influenced by the clique with which they spent most time. However, for multiclique members, the effect of cumulative clique membership may be a better predictor of victimization outcomes than is primary clique membership, especially if experiences in different cliques differ qualitatively. Finally, we cannot make strong causal claims about moderation of victimization by clique experiences. Unmeasured attributes and abilities (e.g., extraversion and social skills) that enabled some victimized children to achieve central status and friendships within their cliques also may have facilitated change in their victimization over time.

Future Directions

Our findings that cliquemates may be a source of some victimized children's ill treatment call for additional research on the relationship dynamics associated with victimization (Craig, Pepler, Murphy, & McCuaig-Edge, 2010) and the interpersonal conditions under which clique members may play a protective role. Observations of cliques on the school playground from a discrete distance (Hawkins et al., 2001), and identification of victimized children's bullies (Rodkin & Berger, 2008) and defenders (Pöyhönen et al., 2010), would help to determine whether victimized children are targeted mostly by cliquemates, outsiders, or both, and the role played by cliquemates when victimized children are harassed by peers outside of their clique. Variation in treatment by cliquemates and outsiders could be further assessed as a function of victimized children's within-clique centrality and friendship, and clique aggression, to determine how these protective factors play out in everyday life. This research could be augmented by experimental work that examines clique protection of cliquemates under conditions that maximize within-group solidarity, such as when competition for scarce resources occurs *between* rather than within cliques (Sherif et al., 1961/1988).

The role of gender in victimized children's clique experiences also requires more detailed examination. We unexpectedly found that cliques containing victimized children were more likely to be mixed gender than were cliques containing no victims. Though most victimization is perpetrated by same-sex peers, other-sex bullying is common, especially involving male perpetrators (Sainio, Veenstra, Huitsing, & Salmivalli, 2012). It will be important for future researchers to establish whether membership in mixed-gender cliques increases children's victimization risk, and whether a broader array of children are targeted in mixed-gender than same-gender cliques (Sainio et al., 2012).

Finally, recent evidence suggests that classrooms vary in degree of centralization of victimization or the extent to which victimization is focused on few versus many class members. Centralized victimization portends a hierarchical social organization within classrooms associated with greater dislike and maltreatment of class members over time (Serdiouk, Rodkin, Madill, Logis, & Gest, 2015). Further research is needed to determine whether the protective role of clique membership provides a safety net or weakens against such classroom-level hierarchical structures, and whether membership in certain types of cliques (e.g., aggressive) is needed to stave off maltreatment of clique members who are markedly singled out as targets of classmate dislike and aggression.

Conclusions

In this study, we showed that victimized children overwhelmingly (93%) participated in peer cliques. Reflecting their lower status compared to non-victimized children, they were more peripheral members and less closely tied to cliquemates in cliques that were themselves more peripheral in the larger peer network and less emotionally close. Our behavioral observations provide evidence that negative treatment of victimized children may be perpetrated by their cliquemates, and indicate that clique life for some may be a source of grief rather than sanctuary. Importantly, victimized children's clique experiences varied considerably, and those who were more central clique members, had closer relationships with cliquemates, or whose cliquemates were more aggressive, were better protected from victimization over time. Our findings emphasize the value of investigating cliques to more fully capture victimized children's protective experiences with peers at school.

References

- Adler, P. A., & Adler, P. (1998). *Peer power: Preadolescent culture and identity*. New Brunswick, NJ: Rutgers University Press.
- Bagwell, C. L., Coie, J. D., Terry, R. A., & Lochman, J. E. (2000). Peer clique participation and social status in preadolescence. *Merrill-Palmer Quarterly*, *46*, 280–305.
- Boivin, M., & Hymel, S. (1997). Peer experiences and social self-perceptions: A sequential model. *Developmental Psychology*, *33*, 135–145. doi:10.1037/0012-1649.33.1.135
- Boulton, M. J. (1999). Concurrent and longitudinal relations between children's playground behavior and social preference, victimization, and bullying. *Child Development*, *70*, 944–954. doi:10.1111/1467-8624.00068
- Brown, B. B. (1990). Peer groups and peer cultures. In S. S. Feldman & G. R. Elliott (Eds.), *At the threshold: The developing adolescent* (pp. 171–196). Cambridge, MA: Harvard University Press.
- Brown, B. B., & Dietz, E. L. (2009). Informal peer groups in middle childhood and adolescence. In K. H. Rubin, W. M. Bukowski, & B. Laursen (Eds.), *Handbook of peer interactions, relationships, and groups* (pp. 361–376). New York: Guilford Press.
- Bukowski, W. M., Castellanos, M., Vitaro, F., & Brendgen, M. (2015). Socialization and experiences with peers. In J. E. Grusec & P. D. Hastings (Eds.), *Handbook of socialization: Theory and research* (2nd ed., pp. 228–250). New York: Guilford Press.
- Cairns, R. B., Cairns, B. D., Neckerman, H. J., Gest, S. D., & Gariepy, J.-L. (1988). Social networks and aggressive behavior: Peer support or peer rejection? *Developmental Psychology*, *24*, 815–823. doi:10.1037/0012-1649.24.6.815

- Cairns, R. B., Leung, M.-C., Buchanan, L., & Cairns, B. D. (1995). Friendships and social networks in childhood and adolescence: Fluidity, reliability, and interrelations. *Child Development, 66*, 1330–1345. doi:10.2307/1131650
- Cairns, R. B., Perrin, J. E., & Cairns, B. D. (1985). Social structure and social cognition in early adolescence: Affiliative patterns. *Journal of Early Adolescence, 5*, 339–355. doi:10.1177/0272431685053007
- Charlesworth, W. R., & Dzur, C. (1987). Gender comparisons of preschoolers' behavior and resource utilization in group problem solving. *Child Development, 58*, 191–200. doi:10.2307/113030
- Cillessen, A. H. N., & Lansu, T. A. M. (2015). Stability, correlates, and time-covarying associations of peer victimization for Grade 4 to 12. *Journal of Clinical Child & Adolescent Psychology, 44*, 456–470. doi:10.1080/15374416.2014.958841
- Craig, W. M., Pepler, D. J., Murphy, A., & McCuaig-Edge, H. (2010). What works in bullying prevention? In E. M. Vernberg & B. K. Biggs (Eds.), *Preventing and treating bullying and victimization* (pp. 215–241). New York: Oxford University Press.
- Crick, N. R., & Bigbee, M. A. (1998). Relational and overt forms of peer victimization: A multiinformant approach. *Journal of Consulting and Clinical Psychology, 66*, 337–347. doi:10.1037/0022-006X.66.2.337
- Crick, N. R., & Grotpeter, J. K. (1995). Relational aggression, gender, and social-psychological adjustment. *Child Development, 66*, 710–722. doi:10.2307/1131945
- Crick, N. R., & Nelson, D. A. (2002). Relational and physical victimization within friendships: Nobody told me there'd be friends like these. *Journal of Abnormal Child Psychology, 30*, 599–607. doi:10.1023/A:1020811714064
- Crockett, L., Losoff, M., & Petersen, A. C. (1984). Perceptions of the peer group and friendship in early adolescence. *Journal of Early Adolescence, 4*, 155–181. doi:10.1177/0272431684042004
- Ellis, W. E., Dumas, T. M., Mahdy, J. C., & Wolfe, D. A. (2012). Observations of adolescent peer group interactions as a function of within- and between-group centrality status. *Journal of Research on Adolescence, 22*, 252–266. doi:10.1111/j.1532-7795.2011.00777.x
- Ellis, W. E., & Zarbatany, L. (2007). Peer group status as a moderator of group influence on children's deviant, aggressive, and prosocial behavior. *Child Development, 78*, 1240–1254. doi:10.1111/j.1467-8624.2007.01063.x
- Enders, C. K., & Tofighi, D. (2007). Centering predictor variables in cross-sectional multilevel models: A new look at an old issue. *Psychological Methods, 12*, 121–138. doi:10.1037/1082-989X.12.2.121
- Estell, D. B., Farmer, T. W., & Cairns, B. D. (2007). Bullies and victims in rural African American youth: Behavioral characteristics and social network placement. *Aggressive Behavior, 33*, 145–159. doi:10.1002/ab.20176

- Faris, R., & Felmlee, D. (2014). Casualties of social combat: School networks of peer victimization and their consequences. *American Sociological Review, 79*, 228–257. doi:10.1177/0003122414524573
- Farmer, T. W., Petrin, R. A., Robertson, D. L., Fraser, M. W., Hall, C. M., Day, S. H., & Dadisman, K. (2010). Peer relations of bullies, bully-victims, and victims: The two social worlds of bullying in second-grade classrooms. *Elementary School Journal, 110*, 364–392. doi:10.1086/648983
- Farmer, T. W., & Xie, H. (2013). Manufacturing phenomena or preserving phenomena? Core issues in the identification of peer social groups with social cognitive mapping procedures. *Social Development, 22*, 595–603. doi:10.1111/j.1467-9507.2012.00669.x
- Fox, C. L., & Boulton, M. J. (2006). Friendship as a moderator of the relationship between social skills problems and peer victimisation. *Aggressive Behavior, 32*, 110–121. doi:10.1002/ab.20114
- French, D. C., Chen, X., Chung, J., Li, M., Chen, H., & Li, D. (2011). Four children and one toy: Chinese and Canadian children faced with potential conflict over a limited resource. *Child Development, 82*, 830–841. doi:10.1111/j.1467-8624.2011.01581.x
- Gest, S. D., Davidson, A. J., Rulison, K. L., Moody, J., & Welsh, J. A. (2007). Features of groups and status hierarchies in girls' and boys' early adolescent peer networks. In P. C. Rodkin & L. D. Hanish (Eds.), *Social network analysis and children's peer relationships* (pp. 43–60). San Francisco: Jossey-Bass.
- Gest, S. D., Farmer, T., Cairns, B., & Xie, H. (2003). Identifying children's peer social networks in school classrooms: Links between peer reports and observed interactions. *Social Development, 12*, 513–529. doi:10.1111/1467-9507.00246
- Gest, S. D., Graham-Bermann, S. A., & Hartup, W. W. (2001). Peer experience: Common and unique features of number of friendships, social network centrality, and sociometric status. *Social Development, 10*, 23–40. doi:10.1111/1467-9507.00146
- Gest, S. D., Moody, J., & Rulison, K. L. (2007). Density or distinction? The roles of data structure and group detection methods in describing adolescent peer groups. *Journal of Social Structure, 8*(1). Retrieved from <https://www.cmu.edu/joss/content/articles/volume8/GestMoody/>
- Hartup, W. W. (2009). Critical issues and theoretical viewpoints. In K. H. Rubin, W. M. Bukowski, & B. Laursen (Eds.), *Handbook of peer interactions, relationships, and groups* (pp. 3–19). New York: Guilford Press.
- Hawkins, D. L., Pepler, D. J., & Craig, W. M. (2001). Naturalistic observations of peer interventions in bullying. *Social Development, 10*, 512–527. doi:10.1111/1467-9507.00178
- Hirsch, L. (Director, Producer) & Lowen, C. (Producer). (2011). *Bully* [Motion picture]. USA: Bully Project.

- Hodges, E. V. E., Boivin, M., Vitaro, F., & Bukowski, W. M. (1999). The power of friendship: Protection against an escalating cycle of peer victimization. *Developmental Psychology, 35*, 94–101. doi:10.1037/0012-1649.35.1.94
- Hodges, E. V. E., Malone, M. J., Jr., & Perry, D. G. (1997). Individual risk and social risk as interacting determinants of victimization in the peer group. *Developmental Psychology, 33*, 1032–1039. doi:10.1037/0012-1649.33.6.1032
- Hodges, E. V. E., & Perry, D. G. (1999). Personal and interpersonal antecedents and consequences of victimization by peers. *Journal of Personality and Social Psychology, 76*, 677–685. doi:10.1037/0022-3514.76.4.677
- Hogg, M. A. (2005). All animals are equal but some animals are more equal than others: Social identity and marginal membership. In K. D. Williams, J. P. Forgas, & W. von Hippel (Eds.), *The social outcast: Ostracism, social exclusion, rejection, and bullying* (pp. 243–261). New York: Psychology Press.
- Kendrick, K., Jutengren, G., & Stattin, H. (2012). The protective role of supportive friends against bullying perpetration and victimization. *Journal of Adolescence, 35*, 1069–1080. doi:10.1016/j.adolescence.2012.02.014
- Kindermann, T. A. (2007). Effects of naturally existing peer groups on changes in academic engagement in a cohort of sixth graders. *Child Development, 78*, 1186–1203. doi:10.1111/j.1467-8624.2007.01060.x
- Kindermann, T. A., & Skinner, E. A. (2012). Will the real peer group please stand up? A “tensegrity” approach to examining the synergistic influences of peer groups and friendship networks on academic development. In A. M. Ryan & G. W. Ladd (Eds.), *Peer relationships and adjustment at school* (pp. 51–78). Charlotte, NC: Information Age.
- Malcolm, K. T., Jensen-Campbell, L. A., Rex-Lear, M., & Waldrip, A. M. (2006). Divided we fall: Children’s friendships and peer victimization. *Journal of Social and Personal Relationships, 23*, 721–740. doi:10.1177/0265407506068260
- Masten, A. S., Morison, P., & Pellegrini, D. S. (1985). A Revised Class Play method of peer assessment. *Developmental Psychology, 21*, 523–533. doi:10.1037/0012-1649.21.3.523
- Nansel, T. R., Craig, W., Overpeck, M. D., Saluga, G., Ruan, W. J., & the Health Behavior in School-aged Children Bullying Analyses Working Group (2004). Cross-national consistency in the relationship between bullying behaviors and psychosocial adjustment. *Archives of Pediatric & Adolescent Medicine, 158*, 730–736. doi:10.1001/archpedi.158.8.730
- Neal, J. W., & Neal, Z. P. (2013). The multiple meanings of peer groups in social cognitive mapping. *Social Development, 22*, 580–594. doi:10.1111/j.1467-9507.2012.00656.x
- Neal, Z. P., & Neal, J. W. (2013). Opening the black box of social cognitive mapping. *Social Development, 22*, 604–608. doi:10.1111/j.1467-9507.2012.00668.x

- Newcomb, A. F., & Bagwell, C. L. (1995). Children's friendship relations: A meta-analytic review. *Psychological Bulletin, 11*, 306–347. doi:10.1037/0033-2909.117.2.306
- Pattiselanno, K., Dijkstra, J. K., Steglich, C., Vollebbergh, W., & Veenstra, R. (2015). Structure matters: The role of clique hierarchy in the relationship between adolescent social status and aggression and prosociality. *Journal of Youth and Adolescence, 44*, 2257–2274. doi:10.1007/s10964-015-0310-4
- Pellegrini, A. D., Bartini, M., & Brooks, F. (1999). School bullies, victims, and aggressive victims: Factors relating to group affiliation and victimization in early adolescence. *Journal of Educational Psychology, 91*, 216–224. doi:10.1037/0022-0663.91.2.216
- Pellegrini, A. D., & Long, J. D. (2002). A longitudinal study of bullying, dominance, and victimization during the transition from primary school through secondary school. *British Journal of Developmental Psychology, 20*, 259–280. doi:10.1348/026151002166442
- Perren, S., & Alsaker, F. D. (2006). Social behavior and peer relationships of victims, bully-victims, and bullies in kindergarten. *Journal of Child Psychology and Psychiatry, 47*, 45–57. doi:10.1111/j.1469-7610.2005.01445.x
- Peugh, J. L. (2010). A practical guide to multilevel modeling. *Journal of School Psychology, 48*, 85–112. doi:10.1016/j.jsp.2009.09.002
- Pöyhönen, V., Juvonen, J., & Salmivalli, C. (2010). What does it take to stand up for the victim of bullying? The interplay between personal and social factors. *Merrill-Palmer Quarterly, 56*, 143–163. doi:10.1353/mpq.0.0046
- Preacher, K. J., Curran, P. J., & Bauer, D. J. (2006). Computational tools for probing interaction effects in multiple linear regression, multilevel modeling, and latent curve analysis. *Journal of Educational and Behavioral Statistics, 31*, 437–448. doi:10.3102/10769986031004437
- Rodkin, P. C., & Berger, C. (2008). Who bullies whom? Social status asymmetries by victim gender. *International Journal of Behavioral Development, 32*, 473–485. doi:10.1177/0165025408093667
- Rose, A. J., & Rudolph, K. D. (2006). A review of sex differences in peer relationship processes: Potential trade-offs for the emotional and behavioral development of girls and boys. *Psychological Bulletin, 132*, 98–131. doi:10.1037/0033-2909.132.1.98
- Sainio, M., Veenstra, R., Huising, G., & Salmivalli, C. (2012). Same- and other-sex victimization: Are the risk factors similar? *Aggressive Behavior, 38*, 442–455. doi:10.1002/ab.21445
- Salmivalli, C., Huttunen, A., & Lagerspetz, K. M. J. (1997). Peer networks and bullying in school. *Scandinavian Journal of Psychology, 38*, 305–312. doi:10.1111/1467-9450.00040

- Salmivalli, C., Lagerspetz, K., Björkqvist, K., Österman, K., & Kaukiainen, A. (1996). Bullying as a group process: Participant roles and their relations to social status within the group. *Aggressive Behavior*, 22, 1–15. doi:10.1002/(SICI)1098-2337(1996)22:1
- Salmivalli, C., Lappalainen, M., & Lagerspetz, K. (1998). Stability and change of behavior in connection with bullying in schools: A two-year follow-up. *Aggressive Behavior*, 24, 205–218. doi:10.1002/(SICI)1098-2337(1998)24:3
- Scholte, R. H. J., Overbeek, G., ten Brink, G., Rommes, E., de Kemp, R. A. T., Goossens, L., & Engels, R. C. M. E. (2009). The significance of reciprocal and unilateral friendships for peer victimization in adolescence. *Journal of Youth and Adolescence*, 38, 89–100. doi:10.1007/s10964-008-9287-6
- Schwartz, D., Proctor, L. J., & Chien, D. H. (2001). The aggressive victim of bullying: Emotional and behavioral dysregulation as a pathway to victimization by peers. In J. Juvonen & S. Graham (Eds.), *Peer harassment in school: The plight of the vulnerable and victimized* (pp. 147–174). New York: Guilford Press.
- Sentse, M., Dijkstra, J. K., Salmivalli, C., & Cillessen, A. H. N. (2013). The dynamics of friendships and victimization in adolescence: A longitudinal social network perspective. *Aggressive Behavior*, 39, 229–238. doi:10.1002/ab.21469
- Serdiouk, M., Rodkin, P., Madill, R., Logis, H., & Gest, S. (2015). Rejection and victimization among elementary school children: The buffering role of classroom-level predictors. *Journal of Abnormal Child Psychology*, 43, 5–17. doi:10.1007/s10802-013-9826-9
- Sherif, M., Harvey, O. J., White, B. J., Hood, W. R., & Sherif, C. W. (1961/1988). *The Robbers Cave experiment: Intergroup conflict and competition*. Middletown, CT: Wesleyan University Press.
- Solberg, M. E., Olweus, D., & Endresen, I. M. (2007). Bullies and victims at school: Are they the same pupils? *British Journal of Educational Psychology*, 77, 441–464. doi:10.1348/000709906X105689
- Wolke, D., Copeland, W. E., Angold, A., & Costello, E. J. (2013). Impact of bullying in childhood on adult health, wealth, crime, and social outcomes. *Psychological Science*, 24, 1958–1970. doi:10.1177/0956797613481608
- Yeager, D. S., Fong, C. J., Lee, H. Y., & Espelage, D. L. (2015). Declines in efficacy of anti-bullying programs among older adolescents: Theory and a three-level meta-analysis. *Journal of Applied Developmental Psychology*, 37, 36–51. doi:10.1016/j.appdev.2014.11.005
- Zimmer-Gembeck, M. J., Pronk, R. E., Goodwin, B., Mastro, S., & Crick, N. R. (2013). Connected and isolated victims of relational aggression: Associations with peer group status and differences between girls and boys. *Sex Roles*, 68, 363–377. doi:10.1007/s11199-012-0239-y

The Positive Adjustment of Low-Income Youths With Relational and Community Support: The Mediating Role of Hope

Eddie C. W. Ng *Hong Kong Polytechnic University*

Jasmine K. M. Lam *University of Hong Kong*

Charles C. H. Chan *Hong Kong Polytechnic University*

Youths living in poverty may experience less developmental support. Although the importance of hope, relational support, and community support for positive adaptation is acknowledged, how they combine to affect psychosocial adjustment is unknown. This study, drawing on 830 low-income youths (11–18 years old) in Hong Kong, provides evidence that hope, relational support, and community support are highly predictive of psychosocial adjustment (measured by goal setting, academic aspiration, extracurricular-activity participation, and economic worry about the future). Structural equation modeling further demonstrates the important mediating role of hope in influencing relational and community support with regard to positive adjustment, and the differential mechanism of how specific adjustment outcome could be promoted.

Increasing the internal and external resources of children is the key to positive development or resistance to negative outcomes (Masten, 2001; Scales, Leffert, & Lerner, 2004). Whittaker, Schinke, and Gilchrist (1986)

Dr. Chan passed away in June 2017.

Eddie C. W. Ng and Charles C. H. Chan, Department of Applied Social Science; and Jasmine K. M. Lam, Department of Psychology.

We gratefully acknowledge the Hong Kong Church Network for the Poor for providing grants to support this study, and four organizations (Baptist Oi Kwan Social Service, Christian Action, Industrial Evangelistic Fellowship, and the Urban Peacemaker Evangelistic Fellowship, respectively) for their assistance in data collection and as informants for this study. The authors also thank Shu Fai Cheung for providing insightful suggestions that helped shape a key point in this article.

Address correspondence to Eddie C. W. Ng, Department of Applied Social Science, Hong Kong Polytechnic University, Hong Kong. Phone: +852-2766-5773. Fax: +852-2773-6558. E-mail: chiwai.ng@live.vu.edu.au.

Merrill-Palmer Quarterly, October 2017, Vol. 63, No. 4, pp. 514–542. doi: 10.13110/merrpalmquar 1982.63.4.0514 Copyright © 2018 by Wayne State University Press, Detroit, MI 48201.

also argue that, for service programs for children, youths, and families to be effective, a dual emphasis on both providing external support and improving personal competence must be adopted. In the literature, the importance of hope, relational support, and community support toward positive adaptation is acknowledged (Herrero & Gracia, 2007; Li & Julian, 2012; Schmid et al., 2011), but how they combine to affect psychosocial adjustment is not clearly understood. This study is meant to provide valuable empirical evidence of the importance of hope, relational support, and community support in the positive adjustment of low-income youths in the Chinese context and to examine whether hope precedes relational/community support or follows from it.

Hope and Positive Adjustment

Hope appeals to scientific inquiry, whether in public health (Coughlin, 2006) or in positive psychology research (Snyder & Lopez, 2002). While it can be understood as an emotion (Lazarus, 1999), the more commonly used conceptualization of hope is Snyder's cognitive approach, which emphasizes the goal and its cognitive process in goal pursuit. According to Snyder (1994, 2002), hope is a positive motivational state, which includes both sense of successful agency (goal-directed determination) and pathways (planning to meet a goal). In other words, people with hope are not only more determined but also motivated to find ways to achieve their goal. Whatever the stance, hope can be considered a resource while facing various life challenges. The benefit of hope for positive adaptation and psychosocial adjustment has also been documented. For example, Snyder (2002) summarized that high-hope persons are better off than their low-hope counterparts in many areas, such as academic performance, physical health, and psychological adjustment. Schmid et al. (2011) also highlighted that adolescents' hope for the future is a critical individual strength leading to youths' positive development. In addition to promoting positive adjustment, hope appears to be an antidote to negative outcomes, such as despair (Snyder, 2002) or risky behaviors (Borowsky, Ireland, & Resnick, 2009).

Relational and Community Support and Positive Adjustment

Apart from the personal attribute, other resources for positive change could be interpersonal or societal. Not only have intimate relationships been shown to be important to children and adolescents (Scales, Benson, & Roehlkepartain, 2011; Thompson, 2014), the community as a relevant resource and support has also attracted more attention (Herrero & Gracia, 2007; Nowell & Boyd, 2010).

Importance of relational support for youths. Family relationship and support have an undeniable influence on youth development. Research results on poverty also suggest that the link between economic stress and poor child adjustment is mediated by parents facing a higher level of psychological stress who reduce warmth and increase harshness with the teens (Huston & Bentley, 2010). In addition to the family, friends or adults outside the family (such as kin or mentors) are important sources of relational support for youths. According to Thompson (2014), the relationship provides not only emotional encouragement and support in times of stress but also advice, guidance, and access to information or material resources. Furthermore, the relationship could contribute to skill acquisition (e.g., mentors), facilitate social monitoring, or detect early disruptive symptoms before their onset. Sterrett, Jones, McKee, and Kincaid (2011) also concluded that nonparental adults could play a significant role in facilitating adolescent psychosocial functioning, particularly in the areas of academic functioning and self-esteem, and reducing the behavior or emotional problems. Li and Julian (2012) also argued that developmental relationships are the active ingredient of effective interventions for at-risk youths because the developmental relationship characterized by enduring emotional attachment could promote mutual human interaction, resulting in children displaying more complex behavior patterns progressively and becoming more independent (i.e., shifting the balance of power toward youths).

Importance of community supports for youths. In addition to the relational support, viewing the community as a resource has recently attracted scholarly attention (Herrero & Gracia, 2007; Nowell & Boyd, 2010). The associated concepts related to community, such as a sense of community, social integration, or social capital, reveal that the community as a setting matters a lot to a person, whether subjectively or objectively. It not only provides individuals with a sense of belonging and interdependence but also offers them tangible support and opportunities to access relevant resources. While studies of the neighborhood effect on children and youths have a long history (Leventhal & Brooks-Gunn, 2000), more studies focus on the structural aspects of neighborhoods (such as income and employment rates) than on the social, organizational characteristics of communities (such as community ties or social cohesion). This study thus examined the extent to which community support affects adolescents' adjustment, which, as Leventhal and Brooks-Gunn (2000) also agreed, is more useful for understanding the process through which neighborhoods might influence children and youths. Ng, Chan, and Lai's (2014) study findings indicate that perceived community support is associated with life satisfaction in low-income groups. Herrero and Gracia (2007) also found that

community support is associated with a reduction in depressive symptoms after 6 months. Certainly, more studies are needed.

Nevertheless, a sad phenomenon is that not every youth has an equal share or the same level of support. Regarding those being raised in single-parent households (Sterrett et al., 2011), Scales et al. (2011) also observed that adolescents receive less relational/community support as compared to their younger counterparts. In their study regarding whether American children and youths are adequately supported and cared for, Scales et al. observed that, whereas over 90% of teenagers aged 6–8 and 9–11 meet the criteria of having caring adults in their lives, the proportion dropped to only 70% for those aged 15–17 (Scales et al., 2006), perhaps because adolescents are expected to start living an independent life, leaving them less monitoring and support. The challenge is even more severe for youths living in poverty. When their parents experience significant difficulty or parent–child relationships are troubled, low-income children are vulnerable because they are less likely to access alternative sources of support. Scales et al. (2006) also noticed that one of three youths from the poorest families do not meet the criteria (of having caring adults), as compared to one in five teenagers from the highest-income family group. Thus, for the disadvantaged group, supportive associations outside the family can be important for adolescents' coping.

The Purpose of the Present Study

In the context of Hong Kong, the wealth disparity between the rich and the poor is severe, given the extremely high property prices and the social welfare policy, which tends to be minimal and incremental to avoid creating a welfare-dependent culture (Wong, 2000). Needless to say, unemployed people and full-time workers also face much pressure. According to government statistics (Labour Department, 2012) and local trade unions (Hong Kong Confederation of Trade Unions, 2015), Hong Kong is a city with long working hours, as nearly one out of every ten employees in Hong Kong has to work more than 60 hr a week to make ends meet. Thus, it is reasonably expected that minimal time and support are left for children of the working class/low-income groups. Furthermore, young people living in deprived areas will be further marginalized because of the lack of services or limited opportunities available for their development. Thus, tragedies (e.g., family violence or suicidal teenagers) are not uncommon in some poverty-stricken districts (see Tsang & Chu, 2010).

This study sought to assess the extent to which relational support, perceived community support, and hope predict positive adjustment in

low-income youths in a Chinese context. First, we aim to examine whether the relationships apply to multiple indicators of psychosocial adjustment instead of a single outcome (typically investigated in previous studies). We focused on four indicators—namely, goal setting, academic aspiration, participation in extracurricular activity, and future economic worry—because these indicators not only have been shown to relate to the intervening variables (i.e., hope, relational support, and community support) but also are relevant to the youth population or some are particularly important to the children from a disadvantaged background. For example, goal pursuit is a useful self-regulatory strategy (Oettingen, Pak, & Schnetter, 2001) and conducive to positive youth development (Damon, Menon, & Cotton Bronk, 2003). Studies show that goal setting could critically differentiate the youths at risk from those not at risk (Carroll, Durkin, Hattie, & Houghton, 1997) and has been proved to be associated with hope (Burrow, O'Dell, & Hill, 2010) and interpersonal support (Ng & Chan, 2017). Academic functioning and success are not only salient in youth (Masten et al., 2005) but also have been shown to be predicted by hope and parental or nonparental adult support (Cutrona, Cole, Colangelo, Assouline, & Russell, 1994; Snyder et al., 2002; Sterrett et al., 2011). Regarding extracurricular activities, Larson (2000) suggested that structured voluntary activities are the ideal context for developing personal agency and initiative. Blomfield and Barber (2011) even notice that the extracurricular activities are particularly beneficial to the general self-worth and social and academic self-concept for youths from schools with low socioeconomic status, signifying that the positive developmental experience gained during extracurricular activities is particularly important for disadvantaged young people. Even though Bohnert, Martin, and Garber's (2007) study found that family relationship quality is associated with adolescents' participation in organized activities, more studies are needed so as to discover more about the antecedents. Last but not least, economic worry about the future is certainly not a good sign for positive adjustment. Studies (e.g., Shah, Mullainathan, & Shafir, 2012) even discovered that financial concern, typically characterized by poverty, will shift people's attention (such as focusing only on immediate concerns rather than having a long-term plan), resulting in riskier or less reasoned behavior. This understanding is particularly relevant to the underprivileged population because negative behavior, such as overborrowing, will further snarl the upward flow of the poor. Thus, it will be useful to understand whether hope and relational and community support could promote the protective factors and mitigate negative moods regarding the adolescents' future.

H1: We hypothesized that having a higher level of hope and relational support and a stronger sense of community support would be associated

with higher levels of psychosocial adjustment (measured by goal setting, academic aspiration, participation in extracurricular activity, and future economic worry).

Second, we also want to investigate how relational support, perceived community support, and hope combine to affect the positive adjustment of young people from a disadvantaged background. In particular, we would like to know whether hope precedes social support or follows from it, which is a question that is with mixed results in the literature. Stoddard, McMorris, and Sieving's (2011) study of 164 middle-school students found that both social connectedness and hopefulness protect against violence, but hopefulness mediates the relationship between school connectedness (though not family connectedness) and violence. Nevertheless, Ng et al.'s (2014) study of 150 low-income children (aged 7–12) in Hong Kong demonstrated that, while both hopeful thinking and perceived community support predict children's satisfaction with life, perceived community support plays a critical role in mediating the influence of hope on life satisfaction. The two studies seem to contradict each other. Whereas Stoddard et al.'s results signify the importance of social relationship and environmental support, Ng et al.'s findings appear to suggest that youths with a higher level of hope may be more likely to search for community support, resulting in higher levels of life satisfaction. Nevertheless, what is common in these two studies is that both the individual characteristics and ecological resources/assets are relevant to adolescents' positive development. What is to be further determined is the dominant role between the individual and the environmental resources. Whether external resources provide the basis for personal hope or whether personal hope drives the person to explore external resources, which one finally leads to better adjustment? Certainly, these findings warrant continued exploration of the interplay among the hope, relational support, and community support in affecting positive change. We mainly compared the model in which hope mediates between relational and community support and adjustment outcome with the model in which relational support and community support mediate between hope and adjustment outcome.

Tentatively, we expect hope to follow from the relational and community support because of the following reasons. Some social support researchers, drawing on the attachment theory, argue that the perception of support availability provides a secure foundation, if not a safety net, for youngsters to explore, experiment with, and participate in various kinds of life experiences, resulting in the development of self-confidence, essential life skills, and adaptive coping strategies (Sarason, Sarason, & Pierce, 1990). The social support model also highlights that social support is not

only tangible (or intangible) resources but includes health-sustaining and stress-reducing functions (Shumaker & Brownell, 1984). In particular, social support serves to satisfy people's affiliative needs and enhances self-esteem and confidence. Furthermore, the perceived support could facilitate individuals' interpretation of a potential stressor (cognitive appraisal), enabling a better coping strategy. Thus, according to these theories, one can reasonably expect that perceived support could not only ensure a solid foundation (self-esteem and confidence) but also resources (whether tangible or intangible) to further develop or to mitigate stress-related anxiety or behavior. Using the idea of hope, perceived support seems conducive to building an individual's hope (both agency and pathway dimensions), which subsequently leads to the positive adjustment.

H2: We hypothesize that the perceived ecological resources (relational support and community support) provide the foundation for personal hope, which results in positive adjustment.

Method

Participants and Procedures

Participants were youths in a 3-year Child Development Fund (CDF) project. To be eligible for the program, the participants have to receive Comprehensive Social Security Assistance or full grants for student finance schemes. Otherwise, they have a household income of <75% of the median monthly domestic household income in Hong Kong. Although most of the participants joined the program through the collaborating nongovernmental organization's open recruitment, some of them were referred by the operators' partner organization. This study was conducted in the summer of 2014 as a baseline measure, with the informed consent from all participants before their involvement in the program. A total of 834 participants were recruited through eight CDF operators, located in eight poor districts, whereas the government considers even six areas as the severely affected (out of a total of 18 districts in Hong Kong) based on a number of indicators (Commission on Poverty, 2013). Four participants were excluded from this study because of incorrect responses or missing data on age (e.g., 0 years old). The mean age of this sample was 14.25 years ($SD = 1.94$), and the age range was 11–18 years. Of this sample, 56% ($n = 467$) were female (1 = male and 2 = female), whereas 66.4% were living with both parents. About 28.7% ($n = 237$) were primary-school students, 48.8% ($n = 404$) were students in junior high school, while the rest (22.5%) were senior

secondary-school students. Approximately 92.2% ($n = 761$) were Hong Kong residents, whereas the remaining were immigrants. All participants completed a questionnaire survey and signed an informed consent before the survey. The survey was administered in Chinese to ensure questionnaire comprehension.

Measures

Relational support was measured by the Multidimensional Scale of Perceived Social Support (Zimet, Dahlem, Zimet, & Farley, 1988), which aims to measure three sources of relational support: family, friends, and significant other, respectively. The scale has been used locally (Cheng & Chan, 2004), and the Cronbach's alphas of the three subscales—family, peer, and significant other—were .93, .91, and .92.

Perceived community support was measured by a 10-item scale adapted from the Perceived Community Support Questionnaire (Herrero & Gracia, 2007). The scale was used in earlier research (Ng et al., 2014), and the factor structure is aligned with Herrero and Gracia's (2007) conceptualization. The first element (CI, community integration) included three items: An example is "I feel like my community is my own." The second factor (CP, community participation) consisted of three items: An example is "I take part in activities in my community." The third factor (CO, community organization) included four items: Examples are "I find the facilities in this community pertinent to my personal growth" and "I am accustomed to using the public facilities in this community." The Cronbach's alphas for the three subscales CI, CP, and CO were .92, .83, and .84, respectively.

Hope was measured by the six-item Children's Hope Scale (Snyder et al., 1997), tapping both the agency and pathway dimensions of hope. The Chinese version of the scale was translated and validated before (Ip, 2008; Tang, 2004). An example of the item in the agency dimension of hope includes "I think I am doing pretty well," while an example of the items in the pathway's dimension of hope is "When I have a problem, I can come up with lots of ways to solve it." The Cronbach's alphas for the Agency and Pathway subscales were .83 and .80, respectively.

Goal setting was a self-constructed measure, adapted from the two subscales (Career Planning and Goal Setting, respectively) of Yuen et al.'s (2005) Career Development Self-efficacy Inventory. The 7-item measure focuses on the adolescence goal planning, particularly related to career and future study. Examples of items are "I will assess and modify my career/study goal according to the change in external situation" and "I

will continuously improve my study and career plan to work toward my education/career goal.” The Cronbach’s alpha of the scale in the present study was .93.

Academic aspiration was measured by three questions: (a) “Over the past year, my grade improved,” (b) “I feel that studying is critical to me,” and (c) “I feel that studying is very meaningful to me.” The items were on a Likert scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). The reliability of this scale was .72.

Extracurricular activity was measured by the youths’ participation in eight types of structured voluntary activities (e.g., sports, personal interest, career related, cultural/arts, and religious), measured on a 4-point scale: *never*, *seldom*, *often*, and *always*. The aggregate score was used in subsequent analyses.

Economic worry was measured by the eight items on the Future Economic Worry Scale developed by Shek (2005). The participants will indicate their worry about the financial situation when they grow up, rated on a 4-point scale: *have no concern*, *have some worry*, *have considerable worry*, and *have much worry*. Examples of items are “I have to rely on welfare” and “Even if I have ability further my study, I would have financial difficulty.” The scale has demonstrated good internal consistency ($\alpha = .92$) in the present study.

Analysis

We used *Mplus* Version 7.2 (Muthén & Muthén, 1998–2014) to perform a structural equation modeling to examine our proposed models (see Figures 1 and 2). According to Anderson and Gerbing’s (1988) two-step approach, the measurement model was initially evaluated and then followed with the structural model, given that the measurement model reasonably fit the data. Age and gender were added as covariates to control their effects on the mediator and outcome variables. As the data were collected from eight CDF operators, they were nested, nonindependent observations in nature. We therefore defined the operator as a clustering value and set analysis as “Type = Complex” in *Mplus* to adjust standard errors to account for nested data, following Muthén and Muthén’s suggestion.

As some researchers (e.g., Bentler & Bonett, 1980; Jöreskog, 1969) have pointed out that chi-square is very sensitive to sample size, we used the following fit indices to evaluate the model fit: (a) comparative fit index (CFI $\geq .95$ = good fit; CFI = .90–.95 = reasonable fit; Bentler, 1990; Hu & Bentler, 1999) and (b) *p* is a close fit (Cfit $p \geq .05$; Browne & Cudeck, 1993), as well as the combination of (c) root mean square error of approximation

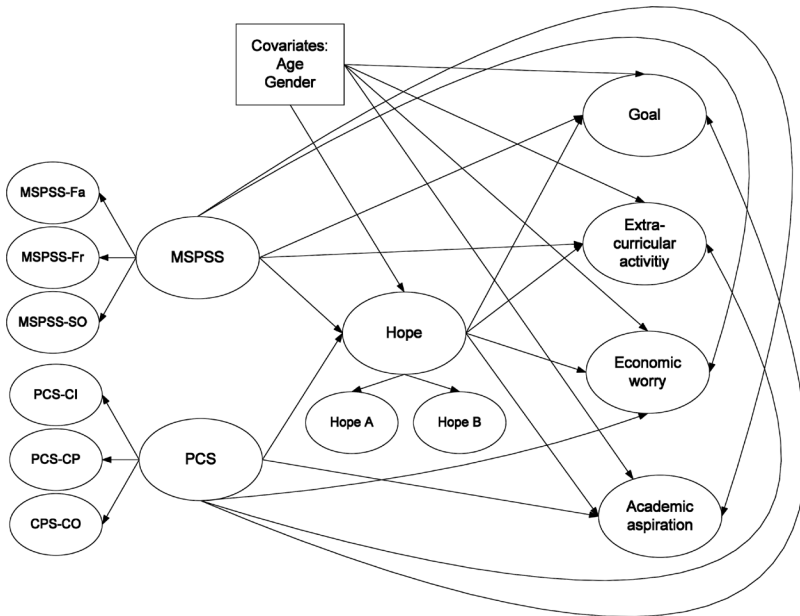


Figure 1. Proposed Model 1. MSPSS = multidimensional scale of perceived social support; MSPSS-Fa = perceived social support–family; MSPSS-Fr = perceived social support–friend; MSPSS-SO = perceived social support–significant other; PCS = perceived community support; PCS-CI = perceived community support–community integration; PCS-CP = perceived community support–community participation; PCS-CO = perceived community support–community organization; Hope A = Hope agency; Hope P = Hope pathway.

(RMSEA \leq .06; Hu & Bentler, 1999), its associated 90% confidence interval (CI; Browne & Cudeck, 1993), and (d) standardized root mean square residual (SRMR \leq .08; Hu & Bentler, 1999).

To compare the two proposed models, Bayesian information criterion (BIC) was used (Loehlin, 2004). The small BIC value suggests better models in terms of model fit and parsimony. According to Burnham and Anderson (2002), a BIC difference of 0–2 indicates evidence supporting the equivalency of the models. A BIC of 3–7 indicates that the less plausibly fitted model has considerably less support. A BIC of >10 is substantial evidence that the models are very unlikely the same.

The pattern of missing data was explored. Approximately 86% ($n = 714$) had complete data on all study variables, whereas ~10% ($n = 83$) had missing data for one variable. The rest of the participants had missing data

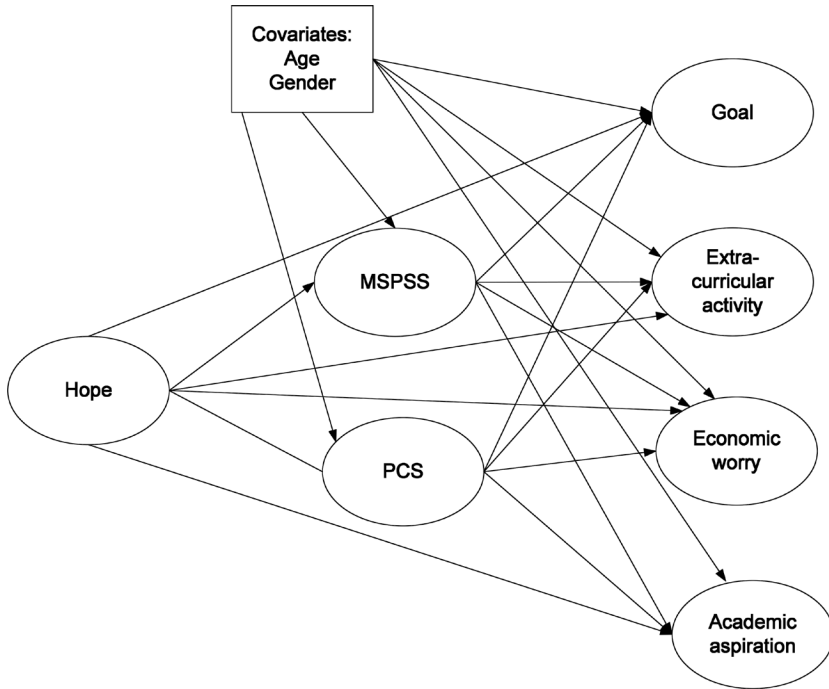


Figure 2. Proposed Model 2. MSPSS = multidimensional scale of perceived social support; PCS = perceived community support.

on two or more variables. To handle missing data, instead of using pairwise or listwise deletion, we used full information maximum likelihood (FIML) estimation, which produced relatively unbiased results (Enders, 2010).

Results

The means, standard deviations, and zero-order correlation among the variables are listed in Table 1. All intercorrelations were statistically significant. We also note that perceived social support and community support are also highly correlated with hope, whereas these variables are also significantly associated with the four outcome variables.

Measurement Model

We first performed a confirmatory factor analysis (CFA) on a model with seven latent variables: perceived social support, perceived community support, hope, academic aspiration, economic worry, extracurricular activity,

Table 1. Mean, standard deviation, and intercorrelations of study variables

	Mean (SD)	1	2	3	4	5	6	7
1. Age	14.25 (1.94)	1.00						
2. Perceived social support	62.29 (12.52)	-.11**	1.00					
3. Perceived community support	42.04 (8.11)	-.33**	.55**	1.00				
4. Hope	25.67 (4.25)	-.14**	.49**	.52**	1.00			
5. Academic aspiration	13.17 (2.72)	-.17**	.43**	.39**	.46**	1.00		
6. Economic worry	16.68 (5.63)	.15**	-.15**	-.13**	-.18**	-.09*	1.00	
7. Extracurricular activity	20.41 (4.41)	-.25**	.21**	.39**	.32**	.21**	-.13**	1.00
8. Goal setting	30.75 (5.21)	-.21**	.48**	.50**	.56**	.54**	-.14**	.29**

Note. Valid n lay between 782 and 830.

* $p < .05$.

** $p < .01$.

and goal setting. Results showed that the measurement model acceptably fit the data, $\chi^2(1,348, N = 830) = 3,005.385, p < .001$; RMSEA = .038 (90% CI [.037–.040]), Cfit $p = 1.00$; CFI = .918; SRMR = .055. The modification indices suggested correlating several pairs of item residuals. We evaluated those items and only allowed one pair of errors correlated. The items were from the Academic Aspiration scale (“I feel that studying is critical to me” and “I feel that studying is very meaningful to me”). We believed the adjustment was convincing because the correlations of these particular items were high ($r = .81$), and the paired items were highly similar to each other. After the adjustment, indices showed a better fit, $\chi^2(1,347, N = 830) = 2,909.937, p < .001$; RMSEA = .037 (90% CI [.036–.039]), Cfit $p = 1.00$; CFI = .923; SRMR = .047. Table 2 lists standardized factor loadings of the measurement model.

Structural Model

Model 1. The indices of Model 1 showed that it reasonably fit the data, BIC = 101,374.489, $\chi^2(1,445, N = 830) = 3,302.103, p < .001$; RMSEA = .039 (90% CI [.038–.041]), Cfit $p = 1.00$; CFI = .911; SRMR = .055. The

Table 2. Standardized factor loadings of measurement model

Factors	Items/First-order factor	Standardized factor loadings
MSPSS family	C13	.89
	C14	.91
	C18	.83
	C21	.86
MSPSS friends	C16	.82
	C17	.79
	C19	.88
	C22	.88
MSPSS significant other	C11	.83
	C12	.86
	C15	.88
	C20	.85
MSPSS	MSPSS family	.78
	MSPSS friends	.84
	MSPSS significant other	.96
Perceived community support–CI	C1	.87
	C2	.89
	C3	.92
	C4	.79
Perceived community support–CP	C5	.78
	C6	.73
	C7	.65
Perceived community support–CO	C8	.78
	C9	.84
	C10	.76
Perceived community support	PCS-CI	.84
	PCS-CP	.94
	PCS-CO	.90
Goal setting	E11	.78
	E12	.86
	E13	.82
	E14	.84
	E15	.80
	E16	.82
	E17	.77

Continued

Factors	Items/First-order factor	Standardized factor loadings
Extracurricular activity	G1	.66
	G2	.61
	G3	.50
	G4	.34
	G5	.53
	G6	.57
	G7	.41
	G8	.32
Hope agency	B7	.76
	B8	.82
	B9	.80
Hope pathway	B10	.79
	B11	.70
	B12	.78
Hope	Hope agency	.98
	Hope pathway	.95
Economic worry	H5	.70
	H6	.76
	H7	.73
	H8	.71
	H9	.82
	H10	.79
	H11	.79
	H12	.80
Academic aspiration	D3	.55
	D4	.52
	D5	.54

Note. The residuals of items D4 and D5 were correlated. MSPSS = multidimensional scale of perceived social support; PCS-CI = perceived community support–community integration; PCS-CO = perceived community support–community organization; PCS-CP = perceived community support–community participation. All factor loadings were statistically significant ($p < .001$).

unstandardized and standardized parameter estimates are presented in Table 3. Regarding the covariates, age positively predicted economic worry ($\beta = .15$, $p < .001$) but negatively predicted extracurricular activity ($\beta = -.15$, $p < .05$) and academic aspiration ($\beta = -.17$, $p < .05$). However, the age effects related to hope and goal setting were not statistically significant. On the other hand, gender was negatively associated with hope ($\beta = -.06$, $p < .05$). However, the gender effects were not significant as related to other outcome variables.

Table 3. Unstandardized and standardized coefficients of direct effects of Model 1

	Unstandardized coefficient	Standardized coefficient
1. Direct effects on hope		
Perceived social support → Hope	.22***	.29***
Perceived community support → Hope	.39***	.42***
Age → Hope	-.00	-.01
Gender → Hope	-.08*	-.06*
2. Direct effects on goal setting		
Perceived social support → Goal setting	.16*	.19**
Perceived community support → Goal setting	.18***	.18***
Hope → Goal setting	.45***	.42***
Age → Goal setting	-.03	-.06
Gender → Goal setting	.02	.01
3. Direct effects on extracurricular activity		
Perceived social support → Extracurricular activity	-.04	-.07
Perceived community support → Extracurricular activity	.26***	.35***
Hope → Extracurricular activity	.21***	.26***
Age → Extracurricular activity	-.04*	-.15*
Gender → Extracurricular activity	-.01	-.01
4. Direct effects on economic worry		
Perceived social support → Economic worry	-.09	-.14
Perceived community support → Economic worry	.07	.08
Hope → Economic worry	-.14**	-.16***
Age → Economic worry	.04***	.15***
Gender → Economic worry	.01	.01
5. Direct effects on academic aspiration		
Perceived social support → Academic aspiration	.19***	.25***
Perceived community support → Academic aspiration	.15*	.16*
Hope → Academic aspiration	.52***	.51***
Age → Academic aspiration	-.06*	-.17*
Gender → Academic aspiration	.08	.07

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

After controlling for age and gender effects, perceived social support was positively and significantly predicted hope ($\beta = .29, p < .001$), goal setting ($\beta = .19, p < .01$), and academic aspiration ($\beta = .25, p < .001$). However, the paths from perceived social support to extracurricular activity and economic worry were not significant. On the other hand, perceived community support positively predicted hope ($\beta = .42, p < .001$), goal setting ($\beta = .18, p < .001$), extracurricular activity ($\beta = .35, p < .001$), and academic aspiration ($\beta = .16, p < .05$). However, no associations were found for perceived community support to economic worry. Hope was positively associated with goal setting ($\beta = .42, p < .001$), extracurricular activity ($\beta = .26, p < .001$), and academic aspiration ($\beta = .51, p < .001$), but negatively associated with economic worry ($\beta = -.16, p < .001$).

Table 4 lists the indirect effects of the model. All indirect pathways were significant, indicating that hope was a powerful mediator between the predictors and outcomes. Particularly, hope fully mediated the negative relationships between perceived social support and economic worry

Table 4. Unstandardized and standardized coefficients of indirect effects of Model 1

Paths	Unstandardized coefficient	Standardized coefficient
1. Perceived social support → Hope → Goal setting	.10*	.12*
2. Perceived community support → Hope → Goal setting	.18***	.19**
3. Perceived social support → Hope → Extracurricular activity	.05*	.08*
4. Perceived community support → Hope → Extracurricular activity	.08***	.11***
5. Perceived social support → Hope → Economic worry	-.03*	-.05**
6. Perceived community support → Hope → Economic worry	-.05**	-.07***
7. Perceived social support → Hope → Academic aspiration	-.11**	.15**
8. Perceived community support → Hope → Academic aspiration	.20***	.22***

* $p < .05$.

** $p < .01$.

*** $p < .001$.

($\beta = -.05, p < .01$), and those between perceived social support and extracurricular activity ($\beta = .08, p < .05$). Comparatively, hope fully mediated the negative relationships between perceived community support and economy worry ($\beta = .07, p < .001$). Furthermore, hope partially mediated the positive relationships between perceived social support and goal setting ($\beta = .12, p < .05$), and those between perceived community support and goal setting ($\beta = .19, p < .001$). Hope also partially mediated the positive relationships between perceived social support and academic aspiration ($\beta = .15, p < .01$), community support and academic aspiration ($\beta = .22, p < .001$) and perceived community support and extracurricular activity ($\beta = .11, p < .001$).

Model 2. To further investigate the interplay between relational support, perceived community support, and hope in affecting positive adjustment, we tested an alternative model in which we consider perceived social support and community support as the mediator between hope and adjustment outcome. The indices of Model 2 also suggested that the model reasonably fit the data, $BIC = 101,384.495$, $\chi^2(1,444, N = 830) = 3,289.275$, $p < .001$; $RMSEA = .039$ (90% CI [.034–.041]), $Cfit\ p = 1.00$; $CFI = .912$; $SRMR = .067$. The unstandardized and standardized direct and indirect effects of the model are presented Tables 5 and 6, respectively. In summary, regarding the covariates, age negatively predicted perceived community support ($\beta = -.29, p < .001$), extracurricular activity ($\beta = -.13, p < .05$), and academic aspiration ($\beta = -.18, p < .01$). In contrast, age positively predicted economic worry ($\beta = .16, p < .001$). However, age had no significant effect on perceived social support and goal setting. Gender had no significant effect on any outcome variables, except for perceived social support ($\beta = .14, p < .001$). Regarding the direct effects, the two models are comparable. However, the paths from perceived social support to extracurricular activity and economic worry were not significant. No associations were also found with perceived community support to economic worry. As a result, the indirect effects of (a) hope \rightarrow perceived social support \rightarrow extracurricular activity, and (b) hope \rightarrow perceived social support \rightarrow economy worry were not significant. Also, the indirect effects of hope \rightarrow perceived community support \rightarrow economy worry was not significantly remarkable.

Model 1 Versus Model 2. By comparing the BIC values between the two models, Model 1 ($BIC = 101,374.49$) had a lower value than did Model 2 ($BIC = 101,384.50$). The difference ($\Delta BIC = 10.01$) was substantial, indicating the superiority of Model 1 over Model 2. Thus, Model 1 was deemed the better model.

Table 5. Unstandardized and standardized coefficients of direct effects of Model 2

	Unstandardized coefficient	Standardized coefficient
1. Direct effects to perceived social support		
Hope → Perceived social support	.75***	.56***
Age → Perceived social support	-.01	-.02
Gender → Perceived social support	.23***	.14***
2. Direct effects to perceived community support		
Hope → Perceived community support	.63***	.59***
Age → Perceived community support	-.10***	-.29***
Gender → Perceived community support	.02	.02
3. Direct effects to goal setting		
Perceived social support → Goal setting	.15*	.18*
Perceived community support → Goal setting	.17***	.17***
Hope → Goal setting	.48***	.43***
Age → Goal setting	-.02	-.07
Gender → Goal setting	.01	.01
4. Direct effects to extracurricular activity		
Perceived social support → Extracurricular activity	-.03	-.05
Perceived community support → Extracurricular activity	.25***	.33***
Hope → Extracurricular activity	.21***	.26***
Age → Extracurricular activity	-.03*	-.13*
Gender → Extracurricular activity	-.01	-.01
5. Direct effects to economic worry		
Perceived social support → Economic worry	-.08	-.12
Perceived community support → Economic worry	.07	.08
Hope → Economic worry	-.14**	-.16***
Age → Economic worry	.05***	.16***
Gender → Economic worry	.01	.01
6. Direct effects to academic aspiration		
Perceived social support → Academic aspiration	.18***	.23**
Perceived community support → Academic aspiration	.14*	.15*
Hope → Academic aspiration	.55***	.53***
Age → Academic aspiration	-.06**	-.18**
Gender → Academic aspiration	.08	.07

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

Table 6. Unstandardized and standardized coefficients of indirect effects of Model 2

Paths	Unstandardized coefficient	Standardized coefficient
1a. Hope → Perceived social support → Goal setting	.11**	.10**
1b. Hope → Perceived community support → Goal setting	.11***	.10***
Total indirect effects	.22***	.20***
2a. Hope → Perceived social support → Extracurricular activity	-.02	-.03
2b. Hope → Perceived community support → Extracurricular activity	.16***	.20***
Total indirect effects	.13**	.17**
3a. Hope → Perceived social support → Economic worry	-.06	-.07
3b. Hope → Perceived community support → Economic worry	.04	.05
Total indirect effects	-.02	-.02
4a. Hope → Perceived social support → Academic aspiration	.13**	.13**
4b. Hope → Perceived community support → Academic aspiration	.09*	.09*
Total indirect effects	.22***	.21***

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

Discussion

The present study furthers our understanding of the positive adjustment of low-income youths in five major ways:

First, this study provides evidence that hope and relational support, as well as community support, are valuable assets for promoting positive adjustment and protective factors for mitigating negative influence under the shadow of poverty. Both hope and external support (including relational and community support) are not only conducive to positive adaptation (such as goal setting, academic aspiration and extracurricular activity) but can also mitigate the negative thoughts (e.g., economic worry) that may inhibit the development of low-income youths. Even though the idea that

both the personal attributes and external support are crucial in the positive adjustment process is not new (as reported by Lerner, Lerner, von Eye, Bowers, & Lewin-Bizan, 2011; Masten, 2001; Scales et al., 2004; and Shonkoff & Phillips, 2000), the findings of this study are particularly informative for understanding the extent of these effects on specific adjustment variables and how this understanding applies to low-income children and youths in a Chinese context in which this study was undertaken.

Second, this study provides initial evidence on the development of adolescents' hope. In fact, "what derives hope" is a research issue seldom investigated by researchers. Snyder (2002), when discussing the development of hope, argued that having caregivers who are sensitive to one's needs not only helps children develop a sense of control but also models the ways to solve immediate problems. Nevertheless, as the idea of attachment primarily focuses on the infant or toddler stage, what other factors could contribute to hope in the youth stage has rarely been investigated. This study appears to support the idea that hope does not develop in a vacuum. Instead, an environment with relational or community support is the fertile environment for developing hope.

Third, this study provides insights into the mechanism promoting positive adjustment, particularly about the interplay between individual attributes and external support (including both relational and community support) in predicting youths' psychosocial adjustment. In particular, that the findings support Model 1 (instead of Model 2) may imply that relational support and community support (as compared to hope) are more the driving forces, facilitating the psychosocial adjustment of low-income Chinese youths. Both relational support and community support not only appear to facilitate positive adjustment directly but also may induce hope, which further augments the contribution to a positive adaptation. It may be related to the demographics (whose context is disadvantaged) or the cultural background (whose nature is more interdependent) of the participants, which need further investigation. Nevertheless, hope's significant mediating effect between external support and adjustment also supports Schmid et al.'s (2011) idea that hope is a key individual strength essential to positive youth development. Despite drawing on the correlational data, this study strengthens the validity of the effect of both individual characteristics and external resources on positive youth development (Lerner et al., 2011) and supports the ecological approach to youth services, with a dual emphasis on enhancing both internal, as well as external, resources.

Fourth, this study demonstrates that having relational and community support, mediated via hope, strongly predicts several key psychosocial adjustment variables. The proposed mechanism applies not only to the

development of low-income youths' goal setting, academic aspirations, and participation in extracurricular activity, but also to the mitigation of their economic worry about the future. There are, however, subtle differences in the underlying mechanism between the external support and specific psychosocial adjustment variables. In particular, both relational support and community support directly relate to goal setting and are indirectly associated through hope. In view of the call for more studies on understanding how adolescents' purpose is developed (Kashdan & McKnight, 2009; Koshy & Mariano, 2011), our findings suggest that having both relational support and community support, mediated via hope, is the facilitating mechanism toward youths' goal and purpose development.

Regarding academic aspirations, while both the perceived social support and community support are also associated directly and indirectly through hope, the direct effect of perceived social support on academic aspiration is evident as compared to community support, whose association is more likely mediated by hope. In contrast, participation in extracurricular activity is associated with community support both directly and indirectly, whereas the association with perceived social support is mediated entirely by hope. In other words, whereas the social support in the immediate circle may play a significant role in academic aspirations (maybe through tutoring or collaborative learning), community support seems to be salient in adolescents' participation in extracurricular activity.

Regarding economic worry, the association with relational or community support is entirely mediated by hope, reflecting the undeniable, despite indirect, effect. It may also reflect that youths' worry about the future must be handled with care because providing external support does not necessarily translate into less worry. Instead, worry about the future could be mediated through hope, maybe through some private sharing, discussion, and support.

Thus, these findings provide valuable insight and evidence for understanding the context in which the particular psychosocial adjustment variables could be nurtured. While the relational and community support may have varied importance regarding different adjustment outcomes, the study findings appear to suggest a mechanism that could not only enhance positive development but also buffer the adverse effects, lending support to positive adaptation. Certainly, more evidence is needed.

Fifth, it should be noted that, in this study, age positively and significantly predicts economic worry and negatively predicts extracurricular activity and academic aspiration. Furthermore, age is negatively associated with hope, relational support, community support, and goal setting. In other words, as compared to early adolescents, older adolescents from a

low-income background worry more about the future. Additionally, unfortunately, they have fewer assets, whether internal assets (such as hope) or external assets (such as relational support or chances for extracurricular activity), for facing the life challenges ahead. Not only are the findings consistent with Scales et al.'s (2011) argument that, as compared to their younger counterparts, youths experience less developmental support, the findings may also depict the harsh reality facing low-income adolescents that youth is not necessarily rosy, awaiting various opportunities. Instead, life may be accompanied by continual worry about the future with fewer resources and support. Nevertheless, this study appears to provide a glimpse of hope regarding what can be done to address the situation.

Limitation and Future Research

This study had several limitations that warrant further improvement. First, correlational data limit the claim about causality, even though comparing the alternative mediation model can provide stronger evidence. A longitudinal study would be better in further confirming various types of association shown in this study. Second, as this study targeted children from low incomes, whether the result represents the general population has yet to be verified. Third, assessments of youths' positive adjustment were based solely on the adolescents' self-report and perceptions, which may easily lead to bias. Including objective data (such as school or nongovernmental organization records) or other stakeholders' (such as parents or schoolteachers) perspective would be useful. Fourth, related to this, although the presence of support resources is generally understood to lead to a perceived level of support (Barrera, 2000), perceived relational or community support may not actually reflect the availability and accessibility of these external resources. Thus, examining in greater detail the relational and community context in which youths are embedded would be helpful. Data from objective/secondary data (such as government reports) may be solicited in a future investigation. Fifth, other potential mediators of the association between the support and outcomes can be further examined. For example, Cutrona et al.'s (1994) finding appeared to suggest that interpersonal anxiety and high academic self-efficacy mediate the relation between parental social support and academic performance. Whether these factors apply to other adjustment outcomes (like our study findings) awaits scholarly effort. Last but not least, some may argue that unrealistic hope may obstruct, rather than facilitate, positive development and adjustment. Likewise, others may also argue that economic worry is not a positive adjustment outcome or even wonder whether it is more adaptive for those living in poverty or with

low income. Thus, longitudinal follow-up of whether there will be a “dark side” of hope or positive side of economic worry is worth investigation.

Despite the limitation, this study has several unique contributions. First, the findings suggest a refined model of how the positive adjustment of low-income youths could be promoted. In particular, increasing hope (individual strength), relational support, and community support (external resource) is a promising area should the intervention be effective. Our findings support the provision of ecological youth services for the active adjustment of children, particularly for those from a low-income background. Also, the understanding aligns with some recent youth-related advocacy work on strengthening developmental relationships and developmental communities (Search Institute, 2015).

Second, our findings further our understanding of the mechanism underlying the relationship between the external support and positive adaptation pertaining to the critical role of hope. This further corroborates the evidence from previous studies (whether neuroscience and psychology) that adolescents are sensitive regarding the impact of their social environment, as the availability of external support may affect adolescents’ perception of hope, which critically determines their positive adjustment. Lazarus (1999) is right to point out that “without hope, we are not likely to act on our own behalf” (p. 666). Nevertheless, hope is not developed in a vacuum, but in an environment with relational and community support. Our findings provide initial evidence for such a position.

Third, our study findings provide a delicate understanding of the various ways in which several key psychosocial adjustment variables could be promoted or nurtured. In particular, relational support and community support are directly related to goal pursuit and indirectly associated through hope. In contrast, the association between external (i.e., relational and community) support and economic concern is mediated entirely through hope. Also, although social support by peers or the immediate family circle appears to play a salient role in promoting academic aspirations, community support has a more positive association with adolescents’ participation in extracurricular activities. The understanding of the various pathways regarding specific adjustment variables enriches our knowledge of the appropriate ways to promote individual adjustment outcomes. For example, providing support in a more proximal environment and relational context may be a better way to improve academic functioning and achievement but not that useful for promoting participation in extracurricular activities. Furthermore, to lessen low-income youths’ economic worry about the future, we must provide more tender care (to induce hope), in addition to merely providing external support.

In conclusion, our study findings provide strong evidence that offering relational and community support, with a hopeful attitude, is a likely mechanism for promoting positive adjustment, measured by goal setting, academic aspiration, extracurricular activity participation, and less economic worry about the future. Not only could relational and community support directly facilitate positive psychosocial adjustment, it may also induce hope, which further augments positive adjustment. In the study of a mutual help group, Roberts et al. (1999) found that supported participants functioned better only when members experienced stronger group integration, suggesting that help is most beneficial in the context of a caring social community. Our study results appear to echo their finding that complementing relational support with community support is the better strategy to promote positive adjustment. Furthermore, our study extends and substantiates Roberts et al.'s (1999) idea that the reason why it is most beneficial in the context of relational and community support is because it could induce hope, which induces positive psychosocial adjustment.

References

- Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*, *103*(3), 411–423. doi:10.1037/0033-2909.103.3.411
- Barrera, M. (2000). Social support research in community psychology. In J. Rappaport & E. Seidman (Eds.), *Handbook of community psychology* (pp. 215–245). New York: Kluwer Academic/Plenum.
- Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin*, *107*(2), 238–246. doi:10.1037/0033-2909.107.2.238
- Bentler, P. M., & Bonett, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin*, *88*(3), 588–606. doi:10.1037/0033-2909.88.3.588
- Blomfield, C. J., & Barber, B. L. (2011). Developmental experiences during extracurricular activities and Australian adolescents' self-concept: Particularly important for youth from disadvantaged schools. *Journal of Youth and Adolescence*, *40*(5), 582–594. doi:10.1007/s10964-010-9563-0
- Bohnert, A. M., Martin, N. C., & Garber, J. (2007). Predicting adolescents' organized activity involvement: The role of maternal depression history, family relationship quality, and adolescent cognitions. *Journal of Research on Adolescence*, *17*(1), 221–244. doi:10.1111/j.1532-7795.2007.00520.x
- Borowsky, I. W., Ireland, M., & Resnick, M. D. (2009). Health status and behavioral outcomes for youth who anticipate a high likelihood of early death. *Pediatrics*, *124*(1), e81–e88. doi:10.1542/peds.2008-3425.

- Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models* (pp. 136–162). Newbury, CA: Sage.
- Burnham, K. P., & Anderson, D. R. (2002). *Model selection and multimodel inference: A practical information-theoretic approach* (2nd ed.). New York: Springer.
- Burrow, A. L., O'Dell, A. C., & Hill, P. L. (2010). Profiles of a developmental asset: youth purpose as a context for hope and well-being. *Journal of Youth and Adolescence, 39*(11), 1265–1273. doi:10.1007/s10964-009-9481-1
- Carroll, A., Durkin, K., Hattie, J., & Houghton, S. (1997). Goal setting among adolescents: A comparison of delinquent, at-risk, and not-at-risk youth. *Journal of Educational Psychology, 89*(3), 441–450. doi:10.1037/0022-0663.89.3.441
- Cheng, S.-T., & Chan, A. C. M. (2004). The multidimensional scale of perceived social support: Dimensionality and age and gender differences in adolescents. *Personality and Individual Differences, 37*(7), 1359–1369. doi:10.1016/j.paid.2004.01.006
- Commission on Poverty. (2013). *The first meeting of Societal Engagement Task Force—Illustrating the poverty situation by district based on a basket of indicators* [in Chinese]. Hong Kong: Commission on Poverty. Retrieved from http://www.povertyrelief.gov.hk/pdf/20130225_3-2013.pdf
- Coughlin, S. S. (2006). Hope, ethics, and public health. *Journal of Epidemiology & Community Health, 60*(10), 826–827. doi:10.1136/jech.2006.047431
- Cutrona, C. E., Cole, V., Colangelo, N., Assouline, S. G., & Russell, D. W. (1994). Perceived parental social support and academic achievement: An attachment theory perspective. *Journal of Personality and Social Psychology, 66*(2), 369–378. doi:10.1037/0022-3514.66.2.369
- Damon, W., Menon, J., & Cotton Bronk, K. (2003). The development of purpose during adolescence. *Applied Developmental Science, 7*(3), 119–128. doi:10.1207/S1532480XADS0703_2
- Enders, C. K. (2010). *Applied missing data analysis*. New York: Guilford Press.
- Herrero, J., & Gracia, E. (2007). Measuring perceived community support: Factorial structure, longitudinal invariance, and predictive validity of the PCSQ (Perceived Community Support Questionnaire). *Journal of Community Psychology, 35*(2), 197–217. doi:10.1002/jcop.20143
- Hong Kong Confederation of Trade Unions. (2015). *HKCTU campaign for standard working hours*. Hong Kong: HKCTU. Retrieved from http://www.hkctu.org.hk/cms/article.jsp?article_id=1029&cat_id=38
- Hu, L.-t., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*(1), 1–55.
- Huston, A. C., & Bentley, A. C. (2010). Human development in social context. *Annual Review of Psychology, 61*, 413–437. doi:10.1080/10705519909540118

- Ip, Y. T. (2008). *The role of positive emotions in hope theory: An experimental study* (Unpublished master's thesis). University of Hong Kong, Hong Kong.
- Jöreskog, K. (1969). A general approach to confirmatory maximum likelihood factor analysis. *Psychometrika*, *34*(2), 183–202. doi:10.1002/j.2333-8504
- Labour Department. (2012). *Report of the policy study on standard working hours*. Hong Kong: Hong Kong Special Administrative Region (HKSAR).
- Larson, R. W. (2000). Toward a psychology of positive youth development. *American Psychologist*, *55*(1), 170–183. doi:10.1037/0003-066X.55.170
- Lazarus, R. S. (1999). Hope: An emotion and a vital coping resource against despair. *Social Research*, *66*(2), 653–678.
- Lerner, R. M., Lerner, J. V., von Eye, A., Bowers, E. P., & Lewin-Bizan, S. (2011). Individual and contextual bases of thriving in adolescence: A view of the issues. *Journal of Adolescence*, *34*(6), 1107–1114. doi:10.1016/j.adolescence.2011.08.001
- Leventhal, T., & Brooks-Gunn, J. (2000). The neighborhoods they live in: The effects of neighborhood residence on child and adolescent outcomes. *Psychological Bulletin*, *126*(2), 309–337. doi:10.1037/0033-2909.126.2.309
- Li, J., & Julian, M. M. (2012). Developmental relationships as the active ingredient: A unifying working hypothesis of “what works” across intervention settings. *American Journal of Orthopsychiatry*, *82*(2), 157–166. doi:10.1111/j.1939-0025.2012.01151.x
- Loehlin, J. C. (2004). *Latent variable models: An introduction to factor, path, and structural equation analysis* (4th ed.). Hillsdale, NJ: Erlbaum.
- Masten, A. S. (2001). Ordinary magic: Resilience processes in development. *American Psychologist*, *56*(e), 227–238. doi:10.1037/0003-066X.56.3.227
- Masten, A. S., Roisman, G. I., Long, J. D., Burt, K. B., Obradovic, J., Riley, J. R., . . . Tellegen, A. (2005). Developmental cascades: Linking academic achievement and externalizing and internalizing symptoms over 20 years. *Developmental Psychology*, *41*(5), 733–746. doi:10.1037/0012-1649.41.5.733
- Muthén, L. K., & Muthén, B. O. (1998–2014). *Mplus user's guide* (7th ed.). Los Angeles: Muthén & Muthén.
- Ng, E. C. W., & Chan, C. C. (2017). *Mentors' impact on underprivileged youths' life goal and purpose in Hong Kong*. Manuscript under review.
- Ng, E. C. W., Chan, C. C., & Lai, M. K. (2014). Hope and life satisfaction among underprivileged children in Hong Kong: The mediating role of perceived community support. *Journal of Community Psychology*, *42*(3), 352–364. doi:10.1002/jcop.21614
- Nowell, B., & Boyd, N. (2010). Viewing community as responsibility as well as resource: Deconstructing the theoretical roots of psychological sense of community. *Journal of Community Psychology*, *38*(7), 828–841. doi:10.1002/jcop.20398

- Oettingen, G., Pak, H., & Schnetter, K. (2001). Self-regulation of goal setting: Turning free fantasies about the future into binding goals. *Journal of Personality and Social Psychology, 80*(5), 736–753. doi:10.1037/0022-3514.80.5.736
- Roberts, L. J., Salem, D., Rappaport, J., Toro, P. A., Luke, D. A., & Seidman, E. (1999). Giving and receiving help: Interpersonal transactions in mutual-help meetings and psychosocial adjustment of members. *American Journal of Community Psychology, 27*(6), 841–868. doi:10.1023/A:1022214710054
- Sarason, B. R., Sarason, I. G., & Pierce, G. R. (1990). *Social support: An interactional view*. New York: Wiley.
- Scales, P. C., Benson, P. L., Bartig, K., Streit, K., Moore, K. A., Lippman, L., . . . Theokas, C. (2006). *Keeping America's promises to children and youth: A Search Institute–Child Trends report on the results of the America's Promise national telephone polls of children, teenagers, and parents*. Washington, DC: Search Institute & Child Trends.
- Scales, P. C., Benson, P. L., & Roehlkepartain, E. C. (2011). Adolescent thriving: The role of sparks, relationships, and empowerment. *Journal of Youth and Adolescence, 40*(3), 263–277. doi:10.1007/s10964-010-9578-6
- Scales, P. C., Leffert, N., & Lerner, R. M. (2004). *Developmental assets: A synthesis of the scientific research on adolescent development*. Minneapolis, MN: Search Institute.
- Schmid, K. L., Phelps, E., Kiely, M. K., Napolitano, C. M., Boyd, M. J., & Lerner, R. M. (2011). The role of adolescents' hopeful futures in predicting positive and negative developmental trajectories: Findings from the 4-H Study of Positive Youth Development. *Journal of Positive Psychology, 6*(1), 45–56. doi:10.1080/17439760.2010.536777
- Search Institute. (2015). *Developmental relationships: A new strategy for Search Institute and a new emphasis for youth development and education*. Minneapolis, MN: Search Institute. Retrieved from <http://www.search-institute.org/research/developmental-relationships>
- Shah, A. K., Mullainathan, S., & Shafir, E. (2012). Some consequences of having too little. *Science, 338*(6107), 682–685. doi:10.1126/science.1222426
- Shek, D. T. L. (2005). Economic stress, emotional quality of life, and problem behavior in Chinese adolescents with and without economic disadvantage. In D. T. L. Shek, Y. K. Chan, & P. S. N. Lee (Eds.), *Quality-of-life research in Chinese, Western and global contexts* (pp. 363–383). Dordrecht, Netherlands: Springer.
- Shonkoff, J. P., & Phillips, D. (2000). *From neurons to neighborhoods: The science of early child development*. Washington, DC: National Academy Press.
- Shumaker, S. A., & Brownell, A. (1984). Toward a theory of social support: Closing conceptual gaps. *Journal of Social Issues, 40*(4), 11–36. doi:10.1111/j.1540-4560.1984.tb01105.x

- Snyder, C. R. (1994). *The psychology of hope: You can get there from here*. New York: Free Press.
- Snyder, C. R. (2002). Hope theory: Rainbows in the mind. *Psychological Inquiry*, 13(4), 249–275. doi:10.1207/S15327965PLI1304_01
- Snyder, C. R., Hoza, B., Pelham, W. E., Rapoff, M., Ware, L., Danovsky, M., . . . Stabl, K. J. (1997). The development and validation of the Children's Hope Scale. *Journal of Pediatric Psychology*, 22(3), 399–421. doi:10.1093/jpepsy/22.3.399
- Snyder, C. R., & Lopez, S. J. (2002). *Handbook of positive psychology*. New York: Oxford University Press.
- Snyder, C. R., Shorey, H. S., Cheavens, J., Pulvers, K. M., Adams III, V. H., & Wiklund, C. (2002). Hope and academic success in college. *Journal of Educational Psychology*, 94(4), 820–826. doi:10.1037/0022-0663.94.4.820
- Sterrett, E. M., Jones, D. J., McKee, L. G., & Kincaid, C. (2011). Supportive non-parental adults and adolescent psychosocial functioning: Using social support as a theoretical framework. *American Journal of Community Psychology*, 48(3–4), 284–295. doi:10.1007/s10464-011-9429-y
- Stoddard, S. A., McMorris, B. J., & Sieving, R. E. (2011). Do social connections and hope matter in predicting early adolescent violence? *American Journal of Community Psychology*, 48(3–4), 247–256. doi:10.1007/s10464-010-9387-9
- Tang, S. H. (2004). *Raising hope--Another aspect to approach affective education*. Paper presented at the 2004 Annual Conference of Chinese Guidance Association. (Readers who want to access this source should contact the original author.)
- Thompson, R. (2014). Why are relationships important to children's well-being? In A. Ben-Arieh, F. Casas, I. Frønes, & J. E. Korbin (Eds.), *Handbook of child well-being: Theories, methods and policies in global perspective* (pp. 1917–1954). Dordrecht, Netherlands: Springer.
- Tsang, S. K. M., & Chu, Y. K. (2010). Social cohesive efforts to meet youth development needs in Tin Shui Wai, Hong Kong. In K.-H. Mok & Y.-w. Ku (Eds.), *Social cohesion in greater China: Challenges for social policy and governance* (pp. 43–68). Singapore: World Scientific.
- Whittaker, J. K., Schinke, S. P., & Gilchrist, L. D. (1986). The ecological paradigm in child, youth and family services: Implications for policy and practice. *Social Science Review*, 60(4), 483–503.
- Wong, H. (2000). The cause for poverty in 1990s Hong Kong: Micro, macro and meso analysis. In H. T. K. Mok (Ed.), *Poverty and social development* (pp. 3–30). Hong Kong: Hong Kong Social Security Society and Asia Monitor Resource Center.

-
- Yuen, M., Gysbers, N., Chan, R. C., Lau, P. Y., Leung, T. M., Hui, E. P., & Shea, P. K. (2005). Developing a career development self-efficacy instrument for Chinese adolescents in Hong Kong. *International Journal for Educational and Vocational Guidance*, 5(1), 57–73. doi:10.1007/s10775-005-2126-3
- Zimet, G. D., Dahlem, N. W., Zimet, S. G., & Farley, G. K. (1988). The multidimensional scale of perceived social support. *Journal of Personality Assessment*, 52(1), 30–41. doi:10.1207/s15327752jpa5201_2

Children's Recall of Storybook Events: Links With Attachment and Gender

Tia Panfile Murphy, Brianna Jehl, Kayla Hamel,
Kelsey McCurdy, and Allison Halt *Washington College*

The quality of the attachment bond between a child and a caregiver can have lasting effects on how the child perceives, interprets, and recalls events through the filtering of internal working models. Previous research has shown that secure children tend to recall emotional information better than insecure children. The current study examined the association between attachment and children's recall with a sample of 81 children between the ages of 54 and 63 months. Mothers completed the Attachment Q-Set, and the researcher read a storybook with an emotional theme to the children. Children's memory for the storybook details was assessed. Results indicated that, even after controlling for age, more-secure children were better able to recall more details overall. Girls also performed slightly better than boys, although this finding was marginally significant. Overall, the current findings suggest that less-secure children may have defensive processes that prevent them from remembering details from an emotion-laden storybook, which has developmental and educational implications.

Tia Panfile Murphy, Brianna Jehl, Kayla Hamel, Kelsey McCurdy, and Allison Halt, Department of Psychology.

Brianna Jehl is now at the Eliot-Pearson Department of Child Study and Human Development, Tufts University; Kayla Hamel is now at the School of Social Work, University of Maryland–Baltimore; Kelsey McCurdy is now at the Department of Counseling, Higher Education, and Special Education, University of Maryland; and Allison Halt is now at the Interdisciplinary Neuroscience Program, University of Missouri–Columbia.

We would like to thank the children and parents who generously dedicated their time and effort to participate in this study, and the many undergraduate students at Washington College who assisted with the project.

Address correspondence to Tia Panfile Murphy, Department of Psychology, Washington College, 300 Washington Avenue, Chestertown, MD 21620. Phone: (410) 810-7476. Fax: (410) 778-7275. E-mail: tmurphy2@washcoll.edu.

Merrill-Palmer Quarterly, October 2017, Vol. 63, No. 4, pp. 543–560. doi: 10.13110/merrpalmquar1982.63.4.0543 Copyright © 2018 by Wayne State University Press, Detroit, MI 48201.

Attachment theorists have long believed that the quality of the attachment formed between a child and a caregiver can influence how the child comes to interact with and view the world (Bowlby, 1969/1982; Bretherton & Munholland, 2008). Based on their interactions with a sensitive or insensitive caregiver, children come to expect similar behaviors from others, and this can bias their perception and interpretation of social events, as well as influence their behavior within social experiences (Bretherton & Munholland, 2008). Although previous research testing this notion has discovered that attachment can impact how adults attend to, perceive, and recall an event, limited work has tested this theory with children (e.g., for reviews, see Alexander, Quas, & Goodman, 2002; Dykas & Cassidy, 2011). The current study attempted to add to the knowledge about how attachment is associated with children's cognitive processing by looking specifically at recalling details from an emotional storybook. Additionally, because girls have sometimes displayed better recall than boys (e.g., Temple & Cornish, 1993), it was also deemed important to consider gender differences and whether attachment interacts with gender in a meaningful way to predict recollection.

Attachment and Memory

Children form an attachment, or an enduring emotional bond, with a caregiver early in life to ensure their survival (Bowlby, 1969/1982). Based on their early interactions with caregivers, children create internal working models or cognitive representations of the self and others within the context of relationships (Bretherton & Munholland, 2008). Children who consistently experience sensitive caregiving when in distress become securely attached and view the self as valuable, others as dependable, and relationships as worthwhile (Ainsworth, Blehar, Waters, & Wall, 1978; Bretherton & Munholland, 2008). Other children, who are responded to inconsistently or are rejected in times of distress, form an insecure attachment to the caregiver (ambivalent and avoidant, respectively) (Ainsworth et al., 1978; Bowlby, 1988). These children form negative internal working models and are more likely to view the self as unworthy of love and attention, as well as have difficulty trusting others and relationships (Bowlby, 1969/1982; Bretherton & Munholland, 2008). Internal working models are formed within the first few years of life and are believed to act as cognitive filters to bias individuals' attention to, perceptions of, and recollection of events and to predict the behavior of the self and others in social contexts (Dykas & Cassidy, 2011; Bretherton & Munholland, 2008).

The bulk of the available research examining attachment and memory tends to find that secure children remember emotional stimuli better

regardless of valance. For example, when Kirsh and Cassidy (1997) explored differences in children's recollections of stories that depicted scenarios with varied maternal responses to the child character's injury, they discovered that secure children recalled the responsive-caregiver stories better than did avoidant children but also recalled the rejecting-caregiver stories better than did ambivalent children. Similarly, researchers have found that children with more positive representations of parents (i.e., secure children) were more likely to provide more correct information about a distressing event (e.g., receiving a shot at a doctor's visit) and make fewer memory errors (Chae et al., 2014). Additional studies have found that attachment security predicted better memory for stories (with accompanying pictures) about separations (Alexander et al., 2010) and for a storytelling event where children completed attachment-related stories (Alexander & Edelstein, 2001, as reported in Alexander et al., 2002). Finally, adolescents with higher dismissing scores (similar to attachment avoidance) have been found to take longer to recall positive and negative childhood emotional events than those with lower dismissing scores, and recall fewer negative adjectives that could describe their parents (e.g., "insensitive" or "controlling") (Dykas, Woodhouse, Jones, & Cassidy, 2014). Interestingly, these individuals also recalled fewer positive general parenting adjectives (not regarding their parents). The authors explain that dismissing individuals may perceive such positive adjectives as threatening when applied to parents in general because they are reminded of the caregiving they did not experience.

A possible reason why secure children might recall emotional information better than do insecure children is because avoidant/dismissing children often defensively exclude stimuli that could be a painful reminder of their negative histories with caregivers' rejection (Dykas & Cassidy, 2011). Excluding the information would protect avoidant children from feeling distressed, activating their attachment, and facing more potential rejection from caregivers (Bowlby, 1980; Dewitte, 2011; Dykas & Cassidy, 2011). On the other hand, secure children, who have had their distress consistently and appropriately responded to in the past, have no need to be defensive. Additionally, secure children are also better at regulating their emotional responses than are their insecure counterparts (Sroufe, 2005), and so they do not get as overwhelmed with negative emotions following emotional stimuli and would not fear becoming too emotional. This may explain why secure children have been found to have better recollection than did ambivalent children (e.g., Kirsh & Cassidy, 1997), who often attend too much to negative stimuli and overactivate their attachment system (Mikulincer & Shaver, 2007). Such hyperactivation might interfere

with the processes involved in recollection, as previous research has shown that distress can impair memory (Merritt, Ornstein, & Spicker, 1994). Finally, insecure children might not have a template or script based on their personal experiences in which an individual expresses clear emotions and resolves emotional conflicts. A secure attachment, on the other hand, is frequently characterized by its open communication with caregivers especially about emotions and successful resolution of distress (Bowlby, 1980; Bretherton, 1990). Thus, secure children may have an easier time storing and recalling similar emotional information better than their insecure peers because secure children have templates of such events.

One notable exception to the notion that secure children generally remember emotional stimuli better was discovered by Belsky, Spritz, and Crnic (1996). These researchers found that secure children remembered positive events during a puppet show more accurately than did insecure children, but insecure children remembered the negative events better than did secure children. These results suggested that emotional stimuli might be processed in a schema-congruent way such that secure children are more likely to attend to and remember positive events, in line with their positive internal working models, whereas insecure individuals are more likely to process negative events. Such schema-congruent processing could benefit the individual by enabling processing and recollection to occur quickly and automatically (Dykas & Cassidy, 2011), as information easily fits in with what is already known based on past experiences. Thus, perhaps the ways in which internal working models process information depend upon the context or on the specific methodology used (Dykas & Cassidy, 2011).

Gender and Memory

Recollection may of course be affected by factors other than attachment, including gender. Previous research examining gender differences in the memory abilities of children has been mixed, but the research supporting gender differences tends to find a female advantage. For example, girls have been found to outperform boys on verbal memory tasks, including free recall of a poem, vision recognition memory, and audiospatial and visuospatial working memory (Justice, Invernizzi, Geller, & Sullivan, 2005; McGivern et al., 1997; Temple & Cornish, 1993; Vuontela et al., 2003). One possible explanation for gender differences in memory is that the ways males and females process information may differ. Specifically, the selectivity hypothesis proposes that males are more likely to process information based on schemes and focus on information that is relevant to the self, whereas females process information comprehensively with

more detail and in line with what is pertinent to both the self and others (McGivern et al., 1997; Myers-Levy & Loken, 2015).

However, other research has found males to be better on visual-spatial memory tasks (Robinson, Abbott, Berninger, & Busse, 1996), and other studies have found no differences between males and females on memory tasks (e.g., Forrester & Geffen, 1991). Moreover, some research has found that gender differences vary by type of memory, but with females still having the slight advantage (Boman, 2004; Lowe, Mayfield, & Reynolds, 2003; Mileva-Seitz et al., 2015; Visu-Petra, Cheie, & Benga, 2008). For example, Boman (2004) found that females outperform males in recollection of categories and nouns within rehearsed sentences and subject-performed tasks (among other findings), but not in cued recall or recognition for a text passage or face recognition, for which there were no differences. Females have also been found to be better on forward memory tasks (recalling first to last) but not backward memory tasks (recalling last to first) (Mileva-Seitz et al., 2015).

The Current Study

The primary goal of the current study was to examine the association between attachment and children's abilities to recall events from, and make emotional inferences based on, a storybook with an emotional theme. Although many past studies have pointed to an association between attachment and memory in adolescence and adulthood (for a review, see Dykas & Cassidy, 2011), such examinations in childhood are scarce (for exceptions, see Alexander et al., 2010; Belsky et al., 1996; Chae et al., 2014; Kirsh & Cassidy, 1997). This is surprising given that internal working models are a cornerstone of attachment theory, yet limited research has attempted to determine how they function in childhood.

The nature of the relationship between attachment security/insecurity and recollection may depend upon the context and whether or not the methodology calls for passive or active processing (Dykas & Cassidy, 2011). However, given that the current methodology is more in line with the narrative recall task used by Kirsh and Cassidy (1997) rather than the acted puppet task provided by Belsky et al. (1996), we believe our results will follow suit. Based upon their study and the bulk of other previous research (e.g., Alexander et al., 2010; Chae et al., 2014; Dykas et al., 2014), it was hypothesized that more-secure children would better remember the content from the emotional storybook than would less-secure children.

Given that gender may be an additional factor that could influence children's recall, it was considered an important variable to control when examining associations between attachment and memory. Previous research

examining gender differences in children's recall has been mixed (e.g., Justice et al., 2005; Forrester & Geffen, 1991; Robinson et al., 1996) and warrants further investigation. It was expected that, in line with the bulk of the literature examining gender differences in children's memory (e.g., Justice et al., 2005; Temple & Cornish, 1993), girls would display better recollection than boys. Additionally, the current methodology employed verbal memory, which tends to be stronger with girls (Justice et al., 2005).

Because gender and attachment may both be associated with children's recall, it was deemed important to test whether there are any interactive effects. Limited research has examined whether the association between attachment and recollection is stronger for one gender than the other. However, in examining interactive effects of gender and maternal sensitivity (a key indicator of a secure attachment; De Wolff & van IJzendoorn, 1997) on multiple dimensions of cognitive development, Mileva-Seitz et al. (2015) discovered that greater maternal sensitivity predicted fewer errors of omission for boys but not girls. The researchers suggested that the development of boys may be more vulnerable to early parenting than that of girls. Mileva-Seitz et al. did not find similar interactive effects for forward or backward recall, so it appears that a moderated effect depends upon the context. Testing whether attachment and gender interact in predicting recall for storybook events can provide further insight into which contexts this may occur. Based on the findings reported by Mileva-Seitz et al., who suggested that boys are more susceptible to early parenting effects, it was predicted that more-secure boys would display better recollection than less-secure boys, but girls would better remember the content regardless of attachment. Here, attachment might act as a protective factor for boys, who generally perform slightly worse than girls on memory tasks (e.g., Justice et al., 2005; Temple & Cornish, 1993).

Method

Participants

Through flyers distributed in schools, daycares, and local businesses, 83 children, ages 54–63 months, were recruited to participate with their mothers in a larger study about emotional development. Two dyads were dropped from the current analysis because the women were not long-term caregivers of the children (e.g., a grandmother who recently was granted custody of her grandchild), a characteristic deemed necessary for the accurate reporting of attachment. The remaining sample of 81 dyads consisted of 44 boys and 37

girls ($M_{\text{age}} = 56.91$ months) along with their mothers. Ethnicity and maternal education data were missing for 16 dyads and 12 dyads, respectively (12 missing due to unreturned surveys), but the majority of those who reported ethnicity (87.7%) were Caucasian (6.3% African American, 1.5% Hispanic, and 4.6% other), and 72.4% of mothers had a college degree or higher.

Procedure

Mothers were fully briefed on all of the tasks and submitted written consent for their participation and their child's. Tasks were also described to the children beforehand, and children were asked whether they would like to perform the task. Each lab session began with 10 min of free play between the mother and child, followed by a few dyadic tasks. The mother was then taken to an adjacent room where she performed the Attachment Q-Set (AQS) Version 3.0 (Waters & Deane, 1985) under the guidance of a trained researcher, during which her child participated in multiple tasks, including one to assess children's memory following a storybook reading. When the mother and child completed their independent tasks, they rejoined to participate in two final dyadic tasks. At the completion of the lab, mothers were gifted money for their participation and children selected a stuffed animal. Mothers were also given a packet of questionnaires, including a demographic survey, to complete and mail back.

Measures

Attachment. Mothers completed the AQS, which consists of 90 cards that describe a child's secure-base behavior (e.g., "If held in mother's arms, child stops crying and quickly recovers after being frightened or upset"). Mothers sort the cards depending upon how much they are like or unlike their child, until they have nine piles with 10 cards in each. Each card was scored with the number of the pile it was sorted into, and then the mother's sort was correlated with an optimal security sort. Thus, attachment scores range from -1 to 1 , with scores closer to 1 indicating greater security. The average score for the current sample was $.44$ ($SD = .17$). The AQS is a psychometrically sound procedure to measure children's secure base behavior (Teti & McGourty, 1996).

Teti and McGourty (1996) described the general concern that mothers might be biased in reporting their child's attachment. However, they found that mothers can provide valid sorts as long as they are sent the statements in advance, are kept blind to the purpose of measuring attachment, and perform the sort under the guidance of a trained researcher (Teti & McGourty, 1996).

Such recommendations were implemented for the current study. Moreover, a meta-analysis reported that maternal sorts are correlated with observer sorts and Strange Situation classifications (Teti & McGourty, 1996; van IJzendoorn, Vereijken, Bakermans-Kranenburg, Riksen-Walraven, 2004). Maternal sorts have also frequently been found to predict relevant constructs in preschool-aged samples (e.g., Goodvin, Meyer, Thompson, & Hayes, 2008; Laible, Panfile & Makariev, 2008).

Story-recall task. A research assistant read *Owl Babies* (Waddel & Benson, 2002) to each child. The story tells of three baby owls that awaken one night to find their owl mother gone. Throughout the story, they speculate about where they think she might have gone and try to console one another as they become scared. When the mother owl returns, she is surprised to see how upset the babies are because she always comes back. The narrative ends with a happy family reunion and the littlest owl expressing his love for his mother. This story was chosen for its emotional content and because it reflects an attachment-related issue of distress following a separation with a caregiver and the subsequent reunion.

Directly after reading the story to the child, the researcher asked the child 10 open-ended questions. Questions inquired about factual information (sample item: Q—"What did the little baby owl, Bill, keep saying to his brother and sister?" A—"I want my mommy"), as well as emotional inferences (Q—"How did the baby owl, Bill, feel when he realized his mommy was missing?" A—"Sad"). If a child responded with "I don't know," the researcher prompted the child by saying "Sure you do" and repeated the question. If the child responded again without answering, the researcher moved on to the next question.

Children's answers were transcribed verbatim, and a researcher who was blind to the children's attachment scores coded all of the responses on a 3-point scale. Zero points were awarded for completely incorrect answers or if no answer was given, whereas 2 points were awarded for correct answers as stated in the book (for factual information) or correct inferences. One point was awarded for an incorrect answer, but the response was somewhat close or plausible (e.g., responding that the baby owl repeatedly says "I miss my mommy" instead of "I want my mommy"). Scores were summed to provide a memory score, with a maximum score of 20. A second coder, who was also blind to attachment scores, independently coded 20% of the cases, and good interrater reliability was achieved (intraclass correlation = .96). Any discrepancies were given the score determined by the primary coder. The questions yielded adequate interitem reliability (Cronbach's $\alpha = .63$). The distribution of scores had skewness of -1.50 ($SE = .27$) and kurtosis of 2.85 ($SE = .53$) (see Table 1 for other descriptive statistics).

Table 1. Descriptive statistics

	Full sample	Boys	Girls
	Mean (SD)	Mean (SD)	Mean (SD)
Attachment	0.44 (0.17)	0.40 (0.16) ^a	0.48 (0.17) ^a
Story recall	14.96 (3.25)	14.34 (3.77) ^b	15.70 (2.34) ^b

Note. Superscripts with like letters indicate a difference between the means.

^a $p < .05$.

^b $p < .10$.

Results

Independent samples t tests revealed significant gender differences in attachment, $t(79) = -2.13$, $p = .036$, with higher attachment security reported for girls than boys. (See Table 1 for descriptive statistics.) There was also a marginally significant gender difference in story recall ($t = -1.99$, $p = .051$), with girls scoring higher than boys. Finally, there was a marginally significant gender difference in age ($t = -1.91$, $p = .060$), with girls averaging older than boys.

Correlational analyses displayed that attachment was positively correlated with the story-recall score such that as attachment security increased, children were better able to remember more aspects from the story (Table 2). Age in months was marginally associated with gender such that girls tended to be older than boys. Gender was positively correlated with attachment, with girls reported to be more secure than boys.

Hierarchical regression models were conducted to determine whether attachment and gender influenced children's story recall after controlling for any possible age effects. Age was entered on Step 1, gender and attachment terms were centered and entered on Step 2, and an interaction term of gender by attachment was entered on Step 3. The full model predicting recall was significant, $F(4, 76) = 3.82$, $p = .007$ (see Table 3). Attachment made a significant independent contribution to the full model ($t = 2.26$, $p = .026$), with more-secure children scoring higher. No other factors significantly contributed, and the attachment by gender interaction was not significant ($ps > .05$).

Discussion

The main purpose of the current study was to test the association between attachment and children's memory for an emotional storybook. Similar to previous research (e.g., Chae et al., 2014; Kirsh & Cassidy, 1997), it was

Table 2. Correlations

	1	2	3	4
1. Age	—	.21 ⁺	.05	-.13
2. Gender		—	.23 [*]	.21 ⁺
3. Attachment			—	.29 ^{**}
4. Story recall				—

Note. For gender, boys were coded as -1 and girls were coded as 1.

^{**} $p < .01$.

^{*} $p < .05$.

⁺ $p < .10$.

Table 3. Regression model predicting recall

Steps and variables	β in full model	R^2	ΔR^2
Story recall			
1. Age	-.16	.02	
2. Gender attachment	.20 [*]	.14 ^{**}	.12 ^{**}
3. Gender	.24 [*]		
×Attachment	-.17	.17 ^{**}	.03

Note. For gender, boys were coded as -1 and girls were coded as 1.

^{**} $p < .01$.

^{*} $p < .05$.

hypothesized that more-secure children would better remember details from the story and be able to make more emotional inferences than less-secure children because the former are more open to emotional stimuli and better at regulating affect (Main, Kaplan, & Cassidy, 1985; Sroufe, 2005). The findings of the current study support this hypothesis, displaying that more-secure children had better overall recollection. A story about a mother leaving her baby owls might be psychologically painful and remind insecure children of their less-than-optimal caregiving history. This may have led some of the less-secure children to defensively exclude the processing of the information (as is often the case with avoidant individuals; Bowlby, 1980). Other less-secure children may have become emotionally overwhelmed (such as when ambivalent individuals overactivate the attachment system; Mikulincer & Shaver, 2007) and less able to focus on storing and recalling information. Such defensive processing may have an adaptive advantage for less-secure children because it protects them from

remembering the information and experiencing psychological pain. On the other hand, secure children appear to have internal working models free of defensive processes and hyperactivation of the attachment system and can openly process information, leading to better recollection.

Because internal working models are activated in times of distress (Bowlby, 1958; Bretherton & Munholland, 2008), the entire storybook, with its theme of a mother leaving her babies, might be perceived as an emotional stimulus that activated processing in line with internal working models. For additional insight, future research should examine attachment and recollection for details from an emotional storybook and a storybook with a neutral theme to determine whether attachment is associated with memory in general or only within the context of an emotional story. Alexander and Edelstein (2001) found that attachment was associated with memory for an attachment-related storytelling task but not a play event (as reported by Alexander, Quas, & Goodman, 2002). Other research has found that adults with insecure attachments (as measured by the Adult Attachment Interview) had poorer memories for attachment-related events but not for employment-related experiences (Crowell et al., 1996). Similarly, we would not expect to find an association between attachment and memory for a neutral storybook. This would indicate that less-secure children do not have poorer memories in general, but only in matters of emotional or attachment-related stimuli to protect against the painful psychological effects of such stimuli.

There are a few possible alternative explanations of the results. The current results may reflect that secure children paid more attention to the story, enabling them to store the information for later recall. Frosch, Cox, and Goldman (2001) found that secure toddlers were better able to focus their attention while their mother “read” a wordless storybook to them. Similarly, secure children may have better remembered the details because they tend to have better emotional understanding and perspective taking (Laible & Thompson, 1998) or higher IQ (van IJzendoorn & van Vliet-Visser, 1988), both of which are associated with better memory (Rose & Feldman, 1997; Wagner, Handke, & Walter, 2015). Future research should attempt to determine if the memory differences are fully or partially accounted for by such factors.

The secondary hypothesis that girls would have better recollection than boys was partially supported. Females were found to outperform males in their total recollection of the emotional storybook, although this finding was only marginally significant and should be interpreted with caution. Such gender differences fall in line with the selectivity hypothesis that suggests that females are more likely to process details relevant to

others than are males (McGivern et al., 1997; Myers-Levy & Loken, 2015). Alternatively, males are expected to process information in line with their schemas but more so when the information concerns themselves. Although some questions may have capitalized on males' ability to use schematic processing, such as asking how characters felt when they were all alone, these questions did not concern the males themselves and so may have not been fully processed.

Previous findings examining gender differences in children's memory have been quite mixed and tends to depend on the type of memory being assessed. Of the studies that assessed narrative recollection, Justice et al. (2005) found girls were better able to recall a poem that was read to them. However, Lowe et al. (2003) found no differences between boys and girls in their recollection of a short story that was read to them, and Boman (2004) did not find differences in recollection of a text. Additional research is necessary to untangle the mixed results. Nevertheless, the current findings support the growing body of literature supporting a slight female advantage in recollection (e.g., Justice et al., 2005; McGivern et al. 1997; Temple & Cornish, 1993; Vuontela et al., 2003) and are novel by displaying a slight female advantage for storybooks in particular.

Girls were also found to be reported as being more secure than boys. The bulk of the literature using the AQS has not shown gender differences in attachment when using parental sorts (Laible et al., 2008; McCabe, Peterson, & Connors, 2006; Panfile, Laible, & Eye, 2012; Stievenart, Roskam, Meunier, & Van de Moortele, 2012) or observer sorts (Brown, McBride, Shin, & Bost, 2007; Clark & Symons, 2000; De Mulder, Denham, Schmidt, & Mitchell, 2000). In light of this, it is not quite clear why gender differences were found since attachment and internal working models should not be gender-specific (Pierrehumbert et al., 2009), but the findings may be a characteristic specific to our sample or may be an artifact of gender bias resulting from the reported attachment. More importantly, gender did not moderate the effects of attachment on recollection. Mileva-Seitz et al. (2015) found that boys with more sensitive mothers made fewer errors of omission than did those with less sensitive mothers, but sensitivity did not predict errors for girls. However, the researchers did not find gender and attachment to interact in predicting other types of memory outcomes. The current findings are more in line with the latter, as boys and girls did not show a different pattern of recollection based on attachment. This implies that internal working models of attachment work similarly for boys and girls to bias memory for storybook details.

The current study is not without its limitations. The memory task was created for the purpose of the current study and lacks extensive knowledge

about the psychometric properties. We specifically selected a book with an emotional theme with the intent to activate attachment processes and defenses, and created questions based on the main events in the book. Other types of questions that were not included (e.g., questions about the illustrations such as “What color were the owls?”) might have been important to consider. Moreover, the story did not allow for multiple positive questions, which precluded us from testing if attachment security was associated with better remembering both positive and negative events. The current study also did not control for factors such as intelligence, verbal ability, perspective taking, attention, temperament, and comfort level with the researcher, or other aspects that could have potentially influenced the current findings. Additionally, the sample of children was mostly Caucasian. Although the cognitive biasing effects of attachment should not necessarily differ by ethnicities, we cannot assume this without further empirical work. It must also be noted that, due to the correlational nature of this study, the direction of the association between attachment and memory cannot be determined and causation cannot be inferred.

The methodology relied solely on maternal reports of attachment, which yield only a continuum of security/insecurity and could be subject to potential reporter bias. Future studies should also include observations of attachment security that would yield attachment classifications (secure, avoidant, or ambivalent). With this information, studies should test whether avoidant and ambivalent children have similar patterns of poor recall in comparison to secure children. Avoidant children actually might have very poor recall compared to secure children because the former defensively exclude emotional stimuli, but ambivalent children may not differ in recollection from secure children. Similarly, Kirsh and Cassidy (1997) found that, although secure children remembered responsive stories better than avoidant children did, ambivalent children did not significantly differ from either group. Finally, future studies should investigate the different reasons why avoidant and ambivalent individuals might have poorer recall than secure individuals, if that is found to be the case. For example, research should examine whether ambivalent children become too emotional when processing emotional stimuli, and that interferes with storage of the information, but avoidant individuals may not even attend to or process the emotional stimuli at all.

Regardless of its limitations, the current study can add to the literature in multiple ways. While there is great support for the biasing effects of attachment in adolescence and adulthood (Dykas & Cassidy, 2011), limited research (see Alexander et al., 2010; Belsky et al., 1996; Chae et al., 2014; Kirsh & Cassidy, 1997) has examined associations between attachment security and memory in childhood. Studies in adolescence and adulthood

point to the possible long-lasting effects of attachment, but it is also important to show that attachment may have biasing effects even as early as pre-school. Such findings reveal that even young children start to perceive the environment differently based on their caregiving history.

The current findings imply that internal working models may be adaptively processing information, enabling secure children to be open to emotional stimuli but insecure children having to defensively exclude potentially painful information or become too overwhelmed to process it. These findings could have far-reaching developmental and educational implications. Defensively blocking the processing of emotional stimuli so early in life could work to reinforce internal working models further, making them stronger and more difficult to change (Bretherton & Munholland, 2008). Additionally, if insecure children have poorer memory for details from an emotional storybook, they might also score lower on reading comprehension tests in school, especially if the passages are emotional or attachment-related in content. In order to avoid poorer memory for attachment-related stimuli, parents should be coached on how to respond more sensitively to better facilitate a secure attachment with their children.

References

- Ainsworth, M. D. S., Blehar, M. C., Waters, E., & Wall, S. (1978). *Patterns of attachment: A psychological study of the Strange Situation*. Hillsdale, NJ: Erlbaum.
- Alexander, K. W., & Edelstein, R. S. (2001). *Children's attachment and memory for an experienced event*. Poster presented at the biennial meeting of the Society for Research in Child Development, Minneapolis, MN.
- Alexander, K. W., O'Hara, K. D., Bortfeld, H. V., Anderson, S. J., Newton, E. K., & Kraft, R. H. (2010). Memory for emotional experiences in the context of attachment and social interaction style. *Cognitive Development, 25*(4), 325–338. doi:10.1016/j.cogdev.2010.08.002
- Alexander, K. W., Quas, J. A., & Goodman, G. S. (2002). Theoretical advances in understanding children's memory for distressing events: The role of attachment. *Developmental Review, 22*(4), 490–519. doi:10.1016/S0273-2297(02)00004-7
- Belsky, J., Spritz, B., & Crnic, K. (1996). Infant attachment security and affective-cognitive information processing at age 3. *Psychological Science, 7*(2), 111–114. doi:10.1111/j.1467-9280.1996.tb00339.x
- Boman, E. (2004). The effects of noise and gender on children's episodic and semantic memory. *Scandinavian Journal of Psychology, 45*(5), 407–416. doi:10.1111/j.1467-9450.2004.00422.x

- Bowlby, J. (1958). The nature of the child's tie to his mother. *International Journal of Psycho-Analysis*, 39(5), 350–373.
- Bowlby, J. (1969/1982). *Attachment and loss: Vol. 1*. New York: Basic Books.
- Bowlby, J. (1980). *Attachment and loss: Vol. 3. Loss*. New York: Basic Books.
- Bowlby, J. (1988). Lecture 7: The role of attachment in personality development. In *A secure base: Parent-child attachment and healthy human development* (pp. 119–136). New York: Basic Books.
- Bretherton, I. (1990). Open communication and internal working models: Their role in the development of attachment relationships. In R. A. Thomson (Ed.), *Socioemotional development: Nebraska Symposium on Motivation: Vol. 36* (pp. 57–113). Lincoln: University of Nebraska Press.
- Bretherton, I., & Munholland, K. A. (2008). Internal working models in attachment relationships: A construct revisited. In J. Cassidy & P. R. Shaver (Eds.), *Handbook of socialization: Theory, research, and clinical applications* (pp. 102–127). New York: Guilford Press.
- Brown, G.-L., McBride, B.-A., Shin, N., & Bost, K. K. (2007). Parenting predictors of father-child attachment security: Interactive effects of father involvement and fathering quality. *Fathering*, 5(3), 197–219. doi:10.3149/ft.0503.197
- Chae, Y., Goodman, G. S., Larson, R. P., Augusti, E. M., Alley, D., VanMeenen, K. M., . . . Coulter, K. P. (2014). Children's memory and suggestibility about a distressing event: The role of children's and parent's attachment. *Journal of Experimental Child Psychology*, 123(1), 90–111. doi:10.1016/j.jecp.2014.01.005
- Clark, S. E., & Symons, D. K. (2000). A longitudinal study of Q-sort attachment security and self-process at age 5. *Infant and Child Development*, 9(2), 91–104. doi:10.1002/1522-7219(200006)9:2:91::AID-ICD218>3.0.CO;2-0
- Crowell, J. A., Waters, E., Treboux, D., O'Connor, E., Colon-Downs, C., Feider, O., . . . Posada, G. (1996). Discriminant validity of the Adult Attachment Interview. *Child Development*, 67(5), 2584–2599. doi:10.2307/1131642
- De Mulder, E. K., Denham, S., Schmidt, M., & Mitchell, J. (2000). Q-sort assessment of attachment security during the preschool years: Links from home to school. *Developmental Psychology*, 36(2), 274–282. doi:10.1037/0012-1649.36.2.274
- Dewitte, M. (2011). Adult attachment and attentional inhibition of interpersonal stimuli. *Cognition and Emotion*, 25(4), 612–625. doi:10.1080/02699931.2010.508683
- De Wolff, M. S., & van IJzendoorn, M. H. (1997). Sensitivity and attachment: A meta-analysis on parental antecedents of infant attachment. *Child Development*, 68(4), 571–591. doi:10.2307/1132107
- Dykas, M. J., & Cassidy, J. (2011). Attachment and the processing of social information: Theory and evidence. *Psychological Bulletin*, 137(1), 19–46. doi:10.1037/a0021367

- Dykas, M. J., Woodhouse, S. S., Jones, J. D., & Cassidy, J. (2014). Attachment-related biases in adolescents' memory. *Child Development, 85*(6), 2185–2201. doi:10.1111/cdev.12268
- Forrester, G., & Geffen, G. (1991). Performance measures of 7- to 15-year-old children on the Auditory Verbal Learning Test. *Clinical Neuropsychologist, 5*(4), 345–359. doi:10.1080/13854049108404102
- Frosch, C. A., Cox, M. J., & Goldman, B. D. (2001). Infant-parent attachment and parental child behavior during parent-toddler storybook interaction. *Merrill-Palmer Quarterly, 47*(4), 445–474. doi:10.1353/mpq.2001.0022
- Goodvin, R., Meyer, S., Thompson, R. A., & Hayes, R. (2008). Self-understanding in early childhood: Associations with child attachment security and maternal negative affect. *Attachment & Human Development, 10*(4), 433–450. doi:10.1080/14616730802461466
- Justice, L. M., Invernizzi, M., Geller, K., & Sullivan, A. E. (2005). Descriptive-developmental performance of at-risk preschoolers on early literacy tasks. *Reading Psychology, 26*(1), 1–25. doi:10.1080/02702710490897509
- Kirsh, S. J., & Cassidy, J. (1997). Preschoolers' attention to and memory for attachment-relevant information. *Child Development, 68*(6), 1143–1153. doi:10.1111/1467-8624.ep9712191524
- Laible, D., Panfile, T., & Makariev, D. (2008). The quality and frequency of mother-toddler conflict: Links with attachment and temperament. *Child Development, 79*(2), 426–443. doi:10.1111/j.1467-8624.2007.01134.x
- Laible, D. J., & Thompson, R. A. (1998). Attachment and emotional understanding in preschool children. *Developmental Psychology, 34*(5), 1038–1045. doi:10.1037/0012-1649.34.5.1038
- Lowe, P. A., Mayfield, J. W., & Reynolds, C. R. (2003). Gender differences in memory test performance among children and adolescents. *Archives of Clinical Neuropsychology, 18*(8), 865–878. doi:10.1093/arclin/18.8.865
- Main, M., Kaplan, N., & Cassidy, J. (1985). Security in infancy, childhood, and adulthood: A move to the level of representation. *Monographs of the Society for Research in Child Development, 50*(1–2), 66–104. doi:10.2307/3333827
- McCabe, A., Peterson, C., & Connors, D. M. (2006). Attachment security and narrative elaboration. *International Journal of Behavioral Development, 30*(5), 398–409. doi:10.1177/0165025406071488
- McGivern, R. F., Huston, J. P., Byrd, D., King, T., Siegle, G. J., & Reilly, J. (1997). Sex differences in visual recognition memory: Support for a sex-related difference in attention in adults and children. *Brain and Cognition, 34*(3), 323–336. doi:10.1006/brcg.1997.0872
- Merritt, K. A., Ornstein, P. A., & Spicker, B. (1994). Children's memory for a salient medical procedure: Implications testimony. *Pediatrics, 94*(1), 17–23.
- Mikulincer, M., & Shaver, P. R. (2007). *Attachment in adulthood: Structure, dynamics and change*. New York: Guilford Press.

- Mileva-Seitz, V. R., Ghassabian, A., Bakermans-Kranenburg, M. J., van den Brink, J. D., Linting, M., Jaddoe, V. W. V., . . . van IJzendoorn, M. H. (2015). Are boys more sensitive to sensitivity? Parenting and executive function in preschoolers. *Journal of Experimental Child Psychology, 130*, 193–208. doi:10.1016/j.jecp.2014.08.008
- Myers-Levy, J., & Loken, B. (2015). Revisiting gender differences: What we know and what lies ahead. *Journal of Consumer Psychology, 25*(1), 129–149. doi:10.1016/j.jcps.2014.06.003
- Panfile, T. M., Laible, D. J., & Eye, J. (2012). Conflict frequency within mother–child dyads across contexts: Links with attachment security and gender. *Early Childhood Research Quarterly, 27*(1), 147–155.
- Pierrehumbert, B., Santelices, M. P., Ibáñez, M., Alberdi, M., Ongari, B., Roskam, I., . . . Borghini, A. (2009). Gender and attachment representations in the preschool years: Comparisons between five countries. *Journal of Cross-Cultural Psychology, 40*(4), 543–566. doi:10.1177/0022022109335181
- Robinson, N. M., Abbott, R. D., Berninger, V. W., & Busse, J. (1996). Structure of abilities in math-precocious young children: Gender similarities and differences. *Journal of Educational Psychology, 88*(2), 341–352. doi:10.1037/0022-0663.88.2.341
- Rose, S. A., & Feldman, J. F. (1997). Memory and speed: Their role in the relation of infant information processing to later IQ. *Child Development, 68*(4), 630–641. doi:10.1111/j.1467-8624.1997.tb04226.x
- Sroufe, L. A. (2005). Attachment and development: A prospective, longitudinal study from birth to adulthood. *Attachment & Human Development, 7*(4), 349–367. doi:10.1080/14616730500365928
- Stievenart, M., Roskam, I., Meunier, J. C., & Van de Moortele, G. (2012). Assessment of preschoolers' attachment security using the Attachment Q-set and the Attachment Story Completion Task. *International Journal of Education and Psychological Assessment, 12*(1), 62–80.
- Temple, C. M., & Cornish, K. M. (1993). Recognition memory for words and faces in schoolchildren: A female advantage for words. *British Journal of Developmental Psychology, 11*(4), 421–426. doi:10.1111/j.2044-835X.1993.tb00613.x
- Teti, D., & McGourty, S. (1996). Using mothers vs. trained observers in assessing children's secure base behavior: Theoretical and methodological considerations. *Child Development, 67*(2), 597–605. doi:10.2307/1131834
- van IJzendoorn, M. H., & van Vliet-Visser, S. (1988). The relationship between quality of attachment in infancy and IQ in kindergarten. *Journal of Genetic Psychology, 149*(1), 23–28. doi:10.1080/00221325.1988.10532135
- van IJzendoorn, M. H., Vereijken, C. M. J. L., Bakermans-Kranenburg, M. J., & Riksen-Walraven, J. M. (2004). Assessing attachment security with the Attachment Q Sort: Meta-analytic evidence for the validity of the observer AQS. *Child Development, 75*(4), 1188–1213. doi:10.1111/j.1467-8624.2004.00733.x

- Visu-Petra, L., Cheie, L., & Benga, O. (2008). Short-term memory performance and metamemory judgments in preschool and early school-age children: A quantitative and qualitative analysis. *Cognition, Brain, Behavior, 12*(1), 71–101.
- Vuontela, V., Steenari, M., Carlson, S., Koivisto, J., Fjälberg, M., & Aronen, E. T. (2003). Audiospatial and visuospatial working memory in 6–13 year old school children. *Learning & Memory, 10*(1), 74–81. doi:10.1101/lm.53503
- Waddell, M., & Benson, P. (2002). *Owl babies*. Somerville, MA: Candlewick Press.
- Wagner, U., Handke, L., & Walter, H. (2015). The relationship between trait empathy and memory formation for social vs. non-social information. *BMC Psychology, 3*(1), 2. doi:10.1186/s40359-015-0058-3
- Waters, E., & Deane, K. (1985). Defining and assessing individual difference in attachment relations: Q-methodology and the organization of behavior in infancy and early childhood. In I. Bretherton & E. Waters (Eds.), *Monographs of the Society for Research in Child Development, 50*(1–2), 41–65.

INDEX
Vol. 63 (2017)

Issue 1	1–154
Issue 2	155–310
Issue 3	311–424
Issue 4	425–566

- Aikins, J. W. & Ratner, H. H.—Introduction to This *MPQ* Special Issue (Family Ties: The Role of Regulation and Context in Resilience). 1–8
- Algina, J., *See* Wang, F., Algina, J., Snyder, P., & Cox, M.
- Andrews, N. C. Z., *See* Field, R. D., Martin, C. L., Andrews, N. C. Z., England, D. E., & Zosuls, K. M.
- Bakermans-Kranenburg, M. J., *See* Wildeboer, A., Thijssen, S., Bakermans-Kranenburg, M. J., Jaddoe, V. W. V., White, T., Tiemeier, H., & Van IJzendoorn, M. H.
- Barhight, L. R., Hubbard, J. A., Swift, L. E., & Konold, T. R.—A Multitrait–Multimethod Approach to Assessing Childhood Aggression and Related Constructs. 367–395
- Beatty, J. R., *See* Ondersma, S. J., McGoron, L., & Beatty, J. R.
- Beeghly, M., *See* Delonis, M. S., Beeghly, M., & Irwin, J. L.
- Bocknek, E. L., Dayton, C., Raveau, H. A., Richardson, P., Brophy-Herb, H. E., & Fitzgerald, H. E.—Routine Active Playtime With Fathers Is Associated With Self-Regulation in Early Childhood. 105–134
- Boyko, L., *See* Zarbatany, L., Tremblay, P. F., Ellis, W. E., Chen, X., Kinal, M., & Boyko, L.
- Bradley, R. H.—Strolling Through Budapest: On the Outside Looking In. 9–14
- Brophy-Herb, H. E., *See* Bocknek, E. L., Dayton, C., Raveau, H. A., Richardson, P., Brophy-Herb, H. E., & Fitzgerald, H. E.
- Busching, R., *See* Rohlf, H., Busching, R., & Krahé, B.

- Chan, C. H. C., *See* Ng, C. W. E., Lam, K. M. J., & Chan, C. H. C.
- Chaudhry, K., *See* Goodlett, B. D., Trentacosta, C. J., McLear, C., Crespo, L., Wheeler, R., Williams, A., Chaudhry, K., & Smith-Darden, J.
- Chen, X., *See* Zabatany, L., Tremblay, P. F., Ellis, W. E., Chen, X., Kinal, M., & Boyko, L.
- Cox, M., *See* Wang, F., Algina, J., Snyder, P., & Cox, M.
- Crespo, L., *See* Goodlett, B. D., Trentacosta, C. J., McLear, C., Crespo, L., Wheeler, R., Williams, A., Chaudhry, K., & Smith-Darden, J.
- Dayton, C., *See* Bocknek, E. L., Dayton, C., Raveau, H. A., Richardson, P., Brophy-Herb, H. E., & Fitzgerald, H. E.
- Delonis, M. S., Beeghly, M., & Irwin, J. L.—Mother-Toddler Interaction Quality as a Predictor of Developmental and Behavioral Outcomes in a Very Preterm Sample. 15–53
- Eggum-Wilkens, N. D., *See* Zhang, L., Eggum-Wilkens, N. D., Eisenberg, N., & Spinrad, T. L.
- Eisenberg, N., *See* Zhang, L., Eggum-Wilkens, N. D., Eisenberg, N., & Spinrad, T. L.
- Ellis, W. E., *See* Zabatany, L., Tremblay, P. F., Ellis, W. E., Chen, X., Kinal, M., & Boyko, L.
- England, D. E., *See* Field, R. D., Martin, C. L., Andrews, N. C. Z., England, D. E., & Zosuls, K. M.
- Esterach, J. M., *See* Garcia, A. S., Ren, L., Esterach, J. M., & Raikes, H. H.
- Field, R. D., Martin, C. L., Andrews, N. C. Z., England, D. E., & Zosuls, K. M.—The Influence of Gender-Based Relationship Efficacy on Attitudes Toward School. 396–424
- Fitzgerald, H. E., *See* Bocknek, E. L., Dayton, C., Raveau, H. A., Richardson, P., Brophy-Herb, H. E., & Fitzgerald, H. E.
- Garcia, A. S., Ren, L., Esterach, J. M., & Raikes, H. H.—Influence of Child Behavioral Problems and Parenting Stress on Parent–Child Conflict Among Low-Income Families: The Moderating Role of Maternal Nativity. 311–339
- Gazelle, H. & Shell, M. D.—Behavioral Profiles of Anxious Solitary Children: Predicting Peer Relations Trajectories from Third Through Fifth Grades. 237–281
- Gee, C. B., *See* Varga, C. M. & Gee, C. B.
- Goodlett, B. D., Trentacosta, C. J., McLear, C., Crespo, L., Wheeler, R., Williams, A., Chaudhry, K., & Smith-Darden, J.—Maternal Depressive

Symptoms and At-Risk Young Children's Internalizing Problems: The Moderating Role of Mothers' Positivity. 77–104

- Haden, C. A., *See* Marcus, M., Haden, C. A., & Uttal, D. H.
- Halt, A., *See* Murphy, T., Jehl, B., Hamel, K., McCurdy, K., & Halt, A.
- Hamel, K., *See* Murphy, T., Jehl, B., Hamel, K., McCurdy, K., & Halt, A.
- Hubbard, J. A., *See* Barhight, L. R., Hubbard, J. A., Swift, L. E., & Konold, T. R.
- Irwin, J. L., *See* Delonis, M. S., Beeghly, M., & Irwin, J. L.
- Jaddoe, V. W. V., *See* Wildeboer, A., Thijssen, S., Bakermans-Kranenburg, M. J., Jaddoe, V. W. V., White, T., Tiemeier, H., & Van IJzendoorn, M. H.
- Jehl, B., *See* Murphy, T., Jehl, B., Hamel, K., McCurdy, K., & Halt, A.
- Kinal, M., *See* Zarbatany, L., Tremblay, P. F., Ellis, W. E., Chen, X., Kinal, M., & Boyko, L.
- King, T., McKean, C., Rush, R., Westrupp, E. M., Mensah, F. K., Reilly, S., & Law, J.—Acquisition of Maternal Education and Its Relation to Single-Word Reading in Middle Childhood: An Analysis of the Millennium Cohort Study. 181–209
- Konold, T. R., *See* Barhight, L. R., Hubbard, J. A., Swift, L. E., & Konold, T. R.
- Krahé, B. *See* Rohlf, H., Busching, R., & Krahé, B.
- Lam, K. M. J., *See* Ng, C. W. E., Lam, K. M. J., & Chan, C. H. C.
- Law, J., *See* King, T., McKean, C., Rush, R., Westrupp, E. M., Mensah, F. K., Reilly, S., & Law, J.
- Marcus, M., Haden, C. A., & Uttal, D. H.—STEM Learning and Transfer in a Children's Museum and Beyond. 155–180
- Martin, C. L., *See* Field, R. D., Martin, C. L., Andrews, N. C. Z., England, D. E., & Zosuls, K. M.
- McCurdy, K., *See* Murphy, T., Jehl, B., Hamel, K., McCurdy, K., & Halt, A.
- McGoron, L., *See* Ondersma, S. J., McGoron, L., & Beatty, J. R.
- McKean, C., *See* King, T., McKean, C., Rush, R., Westrupp, E. M., Mensah, F. K., Reilly, S., & Law, J.
- McLear, C., *See* Goodlett, B. D., Trentacosta, C. J., McLear, C., Crespo, L., Wheeler, R., Williams, A., Chaudhry, K., & Smith-Darden, J.
- Mensah, F. K., *See* King, T., McKean, C., Rush, R., Westrupp, E. M., Mensah, F. K., Reilly, S., & Law, J.

- Murphy, T., Jehl, B., Hamel, K., McCurdy, K., & Halt, A.—Children's Recall of Storybook Events: Links with Attachment and Gender. 543–560
- Muzik, M., *See* Wong, K., Stacks, A. M., Rosenblum, K. L., & Muzik, M.
- Ng, C. W. E., Lam, K. M. J., & Chan, C. H. C.—The Positive Adjustment of Low-Income Youths with Relational and Community Support: the Mediating Role of Hope. 514–542
- Ondersma, S. J., McGoron, L., & Beatty, J. R.—An Ecodevelopmental Exploration of Mediators Between Maltreatment in Childhood and Drug Use During Pregnancy. 135–154
- Raikes, H. H., *See* Garcia, A. S., Ren, L., Esteraich, J. M., & Raikes, H. H.
- Ratner, H. H., *See* Aikins, J. W. & Ratner, H. H.
- Raveau, H. A., *See* Bocknek, E. L., Dayton, C., Raveau, H. A., Richardson, P., Brophy-Herb, H. E., & Fitzgerald, H. E.
- Reilly, S., *See* King, T., McKean, C., Rush, R., Westrupp, E. M., Mensah, F. K., Reilly, S., & Law, J.
- Ren, L., *See* Garcia, A. S., Ren, L., Esteraich, J. M., & Raikes, H. H.
- Richardson, P., *See* Bocknek, E. L., Dayton, C., Raveau, H. A., Richardson, P., Brophy-Herb, H. E., & Fitzgerald, H. E.
- Rohlf, H., Busching, R., & Krahe, B.—Longitudinal Links Between Maladaptive Anger Regulation, Peer Problems, and Aggression in Middle Childhood. 282–310
- Rosenblum, K. L., *See* Wong, K., Stacks, A. M., Rosenblum, K. L., & Muzik, M.
- Rush, R., *See* King, T., McKean, C., Rush, R., Westrupp, E. M., Mensah, F. K., Reilly, S., & Law, J.
- Shell, M. D., *See* Gazelle, H. & Shell, M. D.
- Smith-Darden, J., *See* Goodlett, B. D., Trentacosta, C. J., McLearn, C., Crespo, L., Wheeler, R., Williams, A., Chaudhry, K., & Smith-Darden, J.
- Snyder, P., *See* Wang, F., Algina, J., Snyder, P., & Cox, M.
- Spinrad, T. L., *See* Zhang, L., Eggum-Wilkens, N. D., Eisenberg, N., & Spinrad, T. L.
- Stacks, A. M., *See* Wong, K., Stacks, A. M., Rosenblum, K. L., & Muzik, M.
- Swift, L. E., *See* Barhight, L. R., Hubbard, J. A., Swift, L. E., & Konold, T. R.
- Thijssen, S., *See* Wildeboer, A., Thijssen, S., Bakermans-Kranenburg, M. J., Jaddoe, V. W. V., White, T., Tiemeier, H., & Van IJzendoorn, M. H.

- Tiemeier, H., *See* Wildeboer, A., Thijssen, S., Bakermans-Kranenburg, M. J., Jaddoe, V. W. V., White, T., Tiemeier, H., & Van IJzendoorn, M. H.
- Tremblay, P. F., *See* Zaratany, L., Tremblay, P. F., Ellis, W. E., Chen, X., Kinal, M., & Boyko, L.
- Trentacosta, C. J., *See* Goodlett, B. D., Trentacosta, C. J., McLearn, C., Crespo, L., Wheeler, R., Williams, A., Chaudhry, K., & Smith-Darden, J.
- Uttal, D. H. *See* Marcus, M., Haden, C. A., & Uttal, D. H.
- Van IJzendoorn, M. H. *See* Wildeboer, A., Thijssen, S., Bakermans-Kranenburg, M. J., Jaddoe, V. W. V., White, T., Tiemeier, H., & Van IJzendoorn, M. H.
- Varga, C. M. & Gee, C. B.—Co-parenting, Relationship Quality, and Father Involvement in African American and Latino Adolescents. 210–236
- Wang, F., Algina, J., Snyder, P., & Cox, M.—Children’s Task Engagement During Challenging Puzzle Tasks. 425–457
- Westrupp, E. M., *See* King, T., McKean, C., Rush, R., Westrupp, E. M., Mensah, F. K., Reilly, S., & Law, J.
- Wheeler, R., *See* Goodlett, B. D., Trentacosta, C. J., McLearn, C., Crespo, L., Wheeler, R., Williams, A., Chaudhry, K., & Smith-Darden, J.
- White, T., *See* Wildeboer, A., Thijssen, S., Bakermans-Kranenburg, M. J., Jaddoe, V. W. V., White, T., Tiemeier, H., & Van IJzendoorn, M. H.
- Wildeboer, A., Thijssen, S., Bakermans-Kranenburg, M. J., Jaddoe, V. W. V., White, T., Tiemeier, H., & Van IJzendoorn, M. H.—Anxiety and Social Responsiveness Moderate the Effect of Situational Demands on Children’s Donating Behavior. 340–366
- Williams, A., *See* Goodlett, B. D., Trentacosta, C. J., McLearn, C., Crespo, L., Wheeler, R., Williams, A., Chaudhry, K., & Smith-Darden, J.
- Wong, K., Stacks, A. M., Rosenblum, K. L., & Muzik, M.—Parental Reflective Functioning Moderates the Relationship Between Difficult Temperament in Infancy and Behavior Problems in Toddlerhood. 54–76
- Zaratany, L., Tremblay, P. F., Ellis, W. E., Chen, X., Kinal, M., & Boyko, L.—Peer Clique Participation of Victimized Children: Characteristics and Implications for Victimization Over a School Year. 485–513
- Zhang, L., Eggum-Wilkens, N. D., Eisenberg, N., & Spinrad, T. L.—Children’s Shyness, Peer Acceptance, and Academic Achievement in the Early School Years. 458–484
- Zosuls, K. M., *See* Field, R. D., Martin, C. L., Andrews, N. C. Z., England, D. E., & Zosuls, K. M.

Submission of Manuscripts

Merrill-Palmer Quarterly serves as a source of new research studies in human development, theoretical papers, critical reviews of literature, and scholarly commentaries. The purview of *Merrill-Palmer Quarterly* encompasses theory and research on all areas of child and adolescent development, and incorporates the journal's historical commitment to the study of development in context. The Editors are primarily interested in submissions that advance developmental theory and generate novel findings from sound developmental methods and designs. Also preferred are empirical investigations that contain provocative aims, multiple studies, and innovative methods. Articles focused on technical issues (e.g., creation and evaluation of measures, statistical analyses, etc.) are of lesser interest unless they contain an original substantive (developmental) component. This same restriction applies to investigations that do *not* include infants, children, or adolescents as participants.

Manuscript Submission

Follow the instructions and specifications provided in the *Publication Manual of the American Psychological Association* (2010). The 6th edition of the APA manual may be purchased from APA Order Dept., P.O. Box 92984, Washington, DC 20090-2984 USA. Begin each of the following on a new page: title page, abstract, first page of text, references, appendix, footnotes, tables, figure captions, and figures. Double space *everything*, and please use 12-point font. Text should be left-aligned, not justified, and page numbers inserted at the top right corner for review purposes. Information about the authors (e.g., institutional affiliations, contact information, etc.) should be reported only on the title page (the information on this page will be removed by our editorial office before the blind review process begins), using the APA three-paragraph format (i.e., affiliations, acknowledgments, contact information). Blind review requires that information that might identify the author(s) be removed from all subsequent pages of the manuscript. Include an abstract that does not exceed 150 words in length. Most reports of empirical investigations that are considered for publication in *Merrill-Palmer Quarterly* do not exceed 30–40 pages, all inclusive (i.e., including references, tables, and figures). Submissions must be accompanied by a cover letter in which the corresponding author affirms that: (a) the manuscript (and findings) is not under consideration by another publisher or journal; (b) the study reported in this manuscript has been conducted in accordance with APA ethical guidelines. For studies that are part of a larger project, or have aspects in common with previously published articles, please explain how the various parts are related. The cover letter should contain contact information for the corresponding author: e-mail address, postal (street) address, and phone number. The corresponding author is responsible for keeping co-authors apprised of information pertaining to manuscript submission, review, and decisions. Cover letter and manuscript should be submitted electronically to <http://digitalcommons.wayne.edu/mpq> in MSWord format. Instructions about how to submit cover letters and manuscripts electronically are provided on this website. Please direct inquiries or requests for additional information to mpq@asu.edu.

Dr. Gary W. Ladd, Editor

Merrill-Palmer Quarterly Editorial Office

T. Denny Sanford School of Social and Family Dynamics

P.O. Box 873701

Arizona State University

Tempe, AZ 85287-3701

MPQ website: <http://digitalcommons.wayne.edu/mpq>

E-mail: mpq@asu.edu

Phone: (480) 727-7199

FAX: (480) 965-0334

