Secure Base Script Stability and Early Childhood Competence

by

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Abstract

Internal representations of attachment inform children about themselves and the world around them and shape the expectations they have for relationships. Secure representations of attachment – measured by the secure base script – have been linked to positive functioning in several domains of early childhood development, including social competence and executive functioning. The present study used both cross-sectional and longitudinal preschool samples to assess the influence of secure base script access on domains of adaptive functioning in early childhood. Differences across ages three and four were also examined. Better secure base script access predicted positive functioning in several domains and the relationships differed between younger and older children. The secure base script was found to be moderately stable over time, and while script scores at Time 1 were significantly associated with adaptive functioning constructs at Time 2, Time 1 secure base script did not predict subsequent functioning, nor did Time 2 script scores mediate the relationship. This study also included a replication of Nichols et al. (2019) with the addition of an additional year of data. The results of Nichols et al. were partially replicated. The results of this study offer further support for the notion that secure attachment representations are informative for early childhood adaptation and that child age plays a role in that relationship.

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List of Abbreviations

AAI	Adult Attachment Interview
ASA	Attachment Script Assessment
ASCT	Attachment Story Completion Task
CBQ	Child Behavior Questionnaire
CFI	Comparative Fit Index
EEA	Era of Evolutionary Adaptedness
EF	Executive Functioning
IC	Inhibitory Control
IWM	Internal Working Model
PIPPS	Penn Interactive Peer Play Scale
PPVT	Peabody Picture Vocabulary Test
RMSEA	Root Mean Squared Error of Approximation
SBS	Secure Base Script
SC	Social Competence
SCBE	Social Competence and Behavior Evaluation Scale
SSP	Strange Situation Procedure
STRS	Student-Teacher Relationship Scale
TCR	Positive Teacher-Child Relationship
WM	Working Memory

Introduction

It has long been acknowledged that there is a strong and empirically observable bond between a child and their primary caregiver, usually the mother, that forms early in life and remains strong throughout childhood and adolescence (and for most into adulthood). However, the psychosocial processes underlying the development of this bond and its function in the child's life were not completely understood. Consequently, the nature of the child's tie to the primary caregiver has been a source of controversy for over a century. Freud and his followers proposed that the mother-child bond arose as a result of mothers satisfying the infant's physiological drives, including feeding and thermoregulation. In his drive-reduction model, Freud explained that the infant associates the mother (or other primary caregiver) with the pleasure of drive satisfaction (Freud, 1910/1957). Harlow's famous 1958 study with infant monkeys undermined Freud's drive-reduction theory, because his monkeys sought the cloth "mother" (i.e., a plastic jug wrapped in a towel) that provided contact comfort in times of distress, rather than the wire mother (similar frame to cloth mother but made of bare wire) that provided food. Bowlby's (1944) work further undermined psychoanalytic hypotheses intended to explain the mother-child bond. Bowlby's attachment theory was grounded in in ethological and evolutionary principles. His model was supported by the programmatic work of Ainsworth and associates, especially with her observations of infants in Uganda, which gave credence to the notion that attachment and maternal sensitivity were universal constructs (Ainsworth, 1967; Ainsworth et al., 1978). By the end of the 20th century, the Bowlby/Ainsworth theory of attachment formation and maintenance was the dominant explanation for how and why infants formed and maintained attachment relationships with their primary caregivers.

Literature Review

Attachment Theory

The Ethological Perspective

Although Bowlby's theory was initially intended to repair and support psychoanalytic theory, it became an important touchstone for the field of developmental psychology. While studying the development of the orphaned children of World War II, he observed that despite all their physical needs being met the children were failing to thrive and many died before reaching early childhood (Bowlby, 1951). These children were fed, clothed, and sheltered but were isolated from prolonged contact with adults and other children, often being confined to their cribs for extended periods of time. Though these children were cared for, they lacked a true caregiver, with whom a specific emotional connection might be formed. This observation, along with Rene Spitz's (1945) work with hospitalized infants supported the notion of "maternal deprivation" which states that a child's lack of a warm and continuous relationship with a maternal figure has serious consequences in childhood and across the lifespan for both mental health and personality development. Bowlby found support for this concept in his 1944 work with juvenile delinquents, where he discovered a link between criminal behavior and prolonged separation from a maternal figure in early through middle childhood (Bowlby, 1944). Bowlby also worked with James Robertson, a psychiatric social worker, in the early 1950s to study the effect of maternal separation on young children (Bowlby & Robertson, 1952). Robertson and Bowlby made several documentary films, the most famous of which centered on a two-year-old's stay in a pediatric hospital ward without her mother, demonstrating the distress, and subsequent grief reactions of maternal separation (Robertson, 1952).

These findings led to Bowlby's development of attachment theory. Moving beyond the traditional psychodynamic and learning theories of attachment, Bowlby approached attachment from an ethological-evolutionary perspective after he became familiar with ethology through his acquaintances with Robert Hinde and Niko Tinbergen (Bowlby, 1969; van der Horst et al., 2007). Grounded in Darwin's (1859) theory of natural selection, Bowlby developed the concept of the "environment of evolutionary adaptedness" (EEA; Bowlby, 1969). The EEA refers not to a specific period of human history, but the overall environment or "conceptual space" in which humans adapted to survive (Bowlby, 1969). The EEA is not a specific period of human speciation, because the process of human evolution was so gradual; therefore, it is not possible to determine exactly when attachment behaviors began to be targets of natural selection. Because attachment behaviors and behavioral organization have been observed in both old and new world primates and in other species characterized by a long lifespan and groups made up primarily of related individuals (e.g., elephants; Gubernick, 1981; Kondo-Ikemura & Waters, 1995; Mason & Mendoza, 1998; Rockett & Carr, 2014), it seems safe to suggest that human attachment relationships have a deep evolutionary history.

Within the EEA, Bowlby argued that selection pressures supported the assembly of an attachment behavioral system, in which the security promoted by attachment behaviors allowed for the continuation of exploration and survival. To survive in a harsh and deadly environment, constant vigilance was necessary on the part of caregivers to ensure the safety and survival of infants, who were at great risk of death from predators and other environmental conditions. Infant behaviors that maintained caregiver-proximity would be expected to be targets for selection in this environment. Behaviors relevant to the attachment behavioral system include crying, reaching, and smiling, among other things (Bowlby, 1969). Attachment behavior has the predictable outcome of increasing the proximity of the child to the caregiver, which allows for the protection of the child and supports exploration of the physical and social environment relatively free from danger. According to Bowlby (1969), the function of attachment was to promote proximity to the protection of the caregiver, and thereby increasing the likelihood of survival. Through repeated interaction, the caregiver-infant dyad forms a relationship (supported in part by hormones like oxytocin; Scatliffe et al., 2019; Szymanska et al., 2017). The protection resulting from the attachment behavioral system resulted in the attachment relationship between the caregiver and child. The attachment relationship with a primary attachment figure motivates the child to seek proximity to the attachment figure in times of distress and use the attachment figure as a secure base from which to explore the world.

Infant Attachment

The infant's first attachment bond constitutes the emotional tie between the infant and the primary caregiver, usually the mother or another caregiving figure; although attachment to any reliably present and responsive individual is possible (Ainsworth, 1972). Within the attachment relationship, the caregiver's reliable response to the infant's signaling behavior allows the infant to identify their caregiver and keeps the infant and caregiver physically close. Proximity to the caregiver is one of the key goals of the attachment behavior system. The attachment system becomes activated when an infant desires contact with the caregiver and signals to them. Activation of the attachment system triggers behaviors that are intended to alert the attachment figure and bring them close so they can meet the infant's need. In the case of a frightened infant, the infant will likely cry which gains the attention of the mother, who will respond by first approaching the signaling infant and then comforting the infant and ensuring safety.

The quality of the attachment bond between an infant and their caregiver is largely dependent on the caregiver's availability and responsiveness (i.e., receptivity) to the infant's signals and is not necessarily indicated by attachment behavior (Ainsworth, 1972; Bowlby, 1969). Infants can co-construct attachments with multiple caregivers and these attachment bonds may exist in a hierarchy (Sagi-Schwartz & Aviezer, 2005; Sagi-Schwartz et al., 1985). However, the capacity to form attachment bonds is not limitless (Cassidy, 2016), and infants will rarely have attachment networks exceeding four to six bonds. Simultaneous attachments to the primary caregiver, secondary caregiver, and older siblings are possible, though the primary caregiver tends to be the child's first source of comfort when distressed (Bowlby, 1969/1982; Colin, 1996). The existence of the attachment hierarchy is evidenced by differing levels of tolerance of separation from attachment figures; for example, an infant is more tolerant of separation from an older sibling than separation from their mother (Ainsworth, 1989). According to Colin (1996), the structure of the hierarchy typically is dependent upon time spent in attachment figures' care, the quality of care provided, the figures' emotional investment in the attachment relationship, and social cues, such as facial expressions and tone of voice. Thus, while multiple attachments are typical, the attachment to the primary caregiver tends to be the most important for the infant's functioning and future development (Colin, 1996).

Internal Working Models

In the Bowlby-Ainsworth attachment model, infant attachment is the foundation upon which the sense of self and expectations for future relationships with others is built. The attachment relationship and its mental representation informs a child's expectations for themselves and others (Bretherton, 1991). How their caregivers respond to their needs builds a child's understanding of their own importance and the validity of their feelings and needs

(Bowlby, 1969). Internal working models (IWM) refer to the relationship representations a child constructs (or co-constructs) based on routine interactions with the attachment figure (Bowlby, 1969; Craik, 1943). When a child acquires the language capacity necessary for symbolic communication and sensorimotor communication becomes internalized, an internal attachment representation (IWM) becomes possible. IWMs allow the child to predict the behavior and attitudes of others in certain situations based on previous experiences. One example of an IWM would be the expectation that when a child is injured and cries out for the mother, she will comfort the child and patch up their wounds. This would be the IWM of a child with warm and responsive caregivers who responds readily to their needs. The IWM of a child who has not experienced prompt or appropriate responses to signals of injury may include the expectation of being scolded for being clumsy or ignored. Bowlby believed IWMs are not immutable and may change as the child gathers more information about the world and the attachment figures in their life. Consistent experience with sensitive caregiving after toddlerhood will likely result in a more positive IWM, even if a child had less than ideal experiences earlier in life (Bowlby, 1969).

For a child with a positive IWM of their caregiver's responsiveness, the child usually will actively seek out the caregiver in times of distress with the confidence that their needs will be met and validated. For a child with a negative IWM of their caregiver's responsiveness, the child may choose not to seek out the caregiver in times of distress, may repress needs for comfort, and may invalidate their own feelings because their caregiver invalidates them as well (Bretherton & Munholland, 2016). IWMs are the infrastructure supporting how people interact with others and are deeply important for social interaction and fulfilling emotional relationships. Though they are flexible and can change with the presence of new information, early formed IWMs are believed to have lasting impacts on the expectations people have for themselves and others (Bowlby, 1969; Main, et al., 1985).

In Bowlby's conceptual model, IWMs influence and guide the behavior and expectations of the child in different situations. While he had a clear conceptualization of the functions assigned to IWMs (i.e., what they were intended to accomplish), he did not have a clear idea of how to explain their structure of the cognitive processes that underlie them. In developing his attachment model, he borrowed metaphors from cognitive psychology to help explain IWMs. Mental models (Craik, 1943) and schemas (Piaget & Inhelder, 1969) were two influential concepts. Mental models are a cognitive structure how the world functions and are used for decision-making, reasoning, and behavior (Craik, 1943). IWMs are essentially highly specific mental models. IWMs also function very much like Piaget and Inhelder's (1969) concept of schemas. In studying his own children from infancy, Piaget (1936) developed a stage theory of cognitive development. At the center of this theory is the idea of schema. Schemas are the cognitive framework an individual has about certain aspects of the world. For example, a child's schema for their mother could include her appearance, her voice, perhaps clothes she usually wears, how to reach her, and what the child can expect of her behavior in specific contexts (i.e., when they need comforting). Schemas are used to determine how an individual interacts with the world (Piaget, 1936). IWMs are essentially schemas. Both involve mental representations of people and situations that an individual can use to understand the world and decide how to behave. Both allow for individuals to learn about themselves and others and both can be changed with the acquisition of new information or experiences. In the case of attachment, IWMs are significantly impacted by the behavior of the attachment figure, which builds the foundations of the child's internalization of attachment.

Event Representations

Event representations and script theory offer another perspective for the structure of IWMs. Event representations refer to internal (mental) representations of events based on experience (Nelson, 1999). Nelson expanded upon script theory to help develop the notion of event representations. Script theory postulates that sequences of events in specific contexts are stored in memory as cognitive structures called scripts, which involve patterns of connection among neurons in different regions of the brain (Baldassano et al., 2018; Schank & Abelson, 1977). For example, a child's bedtime script might include brushing teeth, putting on pajamas, having the mother or father read a story, and then being tucked into bed for the night. In the case of very young children, the routines detailed in scripts provide a source of comfort and a feeling of security because they child can recognize the meaning of the event, even when it is incomplete, which fits well with attachment theory (Nelson, 1999). Event representations are the "raw material" from which children develop IWMs (Bretherton, 1985). Attachment security can also be assessed using event representations and knowledge of scripts (the secure base script), as detailed in later paragraphs.

Measuring Attachment Security

Attachment Security

Mary Ainsworth worked closely with John Bowlby and built on his theoretical framework of attachment through observation. Specifically, Ainsworth developed a procedure to observe attachment behaviors in real-time and the observed differences in attachment behavior during the procedure led her and colleagues to classify different categories of attachment relationships (Ainsworth & Wittig, 1969). The patterning and timing of attachment behaviors serves as the primary means of assessing the attachment bond. The Strange Situation Procedure

(SSP) is designed to activate the attachment system of infants between twelve and eighteen months old. The procedure highlights proximity seeking, exploration and use of secure base, safe haven, and separation protest. Classification of qualitatively distinct attachment relationships is based on differences in the patterning of these behaviors across the episodes of the SSP. The SSP is chiefly concerned with the infant's ability to use the attachment figure as a secure base from which to explore the novel environment and as a safe haven for comfort and security during a new experience. It includes a sequence of separations and reunions between a mother and her infant. The mother and infant play with toys in the same room as a research assistant (stranger), and the mother leaves the room for a short period of time before returning. The second separation involves both the mother and stranger leaving the room, upon which the stranger enters first and tries to engage the infant, and then the mother returns while the stranger slips out inconspicuously. The behavior of the infant during the two reunion episodes is the most important for classification of attachment style.

Ainsworth and her colleagues (1969, 1970, 1971, 1978) identified three distinct categories of attachment characterized by different patterns of behavior. Secure attachment is indicated by the infant's acknowledgement of the mother's return to the room, the ability of the mother to comfort the infant (if the infant has been distressed), and the infant's return to play after being comforted. Anxious/ambivalent attachment is indicated by marked distress at the separations, weak approach or failure to approach the mother when she returns, and inability or unwillingness to return to play after the reunions. Avoidant attachment is indicated by ignoring the mother's return, abbreviated approach behavior, or continuing to play without acknowledging the mother's return. A fourth style of attachment was later identified by Main and Solomon (1986). Disorganized attachment is characterized by odd behavior that resists classification by the original system. Disorganized attachment is often the product of abuse or neglect, although not in every case; alarming caregiving has also been associated with disorganized classification (Granqvist et al., 2017). The different categories of attachment relationships arise out of the differing experiences of infants with the caregiving behaviors of their mothers. Maternal sensitivity and availability, including cooperation with ongoing child behavior and acceptance, determine infants' expectations for their mothers' responses to their needs and builds the foundation of the infant's internal working models for their attachments to their mothers (Ainsworth et al., 1978). The infant's expectations are based on their experiences, which grounds the security of their attachment to their mother. A mother who is warm and who readily and reliably responds to her infant's communicative signals (of need) usually rears an infant with a secure attachment categorization. Mothers (caregivers) who are unwilling (e.g., because it is inconvenient or because they are unavailable) or unable (e.g., because they do not notice or tend to misinterpret their child's behavior) to respond appropriately and consistently to the child's communicative signals of need tend to rear infants/young children who are not securely attached.

Attachment security is based upon an infant's experiences with their primary attachment figure and is related to later social and emotional outcomes. Empirical evidence suggests attachment security can be relatively stable over time (Allen et al., 2004; Booth-LaForce & Roisman, 2021; Fraley & Dugan, 2021; Waters et al., 2000a). Secure attachment has been associated with increased social competence and engagement in preschool, better peer relationships, increased support-seeking in times of need, and higher self-esteem and self-efficacy (Mashburn & Pianta, 2006; Pallini et al., 2014; Posada et al., 2019; Rose-Krasnor et al., 1996; Schneider et al., 2001; Waters et al., 2000b; Waters & Sroufe, 1983). Cognitively, securely attached children perform better as well. They exhibit more effortful control (i.e., less impulsive and frustrated in the face of challenges; Hazen & Durrett, 1982; Matas et al., 1978; Nichols et al., 2019; Riksen-Walraven et al., 1993), have greater working memory capacity and inhibitory control (Bernier et al., 2015; Bernier et al., 2010), and are more attentive (i.e., in problem-solving; Arend et al., 1979). Insecure attachment has been associated with more anger and aggression in preschool and with internalizing problems such as social withdrawal, loneliness, and sadness (Booth et al., 1994; DeMulder et al., 2000; NICHD SECCYD, 2009; Sroufe et al., 1999).

Secure Base Scripts

The secure base script is a means of assessing components of IWMs. As mentioned above, Bowlby and other attachment researchers explored cognitive psychological concepts to understand the IWM construct. The focus became the internal life of individuals, grounded in their lived experiences and the goal became to assess IWMs (not hypothetical situations) in a measurable way. The Adult Attachment Interview (AAI; George et al., 1984) was developed from this idea. The AAI is a semi-structured interview designed to uncover autobiographical childhood memories to assess an adult's attachment relationship with their primary caregiver. The AAI generates information relevant to IWMs and the AAI was eventually extended to adolescents. Another measure that results in IWM-relevant information is the Attachment Story Completion Task (ASCT). Building upon Bowlby's IWMs and Nelson and Gruendel's (1986) event representations, Bretherton and colleagues (1990) developed the ASCT, which was designed to assess children's attachment categorizations aligning with Ainsworth's classification model.

The ASCT involves the construction of narratives through doll play, where a child is given a specific attachment-related story prompt and must tell the rest of the story. For example, with the Separation and Reunion prompts, the child is informed that the parent dolls are leaving for an overnight trip and the child dolls are staying home with their aunt. The child must complete the story and detail what happens after the parents leave and what happens after they return from their trip. The narratives in Bretherton's work were originally scored using a variety of scales (e.g., coherence, security, and emotional knowledge). Waters et al., 1998) used the Bretherton's ASCT vignettes (Bretherton et al, 1990) and proposed a novel scoring procedure for the narratives by comparing them to a fully articulated (i.e., ideal) secure base script narrative (the Attachment Script Assessment: ASA; see also Waters & Waters (2006). The key elements of the secure base script include an interrupting and/or dangerous event that stresses the child in the story, a bid for help, the caregiver identifying and responding to the bid for help, the help being accepted and effective at overcoming the distress, and the pair returning to normal activity. For example, in the Monster in the Bedroom prompt, the child doll hears a strange noise in their room at bedtime and calls for their parents. Ideally, the child being assessed would bring the parent dolls to the bedroom to investigate the noise, comfort the child doll, and get rid of the monster, or stay to protect the child against the monster's return, or demonstrate there was no monster. The temporal sequence and specificity of the responses as well as the inclusion of key secure base elements, determines the score for these narratives.

The secure base script describes an attachment representation in which the child expects the caregiver will be there to help when ongoing activities are disrupted and help to "restore the balance" to normal activities prior to the disturbance (Waters & Waters, 2006). A child's experience with secure base support from their caregiver(s) supports the construction of an event representation containing the secure base script (Waters & Waters, 2006). Children with more consistent experience with secure base support tend to provide a more complete, coherent, and easily accessible secure base script. The opposite is also true: children who have fewer opportunities to experience secure base support tend to produce stories that are inconsistent with the secure base script, and in extreme cases incompatible with the script (e.g., the child saves the parent in the monster in the bedroom narrative; Waters & Waters, 2006).

Waters et al. (1998) first evaluated the ASA with children at 37 and 54 months of age (these were the same participants from Bretherton et al., 1990). Children with more detailed and coherent stories had higher security scores, meaning these children had better access to the secure base script. There was a significant association between security scores across a 30-month time span, meaning secure base script access persists over time (Waters et al., 1998). In a subsequent study, Vaughn et al. (2006) tested mother's secure base scripts and reported significant rank-order stability over time. In general, the secure base script is at least moderately stable over time for adults. The secure base script has been assessed across cultures (Coppola et al., 2006; Fernandes et al., 2019; Nóblega et al., 2019; Shin, 2019) and with biological and adopted children (Veríssimo & Salvaterra, 2006). Secure base script scores are related to other measures of attachment, including the gold-standard Adult Attachment Interview and the Strange Situation (Dykas et al., 2006; Steele et al., 2014; Waters & Waters, 2006; Vaughn et al., 2006).

Other Variables

Just as attachment security measured using the SSP is related to later emotional and social functioning, secure base script access measured using the ASCT vignettes has been linked to those domains as well (Nichols et al., 2019). Children with access to the secure base script are more successful socially than their peers who do not demonstrate an access to the script. They have better rated teacher-child relationships (Vu, 2015), greater teacher-rated social competence (Posada et al., 2019), and greater peer rated social competence (Veríssimo et al., 2014).

Expanding upon the above findings, Nichols and colleagues assessed the relationship between secure base script scores and several domains of competence in early childhood, including executive functioning and social interaction. Secure base script was assessed using an adapted version of the ASCT narratives. Scripts were scored using a novel method proposed in Vaughn et al. (2019b; method described in detail below), which was modified from the Waters et al. (1998) scoring method. The scripts from three stories (Separation, Reunion, and Monster in the Bedroom) were assessed together to give a single composite security score. Higher security scores were related to better peer and teacher relationships and social competence, higher scores on a measure of receptive vocabulary, and effortful control (Fernandes et al., 2019; Nichols et al., 2019; Nóblega et al., 2019; Posada et al., 2019; Shin et al., 2019; Vaughn et al., 2019a; Waters, 2019). This demonstrates that the secure base script captures variance several domains of social and cognitive adaptation and contexts, resulting in better adaptive functioning in early childhood.

The Current Study

The purpose of the current study was to extend the design of Nichols et al. (2019) with the addition of (1) individual cases to Nichols' original dataset, (2) examining the longitudinal cases in new analyses, and (3) including two additional measures not examined in their study. I aimed to investigate how the relationships between SBS and the adaptive functioning variables differ from ages three to four and what role receptive vocabulary plays. Therefore:

Research Question 1 (RQ1): Does child age influence the relationship between SBS and each adaptive functioning variable?

Hypothesis 1 (H1): Concurrent SBS will positively predict social competence.

Hypothesis 2 (H2): Concurrent SBS will positively predict executive functioning.

Hypothesis 3 (H3): Concurrent SBS will positively predict effortful control.

Hypothesis 4 (H4): Concurrent SBS will positively predict teacher-child relationship qualities.

Research Question 2 (RQ2): Is SBS a mediator in the relationship between PPVT scores and the adaptive functioning variables?

Additionally, using the secure base script scores (SBS) from two time points I assessed the stability of SBS over time, as well as the relationship between longitudinal SBS and the measures of early childhood competence employed by Nichols and colleagues.

H1a: Time 1 SBS will positively predict Time 2 social competence.

H2a: Time 1 SBS will positively predict Time 2 executive functioning.

H3a: Time 1 SBS will positively predict Time 2 effortful control.

H4a: Time 1 SBS will positively predict Time 2 teacher-child relationship qualities.

Hypothesis 5 (H5): Time 2 SBS will be positively and significantly associated with Time 1 SBS.

The final component of this study included a replication of Nichols et al. using the exact analytic procedures outlined in their study and including an additional year of data.

Research Question 3 (RQ3): Does the addition of new cases to Nichols' data change the results of her analysis?

Method

Participants

The current study is an expansion of Nichols et al. (2019) with the inclusion of longitudinal data for some of the participants. Participants were recruited from twelve three-year-old classrooms and nine four-year old classrooms at an early learning center in the Southeastern region of the US. Data was collected across three academic years (2013/14-2015/16). The center is accredited by the National Association for the Education of Young Children (NAEYC). Data from 286 participants (54.5% male) were included in this study. Ages ranged from 31-59 months at the beginning of the academic year. There were 147 "younger" children, (31-47 months; M = 44.24, SD = 6.62) and 139 "older" children (48-59 months; M = 55.54, SD = 4.73). Age level was used as a grouping variable.

There were 79 longitudinal cases. The average age at Time 1 was 40.77 months (SD = 4.41) and 56.11 months at Time 2 (SD = 5.06). For the younger sample, most participants were boys (58.5%; 50.4% for the older sample). Approximately 60.5% of the participants were White, 18.4% were Black, and 6.8% were Asian or Latino or Hispanic (56.1%, 30.2%, and 6.5% respectively for the older sample). Race data was not available for all participants. For the longitudinal sample 54.4% of participants were boys, 72.2% were White, 22.8% were Black, and 5.1% were Asian, Latino, or Hispanic. Most families at this center could be classified as middle to upper-middle class based upon educational attainment and household income.

Measures

Attachment Story Completion Task

The ASA was administered by a female member of the research staff familiar to the participants. The children completed the task individually at the center's research laboratory. Together at a child-size table, she explained to the child they were going to play some games together. The child was informed that he/she would tell stories using the toys in front of him/her.

Toys included doll figures for the characters in the story and doll house pieces such as furniture, a car, and a pet stuffed dog. The dolls were matched to the child's ethnic background. The researcher introduced the doll characters and explained she would start the stories and the child would finish them. Four stories were used for the current study. The first story (Birthday Party) was a practice task to help the child become comfortable in the task and to assure that the child could generate a narrative about a familiar event. No participating child failed to complete the practice story. The researcher repeated the child's words to ensure the narrative was audible and understandable for transcription purposes. The children's stories were video recorded and transcribed by trained research assistants. Three stories (Separation, Reunion, and Monster in the Bedroom) were scored using the adapted coding system described in Vaughn et al. (2019b). Coders assigned a single score after reviewing all three narratives to summarize how the child accessed and used the secure base script. Scores ranged from 1 (odd or incoherent narratives that might include parentification, failure to protect the child, or addition of random/bizarre story elements) to 7 (complete narratives for both the Separation/Reunion and Monster in the Bedroom that indicated secure base and safe haven if/when needed). A score of 3 indicated a story without a secure base theme. The criteria for each of the scores are presented in Vaughn et al. (2019b). The interclass correlation (0.85) suggests that the SBS scores were reliable across raters.

Verbal Intelligence

Verbal intelligence was measured with the Peabody Picture Vocabulary Test (PPVT-IV: Dunn & Dunn, 2007). This task involves image plates with four drawings, one of which best describes the given vocabulary word. The participant is asked to identify the drawing that corresponds to the vocabulary word. No reading or writing are required. This measure has been established to have rate of internal consistency around 0.89-0.97 (Dunn & Dunn, 2007). The

PPVT-IV was administered by an experienced researcher in a quiet area away from the classroom. The age-adjusted standard score was used as an index of receptive vocabulary capacity.

Social Competence (SC)

Four measures (two each taken from two different instruments) were used to assess social competence. The first were Q-sort summary profiles of behavior/personality to provide scores for SC. The second was Peer Acceptance scored from two sociometric tasks.

Profiles of Behavior/Personality

Teams of two Q-sort observers spent 20 hours individually observing the children in each classroom. Observers noted the behaviors and attributes of individual children across several different days and activity settings (e.g., small group-play, snack time, outdoor play). Each observer described all children with the California Child Q-sort (CCQ: Block & Block, 1980; 100 items) and the Bronson revision of the Preschool Q-sort (PQ: Baumrind, 1968; 72 items). Children absent from more than half of the observation hours were not described by the observer. The Q-sorts were sorted using rectangular distributions with equal numbers of items (9 piles of 11 for the CCQ, with the middle pile having 12 items, and 9 piles of 8 items for the PQ). Q-sorts were averaged across the two sorters and standardized within classrooms.

Peer Acceptance

Peer acceptance was measured using two sociometric tasks: peer nomination and paired comparisons. Participants were interviewed outside the classroom in a quiet area. Positive and negative nominations were generated for the nomination task (McCandless & Marshall, 1957). Each child was shown a set of randomly mixed photographs of his or her classmates and was asked to choose three peers he or she especially liked and three he or she did not especially like.

Nominated photographs were turned facedown. Scores were determined by calculating the total number of times a child was chosen by peers in both the positive and negative assessments.

For the paired comparisons task, participants were presented with pairs of photographs of their classmates and were asked to select the child they especially liked (Vaughn & Waters, 1981. Following conventions for sociometric data, paired comparisons and positive nominations (peer acceptance) were standardized (z-scores) within classrooms to make them comparable in terms of means and standard deviations.

Teacher-Rated SC

Teacher-rated social competence was measured using the Penn Interactive Peer Play Scale (PIPPS: Fantuzzo & Hampton, 2000) and the short form of the Social Competence and Behavior Evaluation Scale (SCBE-30: LaFreniere & Dumas, 1996). The PIPPS consists of 32 items assessing the frequency of different social behaviors during playtime with peers (e.g., “Shares toys with other children;”). Three subscales were used for this study: play interaction (i.e., cooperative and helpful behaviors; $\alpha = 0.55$), play disruption (i.e., aggressive and antisocial behaviors; $\alpha = 0.93$), and play disconnection (i.e., withdrawn and avoidant behaviors; $\alpha = 0.92$). The reliability obtained in the current study matches well with reliability obtained from validation studies with the exception of play interaction, (interaction: $\alpha = 0.90$; disruption: $\alpha = 0.91$; disconnection: $\alpha = 0.87$; Fantuzzo et al., 1995). Responses are made on a four-point Likert-type scale ranging from 1 (never) to 4 (always). Higher scores on play interaction indicate greater SC, while high scores on disruption and disconnection indicate lower SC. A composite variable was created for the PIPPS subscales and play interaction was reverse-scored so higher scores indicated less interaction. This composite variable was a proxy measure for antisocial behavior.

The SCBE-30 consists of 30 items split evenly between three subscales: social competence, anxiety/withdrawal, and anger/aggression. Only the SC subscale was used for this study. The SC subscale assesses the child's social qualities (e.g., "Accepts reasonable compromises;" $\alpha = 0.82$). The reliability obtained for the current study matches well with values obtained from the original researchers ($\alpha = 0.80\text{-}0.92$). Responses are made on a six-point Likert-type scale ranging from 1 (never) to 6 (always). Higher scores indicate greater SC. Means scores were used for these measures.

Executive Function

Executive function was measured using seven tasks from Espy (1997; Shape School, Delayed Alternation), Simpson and Riggs (2006; Go/No-Go), Diamond et al. (1997; Nine Boxes), and Wiebe et al. (2011; Big-Little Stroop, Snack Delay, Nebraska Barnyard) These tasks were administered to each child individually in the laboratory playroom, through instruction with the researcher or a computer. Inhibitory control was assessed with Shape School, Big-Little Stroop, Go/No-Go, and Snack Delay. Working memory was assessed with the Delayed Alternation, Nine Boxes, and Nebraska Barnyard tasks.

Inhibitory Control

A computer with E-Prime 2 software (Psychology Software Tools, Pittsburgh, PA, USA) was used for Shape School and Delayed Alternation. For Shape School, children named the color of a cartoon face during inhibition and non-inhibition trials. If the cartoon had a happy face, they reported the color name but if the cartoon had a sad face, they were silent. There were twelve practice trials with neutral-faced cartoons. In the test phases, six inhibition (sad faces) and twelve non-inhibition (happy faces) trials were administered. The percentage of correct suppression responses were scored.

Big-Little Stroop and Go/No-Go were conducted using the E-Prime software as well. For the Big-Little Stroop task, participants were presented with pictures of everyday objects which contained smaller embedded objects. The embedded objects either matched or conflicted with the category of the larger objects. In the training phase, the children named the pictures on the screen. In the test phase, trials started with showing the larger object followed by the embedded object. Participants had to name the smaller objects shown on the screen, rather than the larger objects. Twenty-four test trials were conducted. In the inhibition trials (50%), the smaller object did not match the category of the larger object. A greater proportion of correct responses on the inhibition trials indicated greater executive functioning.

For Go/No-Go, children were instructed to press the spacebar when they saw pictures of fish on the screen (75% of the trials were non-inhibition). For inhibition trials, the children had to keep from pressing the spacebar when they saw pictures of sharks (25% of trials). If the children pressed the response key during an inhibition trial (when a shark came on the screen), a broken fishing net appeared. Each trial lasted 1500-ms., with 1500-ms. intervals. The dependent variable for the Go/No-Go task was the d prime statistic (*z*-score difference between the correct hit rate and the incorrect hit rate).

For Snack Delay, children were instructed to remain silent and sit with their hands on two handprints on a placemat. A bowl of snacks – snack type was determined by child preference and included raisins or animal crackers – was placed in front of the child. The researcher instructed the child to wait to eat the snack until they were given a signal. For a 240-second period, the researcher gave distractions like coughing and left the room for 90-seconds toward the end of the delay period. This task was video recorded and split into 30-second intervals. Children received one point each for the three behaviors (staying silent, sitting still, keeping hands on the mat) during each interval. Summary scores were used for this measure to indicate inhibitory control.

Working Memory

For Delayed Alternation, children were presented with two identical cups and were tasked with selecting the cup with a small animal figure under it. If the cup selected contained the figure, the figure was placed under the other cup in the next round (switching occurred behind a screen, out of the child's view). To correctly pick the figure, the child had to alternate between the left and right cups. There was a 10-second delay between rounds, where the researcher asked distracting questions to the child (e.g., "What is your favorite color?"). The task consisted of up to sixteen rounds. If the child got nine rounds in a row correct, the task ended and they got credit for the remaining five rounds, if not, the task continued for the total sixteen rounds. The maximum number of correct responses was subtracted from the maximum number of incorrect responses to create the score for this task.

For Nine Boxes, children were presented with a row of nine colored boxes with different shaped lids (square, heart, oval). They were tasked with finding animal figures hidden in the boxes. Children could open one box per round and the boxes were shuffled behind a screen after each round (shuffling occurred during a 15-second delay between rounds). The child had to get all the animal figures, or the task was ended after five consecutive errors. The score for this task was the largest number of consecutive correct retrievals.

The Nebraska Barnyard (Animal Sounds) task was used to measure working memory. In this task, the child had to remember a sequence of animal names and recall the sequence by choosing the correct pictures on the screen. Participants were presented with nine colored animal pictures on the screen that produced an animal sound when clicked in the training phase; they were required to identify each animal. All participants passed the training phase. The animal pictures were replaced with solid-colored pictures in the testing phase. The solid color matched the previous animal picture (e.g., a yellow lion had a yellow picture). For the first nine trials, the child clicked the correct picture after examiner named the animal. Then, trials with sequences of animals were given, starting with sequences of two and increasing incrementally. As many as three trials were administered. The third trial was skipped if the first two were correct, but if all three trials were incorrect, the task ended. A summary score was calculated for each participant by averaging the number of correct responses and summing the averages across the number of trials completed.

Effortful Control

Effortful control was assessed using teacher-reports on the short form of the Child Behavior Questionnaire (CBQ-SF; Putnam & Rothbart, 2006). The CBQ-SF (consisting of 94 items with 15 subscales) examines child temperament (reactivity and regulation), for children between three and seven years old. The overall reliability for the measure ranges from 0.43 to 0.87 (Putnam & Rothbart, 2006). This study employed three subscales to create an effortful control composite score (Rothbart, 2007; Rothbart et al., 2001; Viddal et al., 2015). The subscales included low-intensity pleasure (i.e., ability to experience pleasure from low intensity activities; 13 items; $\alpha = 0.92$), inhibitory control (i.e., ability to suppress inappropriate reactions and plan future actions; 13 items; $\alpha = 0.87$), and attentional control (i.e., ability to focus and shift attention; 14 items; $\alpha = 0.84$). Greater scores indicate greater effortful control. A composite variable was created from the subscales to form an effortful control variable ($\alpha = 0.87$).

Teacher-Child Closeness/Conflict

The Student-Teacher Relationship Scale (STRS; Pianta, 2001) was used to assess teacher-child closeness and conflict. The STRS measures teacher-perceived closeness and conflict in the relationships with individual students. Closeness was measured with eight items (e.g., “I share an affectionate, warm relationship with this child;” $\alpha = 0.92$). Conflict was measured using seven items (e.g., “This child and I always seem to be struggling with each other;” $\alpha = 0.64$). Reliability for the current study matched well with the established value for the closeness subscale ($\alpha = 0.86$) but not for the conflict subscale ($\alpha = 0.92$). Responses are rated on a five-point Likert-type scale from 1 (definitely does not apply) to 5 (definitely applies), with higher scores indicating greater closeness and conflict, respectively. Mean scores were used for this measure.

Analytic Plan

Determining the Analytic Sample

All three- and four-year-old participants were included in the age-level analyses. This is the cross-sectional sample. All longitudinal cases are included in this cross-sectional sample, with their Time 1 data (earliest data collection period) in the younger cohort, while their Time 2 data (latest data collection period) included in the older cohort. The longitudinal sample included all children who were assessed twice during the three years of data collection.

Plan of Analysis

A preliminary analysis was conducted with demographic variables. All demographic variables were examined as categorical, including age (older vs. younger), though variable correlations with chronological age were included to determine if there were within age cohort differences for the two discrete age-levels. Correlation analyses were conducted to address H5. A factor analysis was used to determine overarching adaptive functioning constructs. These factors were used in the various path analyses to address H1-H4 and RQ1-RQ3 using the cross-sectional sample. H1a-H4a were addressed through path analyses using the longitudinal sample.

Preliminary analyses were conducted using SPSS 27, including the factor analysis. All path analyses were conducted using the “lavaan” package in R, as was the confirmatory factor analysis used to recreate the latent variables from Nichols et al., which was then used to test the replicability of her findings.

Results

Preliminary Analyses

Cross-Sectional

Demographic associations and differences. Descriptive statistics and demographic variable correlations are presented in Tables 1 and 2. For younger children, sex was significantly associated with four executive functioning variables, teacher closeness and conflict, effortful control, and antisocial behavior, with girls achieving higher scores for the executive functioning variables, having higher effortful control scores, higher teacher closeness ratings, and lower teacher conflict and antisocial behavior ratings. Age in months was significantly associated with five executive functioning variables and social competence, with older children (in the younger cohort) performing better and having lower teacher-rated social competence. Ethnicity was not significantly associated with any variables among younger children. For older children, sex was significantly associated with SBS, effortful control, teacher closeness, teacher-rated social competence, and antisocial behavior. Girls had higher SBS scores, higher effortful control scores, higher teacher-child closeness, higher teacher-rated social competence scores, and lower antisocial behavior ratings. Age was significantly associated with three executive functioning variables and social competence, with older children (among the older cohort) performing better and having lower teacher-rated social competence. Ethnicity was significantly associated with one executive functioning variable, average paired comparisons, and the Q-sort social competence composite, with non-White children having lower scores for the Nine Boxes task, being chosen less in the paired comparison, and having lower Q-sort social competence scores.

To compare mean differences across age group and ensure independence of samples, one time point each from the 79 longitudinal cases was randomly selected to be retained in the dataset and the other time point was removed. An independent sample t-test comparing the mean scores for children in the younger cohort vs. children in the older cohort revealed significant differences for Delayed Alternation ($t(180) = 3.00$, $p = .003$), Animal Sounds ($t(110) = 6.50$, $p < .001$), Big-Little Stroop ($t(110) = 4.48$, $p < .001$), Go-No-Go ($t(112) = 4.89$, $p < .001$), effortful control ($t(186) = 2.16$, $p = .032$), social competence ($t(188) = 4.06$, $p < .001$), teacher-child closeness ($t(188) = 2.03$, $p = .043$, antisocial behavior ($t(188) = -6.78$, $p < .001$), and teacher-child conflict ($t(188) = -3.42$, $p = .001$). Older children had better performance on the executive functioning measures and had greater effortful control, teacher-rated social competence, and teacher-child closeness, and lower antisocial behavior and teacher-child conflict ratings.

Significant mean differences were also found regarding sex (boys coded as “0” girls as “1”) for Snack Delay ($t(93) = 2.08$, $p = .040$), Shape School ($t(43) = 2.41$, $p = .020$), effortful control ($t(93) = 3.27$, $p = .002$), teacher-child closeness ($t(95) = 2.91$, $p = .005$), teacher-child conflict ($t(95) =- 3.06$, $p = .003$), and antisocial behavior ($t(95) = -2.87$, $p = .005$), for younger children. For the older children, SBS ($t(74) = 4.04$, $p < .001$), effortful control ($t(91) = 3.85$, $p < .001$), teacher-rated social competence ($t(91) = 2.54$, $p = .013$, antisocial behavior ($t(91) = -2.06$, $p = .042$), and teacher-child closeness ($t(91) = 2.14$, $p = .035$). Essentially, younger girls were more advanced than boys with regard to executive functioning and both younger and older girls had greater effortful control. Interestingly, teachers reported being both closer with girls and having more conflict with them, across age group, as well as viewing girls as simultaneously more socially competent and exhibiting more antisocial behavior.

These preliminary analyses reveal some of the expected differences in adaptive functioning in early childhood. Four-year-olds on average have more advanced functioning than three-year-olds, both for performance variables and teachers' ratings. Additionally, girls tend to be more advanced than boys, especially with regard to social functioning. Interestingly, when examining age in months within the cohorts, older children had better executive functioning, but had lower teacher-rated social competence. When age level was used as a grouping variable, examining the relation between the adaptive functioning variables and chronological age offered additional information. There is no theoretical reason why the older children in each cohort would be viewed as less socially competent by their teachers.

Performance variable associations. Correlations among the adaptive functioning variables are found in Tables 3 and 4. For younger children, SBS was significantly related to PPVT, two executive functioning variables, teacher-child closeness, and the Q-sort social competence. PPVT was significantly related to these constructs as well. PPVT was also significantly related to the paired comparisons sociometric score. For older children, SBS was significantly related to the peer acceptance sociometric measures. SBS was also significantly related to five executive functioning variables, effortful control, and antisocial behavior, as were PPVT scores. PPVT was also significantly related to teacher-child closeness and the Q-sort social competence.

There were no significant differences between mean scores on measures for unique cases (i.e., children seen on only one assessment occasion) and longitudinal cases for the SBS or the PPVT. Differences were found for several of the executive function variables (i.e., Delayed Alternation ($t(177) = -2.84$, $p = .005$), Nine Boxes ($t(175) = -2.61$, $p = .010$), and effortful control ($t(182) = -2.31$, $p = .022$), with longitudinal cases having higher means, and Go-No-Go ($t(112) = 2.53$, $p = .013$), with unique cases having higher means. These findings suggest that longitudinal and unique cases were more similar than different with regard to the variables studied. More importantly, the results indicate that longitudinal and non-longitudinal cases did not differ with regard to SBS and PPVT.

Longitudinal

The longitudinal cases represent a subset of the cross-sectional cases ($n = 79$). These participants were assessed once between ages three and four, and again between the ages of four and five. Because the longitudinal cases were a subset from the cross-sectional analysis, it was expected that the findings regarding Time 1 and Time 2 measure differences would parallel the results of the younger vs. older cohorts detailed in the cross-sectional analyses above. The primary goal of the longitudinal analyses was to assess the stability of the SBS over time and investigate the predictive power of Time 1 SBS on Time 2 adaptive functioning.

Descriptive statistics for the longitudinal cases are presented in Table 5. Paired t-tests comparing mean scores at Time 1 and Time 2 revealed significant differences for SBS ($t(54) = -3.55$, $p = .001$), Delayed Alternation ($t(65) = -4.89$, $p < .001$), Animal Sounds ($t(31) = 7.51$, $p < .001$), Big-Little Stroop ($t(32) = 3.62$, $p < .001$), Snack Delay ($t(63) = -3.36$, $p < .001$), effortful control ($t(68) = -5.57$, $p < .001$), and antisocial behavior ($t(68) = 8.79$, $p < .001$). Negative t-values indicate Time 2 scores were higher than at Time 1, while positive t-values indicated Time

2 scores were lower. SBS score increased with age, as did effortful control. The findings regarding the executive functioning variables are mixed (i.e., with younger children having higher scores for some variables). However, this may be due to the fact that over half of the cases were missing Time 2 assessments for Animal Sounds, Shape School, Big- Little Stroop, and Go-No-Go: (*n* = 40 for all).[1]

Correlations among measures at Time 1 and Time 2 are presented in Table 6, while across time correlations are presented in Table 7 and within time correlations in Tables 8 and 9. Hypothesis 5, that Time 2 SBS would be positively and significantly associated with Time 1 SBS was supported ($r(55) = 0.31$, $p = .02$). Time 1 SBS was also positively and significantly related to Time 1 PPVT, two executive functioning measures, teacher-rated social competence, teacher-child closeness, and the Q-sort social competence score, and negatively to teacher-child conflict. Time 2 SBS was only significantly related to positive peer nominations. These findings do not parallel the correlations between SBS and the adaptive functioning measures for the younger and older cohorts, but this may be due to the reduced sample size (the longitudinal sample was just over half the size of each younger and older cohort; $n = 79$ vs. $n = 135$) and the fact that 24 cases with Time 1 SBS scores were missing Time 2 SBS scores (~ 30% of the sample).

There was a significant difference between the average SBS score at Times 1 and 2 and there was a significant positive correlation between the scores despite over 30% missing cases at Time 2. The difference between Time 1 and Time 2 scores was modest ($M = 0.51$, $SD = 1.06$, or ~ half an SD). This result indicates that SBS scores are significantly but only moderately stable from age three to age four in this sample.

[1] The researcher collecting the executive functioning measures at Time 2 left during the data collection period and there was not time to find a replacement to use the E Prime protocol. The Time 2 executive functioning measures collected during that period utilized observation (e.g., Nine Boxes, Snack Delay).

Testing the Predictive Power of the Secure Base Script

Factor Creation

An exploratory factor analysis was conducted to group the adaptive functioning variables. Teacher-child conflict was reverse-scored so higher scores indicated lower conflict in order to capture a positive teacher-child relationship. Because teacher-child closeness and conflict are highly correlated with other adaptive functioning variables rated by teachers, they were placed in a separate factor analysis. This method was used rather than creating a composite score so that I could use a factor score for the TCR variables in subsequent analyses.

Because a considerable amount of data was missing, values were imputed using the Markov Chain Monte Carlo approach (Metropolis & Ulam, 1949). Five imputed values were generated for each missing data value and the factor analysis was run across those five imputed datasets. Separate factor analyses with Varimax rotation were run for the younger and older cohorts. Variables with poor loadings (highest loading < .40) and/or that had loadings > .4 on multiple factors were removed until four factors emerged: Social Competence (SC), Inhibitory Control (IC), Working Memory (WM), and Positive Teacher-Child Relationship (TCR). Q-sort social competence, positive nominations, and Animal Sounds were removed.[2] The Q-sort is a broad-band measure of behavior and personality, so it is unsurprising that it loaded across multiple factors. Sociometric measures (e.g., positive nominations) are also influenced by

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[2] Because the Q-sort social competence and positive nominations were important measures of social competence, separate regressions were run with SBS as a predictor. Positive nominations and paired comparisons were averaged to create a peer acceptance composite and the Q-sort represented observed socially competent behavior. See Table 23 for the younger cohort regression model and Table 24 for the older cohort. SBS significantly predicted observer-rated social competence for younger children (R^2 = .277, $F(1, 119) = 9.88$, p = .002) but not older children. SBS significantly predicted peer acceptance for older children (R^2 = .293, $F(1, 99) = 6.37$, p = .003) but not younger children. These analyses reveal that SBS plays an important role in observers' perceptions of the social competence of the three-year-olds in this sample, while SBS plays an important role in in peer acceptance of the four-year-olds in this sample. PPVT was not a significant predictor of either observer-rated social competence or peer acceptance.

multiple domains. The remaining variables loaded on the same factors for both younger and older children. Factor loadings are presented in Table 10 (younger) and Table 11 (older).

Factor correlations are presented in Tables 12 and 13 for the younger and older cohorts respectively. Factor correlations for the longitudinal cases are presented in Table 14 (Time 1), Table 15 (Time 2) and Table 16 (Across Time). Among younger children SBS was only significantly associated with TCR ($r(149) = .16$, $p = .04$), while SBS was significantly associated with SC ($r(139) = .23$, $p = .007$) , IC ($r(139) = .37$, $p < .001$), and TCR ($r(139) = .17$, $p = .04$) for older children. An r to z transformation to test the difference between the correlations found no significant differences between the younger and older cohorts. It does not appear that SBS is more related to adaptive functioning for older children, despite the greater number of significant correlations. Among the longitudinal cases, Time 1 SBS was significantly associated with Time 1 WM ($r(79) = .31$, $p = .006$) and TCR ($r(79) = .39$, $p < .001$), and Time 2 SC ($r(79) = .24$, $p = .04$). Time 2 SBS was significantly associated with Time 2 IC ($r(79) = .23$, $p = .045$) only, and Time 1 SC ($r(79) = .24$, $p = .04$). An *r* to *z* transformation of the Time 1 and Time 2 correlations revealed only a significant difference in the correlation between SBS and TCR ($z = 2.29$, $p = .022$), with the Time 1 correlation being significantly higher. It appears that over time, SBS becomes less related to a positive teacher-child relationship in early childhood, which contradict the results obtained from the cross-sectional sample. However, this may be due to the smaller size of the longitudinal sample. No significant differences were found between the cross-sectional correlations and the longitudinal correlations using *r* to *z* transformations.

Model Specification

Three path analyses were conducted using the cross-sectional data. Age was a moderator in each model. Sex was entered into each model as a control variable and then fixed to a value of one. This was done to generate degrees of freedom necessary for the models to converge. Without fixing sex, the models would not have converged (i.e., would have had zero degrees of freedom) and model fit statistics would not be interpretable.

Model Results

Cross-Sectional. It was expected that SBS would positively predict each adaptive functioning variable (Hypotheses 1-4). Because effortful control loaded on the social competence factor, H1 and H3 will be assessed together. The first model addressed these hypotheses and whether child age influenced the relationship between SBS and adaptive functioning (RQ1), The first model included SBS as a predictor of the four factors with age group (older vs. younger) as a moderator, while controlling for sex. This model was an acceptable fit for the data (χ^2 = 13.63, *df* = 7, *p* = .06; CFI = .97; RMSEA = .08). Model results are detailed in Table 17 and illustrated in Figure 1. SBS significantly predicted teacher-rated SC (R^2 = .064, β = 0.091, p = .02) and IC (R^2 = .145, *β* = 0.334, *p* < .001) only for older children, and TCR (R^2 = .042, *β* = 0.161, *p* = .05) only for younger children. H1-H4 were partially supported. SBS significantly predicted some measures of adaptive functioning in early childhood, and these association tended to be greater for four-year-olds than three-year-olds.

The second model added PPVT as a predictor. The model fit was acceptable (χ^2 = 13.55, *df* = 7, *p* = .06; CFI = .97; RMSEA = .08). As shown in Table 18 and illustrated in Figure 2, with the addition of PPVT, SBS only significantly predicted IC for both younger (*β* = 0.165, *p* = .04) and older children (*β* = 0.295, *p* < .001). All other direct effects of SBS on adaptive functioning were reduced and no longer significant. PPVT significantly predicted SC (*β* = 0.177, *p* = .03), IC (*β* = 0. 175, *p* = .03), and TCR (*β* = 0.194, *p* = .02) for older children and WM for both younger (*β* = 0.171, *p* = .03) and older children (*β* = 0.244, *p* = .003). SBS and PPVT together explained

9.3% of variance in SC, 17.4% in IC, 8.5% in WM, and 7.8% in TCR in younger children and 3.9% (SC), 4.8% (IC), 10.0% (WM), and 5.1% (TCR) in older children. The results from this model suggest that receptive vocabulary (measured by PPVT) is more predictive of early childhood adaptive functioning than SBS.

The final model included SBS as a mediator in the relationship between PPVT and the adaptive functioning outcome factors. The model fit was acceptable (χ^2 = 18.37, *df* = 9, *p* = .03; CFI = .96; RMSEA = .09). This model addressed RQ2, which explored whether receptive vocabulary (PPVT) influenced the relationship between SBS and the adaptive functioning variables. Receptive vocabulary influences SBS, because part of the SBS scoring is dependent upon narrative complexity and coherence: greater receptive vocabulary lends itself to more complex and coherent attachment narratives. Model results are reported in Table 19 and illustrated in Figure 3. As expected PPVT significantly predicted SBS for both younger (β = 0.229, *p* = .004) and older children (β = 0.218, *p* = .008), which in turn significantly predicted IC for both age groups (younger: β = 0.165, *p* = .42; older: β = 0.288, *p* < .001). The only significant indirect effect was found for PPVT predicting IC through SBS (β = 0.063, *p* = .03), and this was only for older children. This model explained 8.9% of variance in SC, 16.3% in IC, 9.3% in WM, and 7.6% in TCR in younger children and 4.2% (SC), 5.2% (IC), 11.1% (WM), and 5.5% (TCR) in older children. It does not appear that PPVT significantly influences the relationship between SBS and adaptive functioning in the preschool years except for inhibitory control. Possible explanations for this finding are discussed in the next section of this thesis.

Longitudinal. According to hypotheses 1a-4a, it was expected that Time 1 SBS would predict Time 2 adaptive functioning. The longitudinal path analysis included Time 1 SBS as a predictor of Time 2 adaptive functioning, while controlling for sex. Model results are reported in

Table 20 and illustrated in Figure 4 show that Time 1 SBS did not significantly predict Time 2 adaptive functioning, therefore Hypotheses 1a-4a were not supported. It does not appear that Time 1 SBS was a significant predictor of subsequent adaptive functioning in this sample of young children. The model including Time 2 SBS as a mediator was nonsignificant as well. See Table 25 for model results.

Replicating Nichols et al.

Nichols et al. (2019) used latent variable analysis to construct her adaptive functioning variables, while factor analysis was used in this study. To address whether the addition of new cases to Nichols et al.'s data would change her results (RQ3), For this study, her latent variable analysis was replicated using a confirmatory factor analysis in R. The dataset used for this replication included all the cases used by Nichols with the addition of cases from the third year of the project. See Table 21 for factor loadings. I included the measures she removed from her analysis (paired comparisons, Snack Delay, Nine Boxes, and the CBQ inhibitory control subscale) and found that they loaded sufficiently onto my factors. The factors created through this analysis were Social Competence, Executive Functioning, Teacher-Child Relations, and Effortful Control.

The model specified in Nichols et al. (2019) is presented in Figure 5. One final path analysis was conducted predicting the adaptive functioning latent variables from SBS, while controlling for PPVT, to replicate Nichols' analysis. This model had an acceptable fit for the data (χ^2 = 19.34, df = 4, p = .001; CFI = .966; RMSEA = .136). As shown in Table 22, SBS significantly predicted Social Competence (β = 0.233, p = .001), Teacher-Child Relations (β = 0.264, p < .001), and Effortful Control (β = 0.254, p < .001), but not Executive Functioning. SBS and PPVT together predicted 5.2% of the variance in Social Competence, 0.7% in Executive

Functioning, 7.4% in Teacher-Child Relationship, and 7.3% in Effortful Control. The addition of new cases partially replicated Nichols et al.'s results.

Discussion

The goal of this study was to examine the relations between the secure base script and adaptive functioning in early childhood and the stability of the secure base script over time. The domains of adaptive functioning included social competence, executive functioning (comprised of measures of inhibitory control and working memory), effortful control, and teacher-child relations. The secure base script was correlated with many of the variables measuring these domains. Age also played a role, with some of the correlations differing depending on age cohort (younger vs. older). Cross-sectional and longitudinal analyses were conducted to address the above research questions.

The role of SBS in adaptive functioning was assessed through path analysis. Multiple models were tested to address the role of SBS, receptive vocabulary, and age in the adaptive functioning domains specified through factor analysis. It was discovered that all three constructs influenced adaptive functioning in this preschool sample in various ways.

Influences on Preschool Adaptive Functioning

Secure Base Script

The secure base script predicted teacher-rated SC and IC (one component of executive functioning) in the older cohort and TCR in the younger cohort. SBS has been previously associated with social competence (Posada et al., 2019; Veríssimo et al., 2014) and executive functioning (Nichols et al., 2019; Waters, 2019). This study offers additional support for the notion that internal working models of attachment, as measured by the child's access to the SBS while narrating attachment-relevant stories, are related to domains of adaptive functioning in the preschool context. The SBS score had more significant correlates with adaptive functioning scores with the older cohort, but the magnitudes of these associations were not significantly different from associations in the younger sample. It may be that positive developmental changes in cognition (e.g., verbal ability, executive function, effortful control) over the preschool years enable the child to organize and integrate the SBS in their attachment-relevant narratives, accounting for the increased coherence in the cross-dimension associations. Even so, SBS alone explained a moderate amount of the variance in adaptive functioning across ages three and four.

Secure Base Script Influence Across Time. Although Time 1 SBS had significant concurrent correlations with measures of adaptive functioning and was significantly associated with Time 2 SBS, it did not significantly predict the other measures of adaptive functioning at Time 2, even before accounting for control variables (sex, PPVT). For this sample, Time 1 SBS did not contribute significantly to the subsequent organization of adaptive functioning, even though Time 1 SBS did have significant associations with Time 2 adaptive functioning. Additionally, effects were not mediated through Time 2 SBS. This may reflect the reduced size of the longitudinal sample but may also reflect normative changes in the way SBS intersects with the other measured domains of adaptive functioning. More research with larger longitudinal samples will be needed to address these issues.

PPVT

Receptive vocabulary plays a role in a child’s ability to create a coherent and cohesive secure base script narrative (Vaughn et al., 2019a) and in the domains of adaptive functioning (evidenced in correlations between PPVT and various adaptive functioning measures). Therefore, it can be assumed like SBS, receptive vocabulary plays a role in supporting adaptive functioning in domains such as EF and effortful control. PPVT scores were significantly associated with SC, IC, and TCR for older children and with WM for both younger and older children. The inclusion of PPVT reduced all direct effects of SBS on adaptive functioning with the exception of IC. It appears that receptive vocabulary has more predictive power for adaptive functioning than SBS. SBS and PPVT together explained a moderate amount of variance in adaptive functioning. When SBS is introduced as a mediator in the relations between PPVT and adaptive functioning, it significantly predicted IC through PPVT for older children. Inhibitory control is a proxy measure for self-regulation (Montroy et al., 2016) and has long been associated with measures of secure attachment (Bernier et al., 2015; Bernier et al., 2010). The finding from this study supports the notion that children with secure attachments are better able to use their behavioral and affective resources for impulse control than children with more insecure attachments. For this particular study, the indirect effect of SBS through PPVT on IC hints at the use of language as a support in the task of self-control.

Secure Base Script Stability

Consistent with previous research supporting the stability of SBS (Waters et al., 1998), the SBS was significantly stable in this sample. Significant differences between average SBS scores at age three and four were found for the longitudinal sample and the correlation between the scores was significant, albeit moderate. Additionally, the average difference score was relatively small (~half a SD). Statistically, there was an improvement in SBS scores across time, however, an average increase of a half point may not have practical significance. For this sample, SBS appears to be moderately stable. This stability lends credence to the notion of the SBS as an important approach to addressing internal working models of attachment, which Bowlby (1969) believed to be relatively stable across development.

Replicating Nichols et al. (2019)

The final aim of this study was to replicate the design of Nichols et al. (2019) and determine whether the addition of new cases changed the results obtained from their study. When following the procedure detailed by Nichols as closely as possible, Nichols' results were partially replicated with the addition of new cases. SBS significantly predicted Social Competence, Effortful Control, and Teacher-Child Relations, but did not significantly predict Executive Functioning. In the path analyses using the factor analysis approach, SBS was a significant predictor of inhibitory control, which is an aspect of executive functioning. The results from Nichols et al. were largely replicated with the addition of new cases.

Strengths

One major strength of this study is the use of the SBS, which is a well validated measure of attachment representations (Coppola et al., 2006; Fernandes et al., 2019; Nichols et al., 2019; Nóblega et al., 2019; Posada & Waters, 2018; Shin, 2019 ; Veríssimo & Salvaterra, 2006; Waters, Rodrigues, & Ridgeway, 1998). This study addresses the degree of stability in attachment measurement in early childhood, which is important data, given the prominence of attachment stability as a criterion for validity in attachment research. Most measures of attachment are tested across time to examine whether and how they change over the life course; it is therefore useful for SBS to be tested as well. These results reinforce the notion that while attachment measures show significant stability over time, they are not necessarily fixed at any given developmental period.

Another strength is the diverse use of measures of adaptive functioning. This includes the use of multiple informants for social competence (peers, teachers, and independent observers). The use of multiple informants ensures that social adaptation in the peer group was measured in a variety of relevant ways in order to give a more generalizable representation of each child's competence in the preschool context. Executive functioning was also measured using performance (i.e., objective) measures that did not require judgement from the researcher. The use of multiple diverse measures allowed for a broad characterization of adaptive functioning. These findings support the interpretation of attachment as an organizing dimension for development, that influences activity within other behavioral and cognitive domains throughout early childhood.

A final strength of this study concerns our extension of the results by Nichols et al. (2019) by increasing the sample size and by examining both age level differences in patterns of associations among the variables and cross age longitudinal relations among the variables examined in the Nichols et al. study. The findings reported here are generally supportive of the conclusions reached in the Nichols et al. study insofar as the secure base script is properly seen as a measure of an organizational attachment construct during early childhood, but specific organizational influences on adaptive functioning may be different for younger vs. older preschool children (and even for a given child at different age levels).

Limitations

One major limitation with this study was the amount of missing data. More than half of the cases from the third year of data collection were missing executive functioning scores for three measures and over 30% of cases were missing Time 2 SBS scores in the longitudinal sample. This meant that more data needed to be imputed. While the data imputation method is used widely in the field (Jones & Qin, 2022), it is always better to have actual scores in order to get the most accurate picture of the relationships between variables and best represent the population of interest.

Another limitation is the representativeness of sample. The sample is not representative of the larger national population due to the limited number of non-African American minority children and the majority middle-class make-up of the families, many of whom were upper-middle class professional parents. A more racially and economically diverse population would be useful in future research. Additionally, the longitudinal sample size was also limited, which may have contributed to the limited predictive power of Time 1 SBS.

One final weakness is the exclusive use of a female researcher with the attachment story completion task. This may explain why less secure scripts were found for boys; they may have felt less comfortable with the researcher than the girls did.

Future Directions

Future studies should address the influence of SBS on adaptive functioning across time with larger and more diverse samples to better understand the predictive power of SBS on subsequent adaptive functioning. Such samples would increase the generalizability of these results. Future studies enrolling children affected by societal shutdowns of schools and preschools or born during and post-pandemic will be important to determine whether there are cohort effects for SBS and whether its associations with other adaptive functioning measures can be detected. The unknown lasting impact of the pandemic on early childhood development and attachment as a larger construct need to be examined. It is possible that this period of rapid societal change across many domains is accompanied by changes in attachment and the conditions that support secure attachments in children. Comparing new cohorts of children to children assessed previously will illuminate possible changes in the prevalence and strength of secure attachments in post-pandemic children.

Conclusion

This study demonstrates the importance of the secure base script in understanding adaptive functioning in the preschool context. Attachment security is an organizing construct for adaptive development, shown in this study by the widely ranging significant correlations across multiple measures of positive preschool adaptation. Children with more secure representations of attachment tend to be more socially competent, with higher effortful and inhibitory control, and tend to have more positive teacher-child relationships. Child age plays a role in these relationships, with SBS having larger associations with adaptive functioning for four-year-olds. This may be due to normative advances and increased variability in scores in the adaptive domains measured in this study. Larger and more diverse samples are needed to test this speculative hypothesis. Finally, study results indicate that the SBS score shows significant stability over the age-span studied; suggesting that the attachment experiences of children during infancy and toddlerhood inform their mental representations of close relationships by early childhood. This is, of course, a grounding presumption of Bowlby's theory of attachment.

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Appendix A

Table 1

Adaptive Functioning Variable and Demographic Correlations - *Younger*

	Descriptives			Correlations		
	Mean (SD)	Minimum	Maximum	Age	Sex	Ethnicity
1. Script	3.93 (.87)	1.52	5.71	.11	.13	.06
2. PPVT	116.51 (11.65)	87.00	143.00	-.14⁺	-.06	-.16⁺
3. Nine Box	4.13 (1.14)	2.00	8.00	.19*	.25**	-.09
4. Delayed Alt.	4.75 (5.27)	-2.00	16.00	.18*	.15⁺	.04
5. Animal Sounds	12.62 (3.21)	6.00	19.40	.45***	.01	.03
6. Shape School	5.05 (1.34)	0.00	6.00	.14	.33**	.07
7. Stroop	8.18 (2.93)	2.00	12.00	.18	.27*	.04
8. Snack	15.52 (4.54)	5.00	24.00	.48***	.26**	-.15
9. Go-no-go	3.06 (2.36)	-1.25	8.60	.25*	.27*	-.03
10. Effort. Control	4.74 (.84)	1.38	6.68	.09	.34***	.04
11. Antisoc. Behav.	0.31 (.39)	-0.42	1.54	-.09	-.28**	-.16
12. Social Comp.	4.30 (1.10)	2.35	6.00	-.40***	.09	.14
13. TC Conflict	2.03 (.96)	1.00	4.93	.06	-.24**	-.15
14. TC Closeness	4.39 (.46)	2.57	5.00	-.12	.31***	-.02
15. Positive Nom.	0.01 (.99)	-1.76	2.96	.09	.06	-.11
16. Paired Comp.	0.03 (.99)	-.2.63	2.09	-.08	-.05	-.11
17. Q-sort	-0.09 (.24)	-0.48	0.48	.14	.14	-.17⁺

Note. ⁺p < .1, *p < .05, **p < .01, ***p < .001; N = 134. Positive Nominations and Paired Comparison were standardized across classroom size. Male = 0 (Female = 1). EA = 1 (African American = 2; Other = 3).

Appendix B

Table 2

Adaptive Functioning Variable Statistics and Demographic Correlations - Older

	Descriptives			Correlations		
	Mean (SD)	Minimum	Maximum	Age	Sex	Ethnicity
1. Script	4.09 (1.12)	1.48	6.48	.17^{+}	.35***	-.14
2. PPVT	114.76 (13.18)	73.00	142.00	.07	.05	-.18^{+}
3. Nine Box	4.42 (1.28)	2.00	9.00	.26**	.03	-.19*
4. Delayed Alt.	7.44 (5.87)	-1.00	16.00	.30**	.02	.07
5. Animal Sounds	16.61 (3.03)	6.00	21.37	.20^{+}	.14	-.06
6. Shape School	5.23 (1.43)	0.00	6.00	.12	.12	-.17
7. Stroop	10.09 (2.21)	2.00	12.00	.12	.18^{+}	-.03
8. Snack	14.70 (5.57)	0.00	24.00	.42***	.09	-.11
9. Go-no-go	4.80 (2.54)	0.10	8.60	.06	.07	.10
10. Effort. Control	5.03 (1.03)	2.76	6.65	.13	.35***	-.01
11. Antisoc. Behav.	-0.06 (.32)	-0.67	1.02	-.11	-.21*	.02
12. Social Comp.	4.30 (1.10)	2.35	6.00	-.41***	.29**	.01
13. TC Conflict	1.67 (.86)	1.00	4.57	-.09	-.17^{+}	-.06
14. TC Closeness	4.46 (.49)	2.56	5.00	.19	.23*	.01
15. Positive Nom.	-0.03 (.98)	-1.73	2.71	.08	-.14	-.08
16. Paired Comp.	-0.01 (.98)	-.2.26	2.60	.16^{+}	-.02	-.19*
17. Q-sort	0.55 (.14)	-0.47	0.54	.01	.11	-.21*

Note. $^{+}p < .1$, $*p < .05$, $**p < .01$, $***p < .001$; N = 135. Positive Nominations and Paired Comparison were standardized across classroom size. Male = 0 (Female = 1). EA = 1 (African American = 2; Other = 3).

Appendix C

Table 3

Correlation Matrix Adaptive Functioning Measures - Younger

	Competency Measures															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Script																
2. PPVT	.21*															
3. Nine Box	-.06	.01														
4. Delayed Alt.	.02	.01	.30**													
5. Animal Sounds	.16	.24*	.23*	.27*												
6. Shape School	-.01	.18	.15	.04	-.03											
7. Stroop	.31**	.24*	.20^{+}	.28*	.38**	.28*										
8. Snack	.19*	-.01	.20*	.26**	.45***	.08	.33**									
9. Go-no-go	.17	.09	.17	.09	.36**	.19	.48***	.34**								
10. Effort. Control	.16^{+}	.06	.22*	.18*	.25*	.16	.23**	.23**	.18							
11. Antisoc. Behav.	-.14	-.05	-.24**	-.23*	-.28*	-.01	-.13	-.26**	-.35**	-.66***						
12. Social Comp.	.04	.16^{+}	.09	.11	.25*	-.03	.17	-.18^{+}	.30**	.33***	-.52***					
13. TC Conflict	-.11	-.01	-.13	.09	-.12	-.11	-.05	-.30**	-.20^{+}	-.47***	.58***	-.26**				
14. TC Closeness	.20*	.20*	.18^{+}	.12	.22^{+}	.14	.14	.22*	.20^{+}	.45***	-.42***	.38***	-.40***			
15. Positive Nom.	-.02	.02	.27**	.07	.24*	.09	.38**	.09	.07	.19*	-.14	.12	-.08	.17^{+}		
16. Paired Comp.	.14	.19*	.03	.11	.04	.15	.27*	.11	.03	.25**	-.22*	.27**	-.20*	.23*	.46***	
17. Q-sort	.28**	.21*	.17^{+}	.10	.23*	.28*	.40***	.09	.26*	.01	-.03	-.01	-.01	.08	.15	.08

Note. $^{+}p < .1$, *$p < .05$, **$p < .01$, ***$p < .001$.

Appendix D

Table 4

Correlation Matrix Adaptive Functioning Measures - Older

	Competency Measures															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Script																
2. PPVT	.18^{+}															
3. Nine Box	.24*	.16^{+}														
4. Delayed Alt.	.13	.14	.21**													
5. Animal Sounds	.37***	.41***	.21*	.19^{+}												
6. Shape School	.30**	.48***	.15	.18^{+}	.33**											
7. Stroop	.26*	.27*	.07	.11	.36**	.22*										
8. Snack	.35***	.18^{+}	.43***	.27**	.21*	.37***	.15									
9. Go-no-go	.09	.32**	.39***	.10	.15	.26*	.31**	.21*								
10. Effort. Control	.32**	.37***	.15^{+}	.34***	.43***	.42***	.15	.31**	.19^{+}							
11. Antisoc. Behav.	-.35	-.22*	-.20*	-.27**	-.43***	-.36***	-.05	-.29**	-.05	-.64***						
12. Social Comp.	.08	.08	-.20*	.03	.42***	.36**	.07	-.18^{+}	-.04	.38***	-.52***					
13. TC Conflict	-.16	-.04	-.18*	-.13	-.22*	-.23*	-.06	-.25**	-.14	-.47***	.60***	-.25**				
14. TC Closeness	.09	.33***	.16^{+}	.22*	.26*	.37***	.16	.18*	.09	.51***	-.47***	.28**	-.39***			
15. Positive Nom.	.24*	.01	.10	.12	.28**	.10	.05	.10	.17	.04	-.10	.03	-.01	.07		
16. Paired Comp.	.27**	.16^{+}	.11	.27**	.32**	.28**	.24*	.18^{+}	.25*	.33***	-.32***	.23*	-.18^{+}	.25**	.54***	
17. Q-sort	.18^{+}	.26**	.23*	.07	.37***	.29**	.09	.14	.16	.25**	-.30**	.21*	-.22*	-.27**	.24**	.18*

Note. $^{+}p < .1$, $*p < .05$, $**p < .01$, $***p < .001$.

Appendix E

Table 5

Summary Statistics - Longitudinal cases

	Mean (SD)		Minimum		Maximum	
	Time 1	Time 2	Time 1	Time 2	Time 1	Time 2
1. Script	3.79 (.82)	4.39 (.97)**	1.52	1.48	5.38	6.48
2. PPVT	117.71 (11.20)	116.21 (12.48)	87.00	73.00	143.00	142.00
3. Nine Box	4.34 (1.24)	4.60 (1.20)	2.00	2.00	8.00	9.00
4. Delayed Alt.	4.85 (5.42)	8.67 (6.11)***	-2.00	-1.00	16.00	16.00
5. Animal Sounds	12.85 (3.24)	17.10 (3.08)***	6.00	7.00	19.40	21.37
6. Shape School	5.04 (1.38)	5.54 (.82)	0.00	2.00	6.00	6.00
7. Stroop	9.23 (2.37)	8.33 (3.26)**	4.00	2.00	12.00	12.00
8. Snack	14.05 (3.85)	16.40 (4.85)**	6.00	4.00	23.00	24.00
9. Go-no-go	3.10 (2.43)	4.27 (2.37)	-1.25	0.88	8.60	8.60
10. Effort. Control	4.78 (.67)	5.24 (.95)***	3.18	2.93	6.00	6.65
11. Antisoc. Behav.	0.26 (.34)	-0.07 (.36)***	-.30	-64	1.33	0.93
12. Social Comp.	4.13 (.87)	4.03 (1.17)	1.80	2.35	5.80	6.00
13. TC Conflict	1.92 (.89)	1.76 (.95)	1.00	1.00	4.93	4.57
14. TC Closeness	4.45 (.39)	4.45 (.51)	3.50	2.56	5.00	5.00
15. Positive Nom.	-0.01 (1.01)	-0.01 (1.01)	-1.76	-1.72	2.71	2.96
16. Paired Comp.	-0.06 (.97)	0.16 (1.01)	-2.63	-2.45	2.04	1.93
17. Q-sort	0.12 (.24)	0.16 (.23)	-0.48	-0.40	0.48	0.55

Note. *$p < .05$, **$p < .01$, ***$p < .001$. Over half of the Time 2 values were missing for Animal Sounds, Shape School, Stroop, and Go-No-Go (n = 40 for all). Positive Nominations and Paired Comparison were standardized across classroom size.

Appendix F

Table 6

Longitudinal Correlations

Time 1	N	Time 2	N
1. Script	77	.31*	55
2. PPVT	77	.57***	68
3. Nine Box	76	.04	62
4. Delayed Alt.	76	.35**	66
5. Animal Sounds	72	$.26^{+}$	32
6. Shape School	72	.07	32
7. Stroop	74	.21	33
8. Snack	77	.22*	64
9. Go-no-go	74	$.26^{+}$	32
10. Effort. Control	78	.67***	69
11. Antisoc. Behav.	78	.48***	69
12. Social Comp.	78	$.17^{+}$	69
13. TC Conflict	78	.60***	69
14. TC Closeness	78	.30**	69
15. Positive Nom.	76	.21*	66
16. Paired Comp.	79	-.08	66
17. Q-sort	78	.24*	76

Note. $^{+}p < .1$, $*p < .05$, $**p < .01$, $***p < .001$. Over half of the Time 2 values were missing for Animal Sounds, Shape School, Stroop, and Go-No-Go (n = 40 for all). Positive Nominations and Paired Comparison were standardized across classroom size.

Appendix G

Table 7

Correlation Matrix Adaptive Functioning Measures – Across Time Longitudinal Cases

	Competency Measures – Time 1																
Time 2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Script		.35**	-.05	.22^{+}	.15	-.21	-.06	-.06	.09	.18	-.24^{+}	.21^{+}	-.05	-.01	.09	.20	.24*
2. PPVT	.27*		.03	.09	.07	.20	-.08	-.05	-.17	.24*	.06	-.08	.16	-.05	-.05	-.15	.24*
3. Nine Box	.08	.16		-.14	.01	.07	.06	.15	-.15	.21	-.22^{+}	.19	-.16	-.04	.34**	.06	.20^{+}
4. Delayed Alt.	.19	.12	.12		.21	-.02	.05	.27*	-.13	.04	-.28*	.09	-.20^{+}	.06	.22^{+}	.06	-.04
5. Animal Sounds	.09	.25^{+}	.02	.14		-.03	.01	.03	.09	.19	-.30*	.26*	-.13	.10	.28*	.37**	.04
6. Shape School	.13	.23^{+}	.05	.05	.10		.22^{+}	.25*	.28	.08	-.22^{+}	.04	-.23^{+}	.19	-.15	.02	.25*
7. Stroop	.22	.32*	.09	.39**	.33^{+}	-.18		.27*	.35*	.48***	-.37**	.10	-.10	.04	.36**	.37**	.11
8. Snack	.32**	.13	.10	.13	.22	.14	.25		.22	.25*	-.40**	.17	-.35**	.08	.27*	.25^{+}	.01
9. Go-no-go	.09	.08	-.08	.29*	.37*	.08	.22	.04		.29*	-.39**	.35**	-.33**	.17	.19	.20	.06
10. Effort. Control	.34**	.27*	.26*	.27*	.27	.09	.10	.47***	.10		-.41**	.01	-.38**	.38**	.31*	-.06	-.01
11. Antisoc. Behav.	-.15	-.11	-.17	-.14	-.22	-.11	-.06	-.18	-.25	-.41**		-.24*	.38***	-.21^{+}	-.22^{+}	-.18	.04
12. Social Comp.	.16	.20	.18	.27*	.07	-.07	-.02	.15	.26	.40**	-.35**		-.36**	.19	.23^{+}	.11	.01
13. TC Conflict	-.15	.08	-.04	-.04	-.35*	-.10	.09	-.12	-.16	-.34**	.38**	-.12		-.19	-.17	-.20	-.17
14. TC Closeness	.20	.27*	.08	.14	.12	-.02	-.10	.04	.17	.30*	-.25*	.26*	-.12		.16	.02	.18
15. Positive Nom.	.25^{+}	-.01	.15	.12	.16	-.04	.01	.06	.32*	.20^{+}	-.24*	.22^{+}	-.06	.14		.42***	.18
16. Paired Comp.	.11	.16	.03	.10	.08	-.16	.12	.11	.01	.20^{+}	-.07	.04	.05	-.03	.37**		.27*
17. Q-sort	.19	.03	-.05	.12	-.05	-.19	.22	-.02	.32*	.11	-.09	.06	-.09	.15	.14	.22*	

Note. $^{+}p < .1$, $*p < .05$, $**p < .01$, $***p < .001$.

Appendix H

Table 8

Correlation Matrix Adaptive Functioning Measures – Within Time Longitudinal Cases (Time 1)

	Competency Measures – Time 1															
Time 1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Script																
2. PPVT	.37**															
3. Nine Box	-.06	-.08														
4. Delayed Alt.	.08	-.04	.16													
5. Animal Sounds	.22$^+$	.19	.14	.22$^+$												
6. Shape School	.09	.20	.14	.01	.01											
7. Stroop	.33**	.25*	.19	.27*	.44***	.20										
8. Snack	.32**	-.02	.26*	.32**	.45***	-.02	.30*									
9. Go-no-go	.26*	.12	.15	.11	.43***	.25*	.54***	.38**								
10. Effort. Control	.18	.24*	.17	.14	.15	.12	.30*	.29*	.23$^+$							
11. Antisoc. Behav.	-.21$^+$	.03	-.16	-.15	-.17	.01	-.23*	-.34**	-.39**	-.48***						
12. Social Comp.	.24*	.13	.08	.17	.21$^+$	-.03	.27*	.31**	.36**	.50***	-.84***					
13. TC Conflict	-.32**	.02	-.02	.01	-.09	-.09	-.09	-.39**	-.22$^+$	-.38**	.53***	-.38**				
14. TC Closeness	.47***	.20$^+$	.13	.14	.16	.14	.18	.23$^+$	.22$^+$	.47***	-.35**	.37**	-.42***			
15. Positive Nom.	.14	-.02	.17	.07	.34**	-.01	.25*	.15	.12	.06	-.10	.03	-.10	.23*		
16. Paired Comp.	.20	.21$^+$	.06	.11	-.01	.06	.21	.12	.07	.34**	-.26*	.36**	-.19	.25*	.27*	
17. Q-sort	.24*	.24*	.15	.08	.30*	.21	.37**	.17	.33**	.13	-.01	.10	.10	.19	.19	.08

Note. $^+p < .1$, $*p < .05$, $**p < .01$, $***p < .001$.

Appendix I

Table 9

Correlation Matrix Adaptive Functioning Measures – Within Time Longitudinal Cases (Time 2)

	Competency Measures – Time 2															
Time 2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Script																
2. PPVT	.03															
3. Nine Box	.15	.14														
4. Delayed Alt.	.13	.10	.34**													
5. Animal Sounds	-.05	.22	.40*	.29^{+}												
6. Shape School	-.10	.18	-.19	-.20	.06											
7. Stroop	.23	.14	.06	.13	.06	-.03										
8. Snack	.18	.09	.58***	.33**	.36*	.13	.33*									
9. Go-no-go	.02	-.10	.38*	.14	.16	.07	.15	.34*								
10. Effort. Control	.16	.25*	.18	.25*	.51**	.07	.28^{+}	.34**	.38*							
11. Antisoc. Behav.	-.14	-.21	-.29*	-.38**	-.74***	-.02	-.08	-.25*	-.36*	-.61***						
12. Social Comp.	.02	.06	-.32**	-.04	.62***	-.10	.01	-.36**	.20	.20	-.47***					
13. TC Conflict	-.01	-.02	-.21^{+}	-.21^{+}	-.36*	-.18	.01	-.23^{+}	-.23	-.43***	.59***	-.10				
14. TC Closeness	.08	.27*	.21	.21^{+}	.23	-.06	.26	.25	.17	.45***	-.43***	.10	-.43***			
15. Positive Nom.	.31*	.05	-.07	.18	-.06	-.27	.17	.11	-.05	.21	-.14	.17	-.08	.15		
16. Paired Comp.	.19	.03	-.05	.12	-.05	-.19	.22	-.02	.32*	.11	-.09	.17	-.01	.08	.49***	
17. Q-sort	.07	.12	.12	-.03	.17	.02	.07	.01	.12	.08	-.18	.18	--.18	-.01	.18	.08

Note. $^{+}p < .1$, $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

Appendix J

Table 10

Factor Loadings - Younger

	SC	IC	WM	TCR
Paired Comparisons	.54			
Social Competence	.79			
Antisocial	-.83			
Effortful Control	.73			
Snack Delay		.84		
Delayed Alternation		.54		
Nine Boxes		.43		
Stroop			.90	
Go-no-go			.89	
Shape School			.50	
Closeness				0.83
Conflict (Reversed)				0.83

Note. N = 135. Three items were removed for poor loading (below .4): positive nominations (SC), Q-sort (SC), Animal Sounds (WM).

Appendix K

Table 11

Factor Loadings - Older

	SC	IC	WM	TCR
Paired Comparisons	.76			
Social Competence	.85			
Antisocial	-.76			
Effortful Control	.68			
Snack Delay		.80		
Delayed Alternation		.56		
Nine Boxes		.75		
Stroop			.84	
Go-no-go			.88	
Shape School			.57	
Closeness				0.83
Conflict (Reversed)				0.83

Note. *N* = 135. Three items were removed for poor loading (below .4): positive nominations (SC), Q-sort (SC), Animal Sounds (WM).

Appendix L

Table 12

Factor Correlations - Younger

	1	2	3	4	5	6	7
1. SC							
2. IC	0.03						
3. WM	0.16*	-0.001					
4. TCR	0.59***	0.22**	0.13				
5. Script	0.10	0.15^{+}	0.15^{+}	0.16*			
6. PPVT	0.14^{+}	-0.06	0.19*	0.12	0.23**		
7. Sex	0.16*	0.25**	0.18*	0.30***	0.11	-0.04	

Note. N = 139. $^{+}p < .1$, $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

Table 13

Factor Correlations - Older

	1	2	3	4	5	6	7
1. SC							
2. IC	-0.02						
3. WM	0.07	-0.02					
4. TCR	0.48***	0.37***	-0.05				
5. Script	0.23**	0.37***	0.05	0.17*			
6. PPVT	0.22*	0.25**	0.24**	0.22**	0.22**		
7. Sex	0.26**	0.06	0.12	0.21*	0.29***	0.05	

Note. N = 149. $^{+}p < .1$, $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

Appendix M

Table 14

Factor Correlations – Longitudinal Cases Time 1

	1	2	3	4	5	6	7
1. SC							
2. IC	0.25*						
3. WM	.11	0.36**					
4. TCR	0.57***	0.26*	0.11				
5. Script	0.22^{+}	0.17	0.31***	0.39***			
6. PPVT	0.21^{+}	-0.07	0.25*	0.09	.36**		
7. Sex	0.28*	0.27*	0.28*	0.35**	0.17	-0.08	

Note. $N = 79$. $^{+}p < .1$, $*p < .05$, $**p < .01$, $***p < .001$.

Table 15

Factor Correlations – Longitudinal Cases Time 2

	1	2	3	4	5	6	7
1. SC							
2. IC	-0.14						
3. WM	0.22^{+}	-0.16					
4. TCR	0.27*	0.34**	-0.12				
5. Script	0.18	0.23*	0.18	0.04			
6. PPVT	0.17	0.17	-0.01	0.18	0.13		
7. Sex	0.22^{+}	0.21^{+}	0.18	0.21^{+}	0.20	0.05	

Note. $N = 79$. $^{+}p < .1$, $*p < .05$, $**p < .01$, $***p < .001$.

Appendix N

Table 16

Factor Correlations – Longitudinal Cases Across Time

	Time 2					
Time 1	1	2	3	4	5	6
1. SC	0.29**	0.33**	-0.04	0.33**	0.24*	0.24*
2. IC	0.20+	0.18	0.03	0.18	0.20+	0.12
3. WM	0.34**	0.11	0.16	0.15	0.20+	0.20+
4. TCR	0.34**	0.12	0.02	0.40***	0.19	0.09
5. Script	0.24*	0.11	-0.02	0.01	0.28*	0.35**
6. PPVT	0.06	0.08	-0.07	-0.10	0.13	0.55**

Note. $N = 79$. $^{+}p < .1$, $*p < .05$, $**p < .01$, $***p < .001$.

Appendix O

Table 17

Path Analysis with SBS as Predictor and Age as Moderator

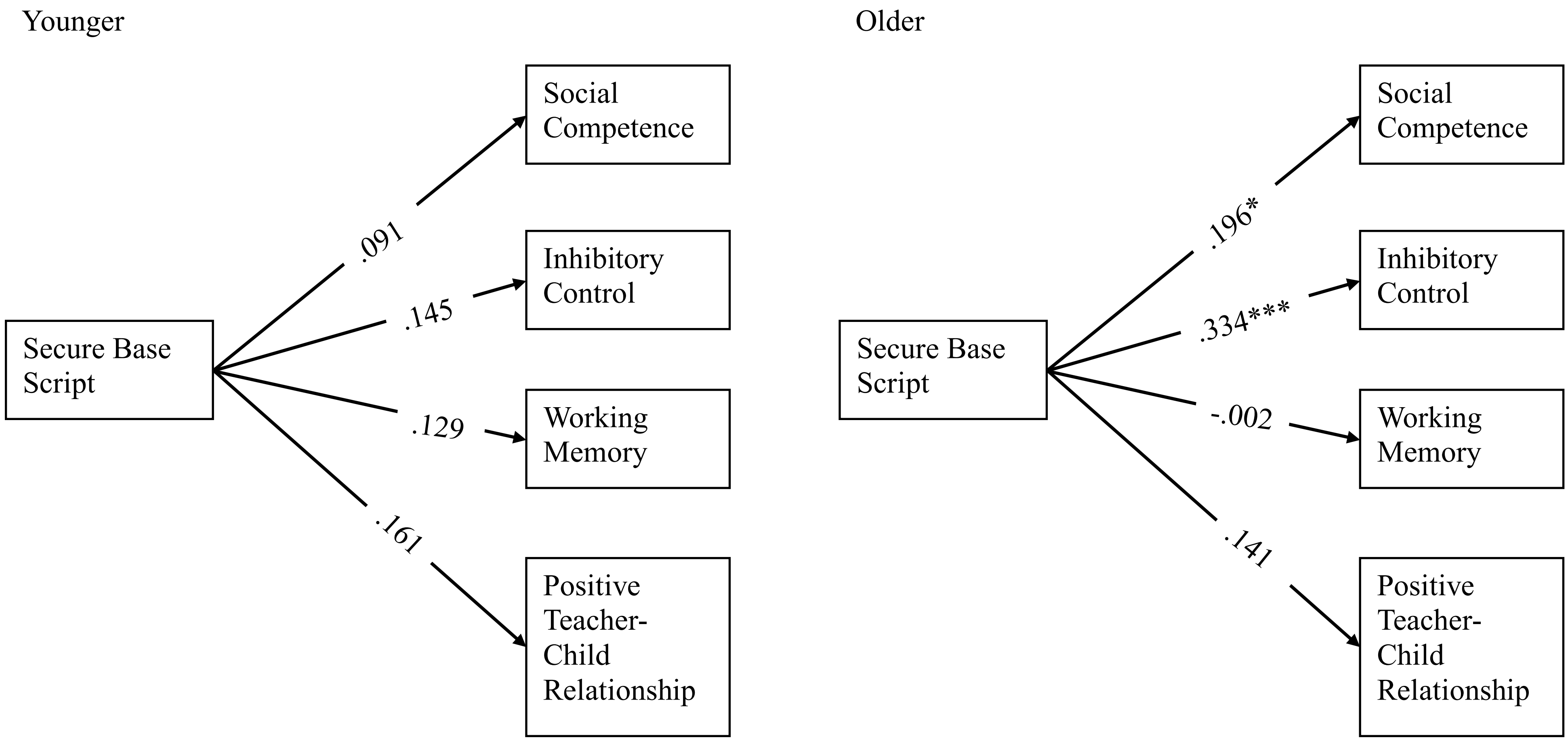
		SBS (*se*)	R^2
Social Competence - Younger		0.101(0.090)	0.023
	95% CI	[-0.076, 0.278]	
	β	0.091	
Older		0.182(0.077)*	0.064
	95% CI	[0.032, 0.332]	
	β	0.196	
Executive Functioning - Younger		0.158(0.088)$^{+}$	0.038
	95% CI	[-0.014, 0.330]	
	β	0.145	
Older		0.317(0.075)***	0.145
	95% CI	[0.170, 0.463]	
	β	0.334	
Working Memory – Younger		0.072(0.044)	0.075
	95% CI	[-0.014, 0.158]	
	β	0.129	
Older		-0.001(0.052)	0.028
	95% CI	[-0.103, 0.101]	
	β	-0.002	
Teacher-Child Relationship - Younger		0.180(0.090)*	0.042
	95% CI	[0.004, 0.357]	
	β	0.161	
Older		0.129(0.076)$^{+}$	0.042
	95% CI	[-0.020, 0.278]	
	β	0.141	

Note. $^{+}p < 0.1$, $*p < 0.05$, $**p < 0.01$, $***p < 0.001$. CI = confidence interval. Structural fit: $\chi^2 = 13.63$, $df = 7$, $p = .06$; CFI = .97; RMSEA = .08.

Appendix P

Figure 1

Path Analysis Model of Associations Between SBS and Adaptive Functioning



Note. Structural equation model predicting adaptive functioning from SBS score, moderated by age group, while controlling for Time 1 adaptive functioning and sex. Standardized coefficients are presented.

*$p < .05$, **$p < .01$, ***$p < .001$. Structural model fit: $\chi^2 = 13.63$, $df = 7$, $p = .06$; CFI = .97; RMSEA = .08.

Appendix Q

Table 18

Path Analysis with PPVT Added as a Predictor and Age as Moderator

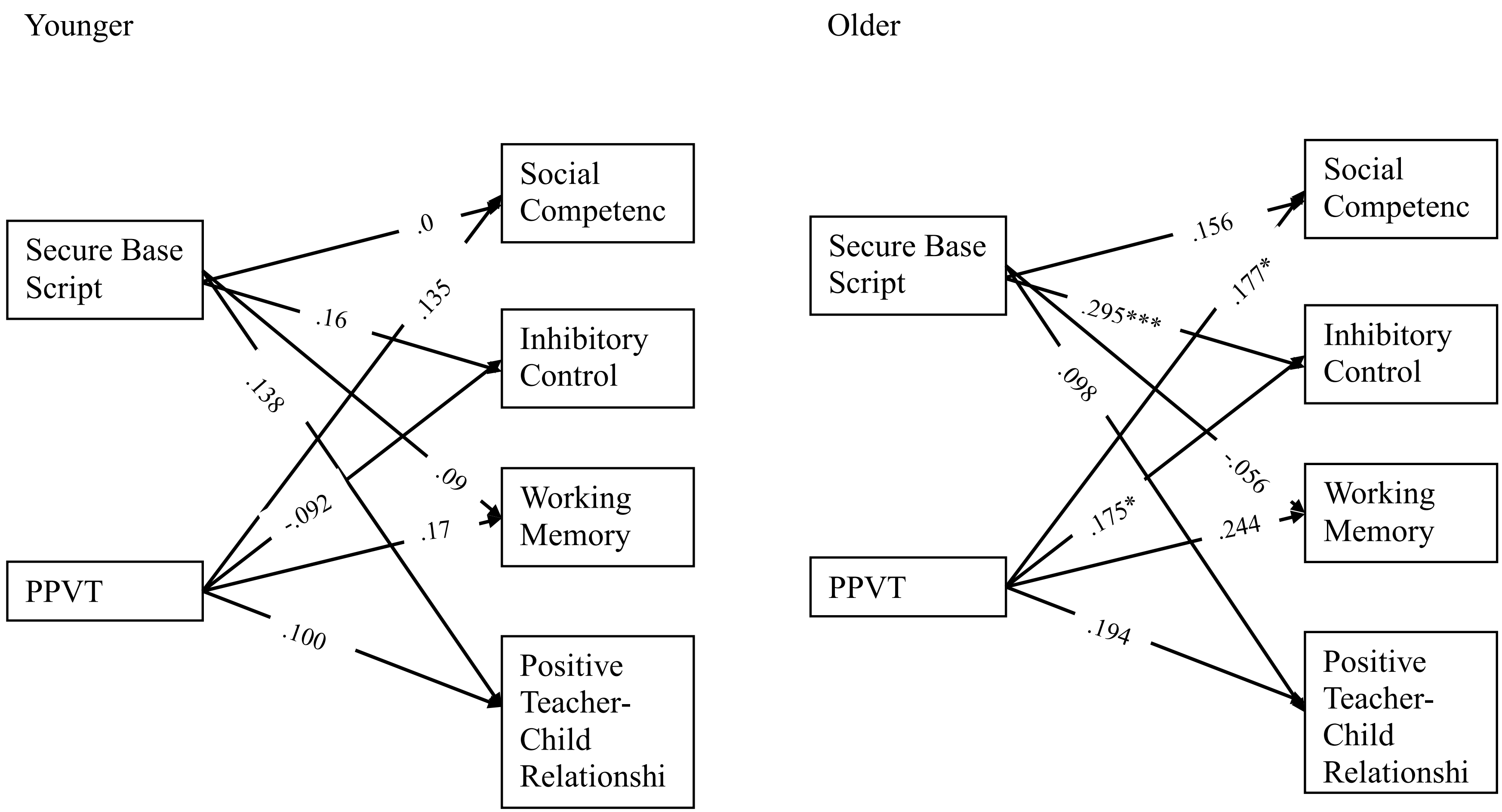
		SBS (*se*)	PPVT (*se*)	R^2
Social Competence - Younger		0.067(0.092)	0.011(0.007)	0.039
	95% CI	[-0.113, 0.247]	[-0.002, 0.024]	
	β	0.060	0.135	
Older		0.145(0.077)$^{+}$	0.013(0.006)*	0.093
	95% CI	[-0.006, 0.297]	[0.001, 0.025]	
	β	0.156	0.177	
Inhibitory Control - Younger		0.181(0.090)*	-0.07(0.007)	0.048
	95% CI	[0.005, 0.356]	[-0.020, 0.006]	
	β	0.165	-0.092	
Older		0.280(0.075)***	0.013(0.006)*	0.174
	95% CI	[0.132, 0.427]	[0.002, 0.025]	
	β	0.295	0.175	
Working Memory – Younger		0.050(0.044)	0.007(0.003)*	0.100
	95% CI	[-0.037, 0.137]	[0.001, 0.013]	
	β	0.090	0.171	
Older		-0.035(0.052)	0.012(0.004)**	0.085
	95% CI	[-0.136, 0.067]	[0.004, 0.020]	
	β	-0.056	0.244	
Teacher-Child Relationship - Younger		0.155(0.092)$^{+}$	0.008(0.007)	0.051
	95% CI	[-0.025, 0.3537	[-0.005, 0.021]	
	β	0.138	0.100	
Older		0.089(0.076)$^{+}$	0.129(0.076)**	0.078
	95% CI	[-0.061, 0.239]	[0.002, 0.026]	
	β	0.098	0.194	

Note. $^{+}p < 0.1$, $*p < 0.05$, $**p < 0.01$, $***p < 0.001$. CI = confidence interval. Structural fit: $\chi^2 = 13.55$, $df = 7$, $p = .06$; CFI = .97; RMSEA = .08.

Appendix R

Figure 2

Path Analysis Model of Associations Between SBS and PPVT and Adaptive Functioning



Note. Structural equation model predicting adaptive functioning from SBS score and PPVT (receptive vocabulary), moderated by age group, while controlling for sex. Standardized coefficients are presented. *p < .05, **p < .01, ***p < .001. Structural model fit: χ^2 = 13.55, df = 7, p = .06; CFI = .97; RMSEA = .08.

Appendix S

Table 19

Path Analysis with SBS as a Mediator

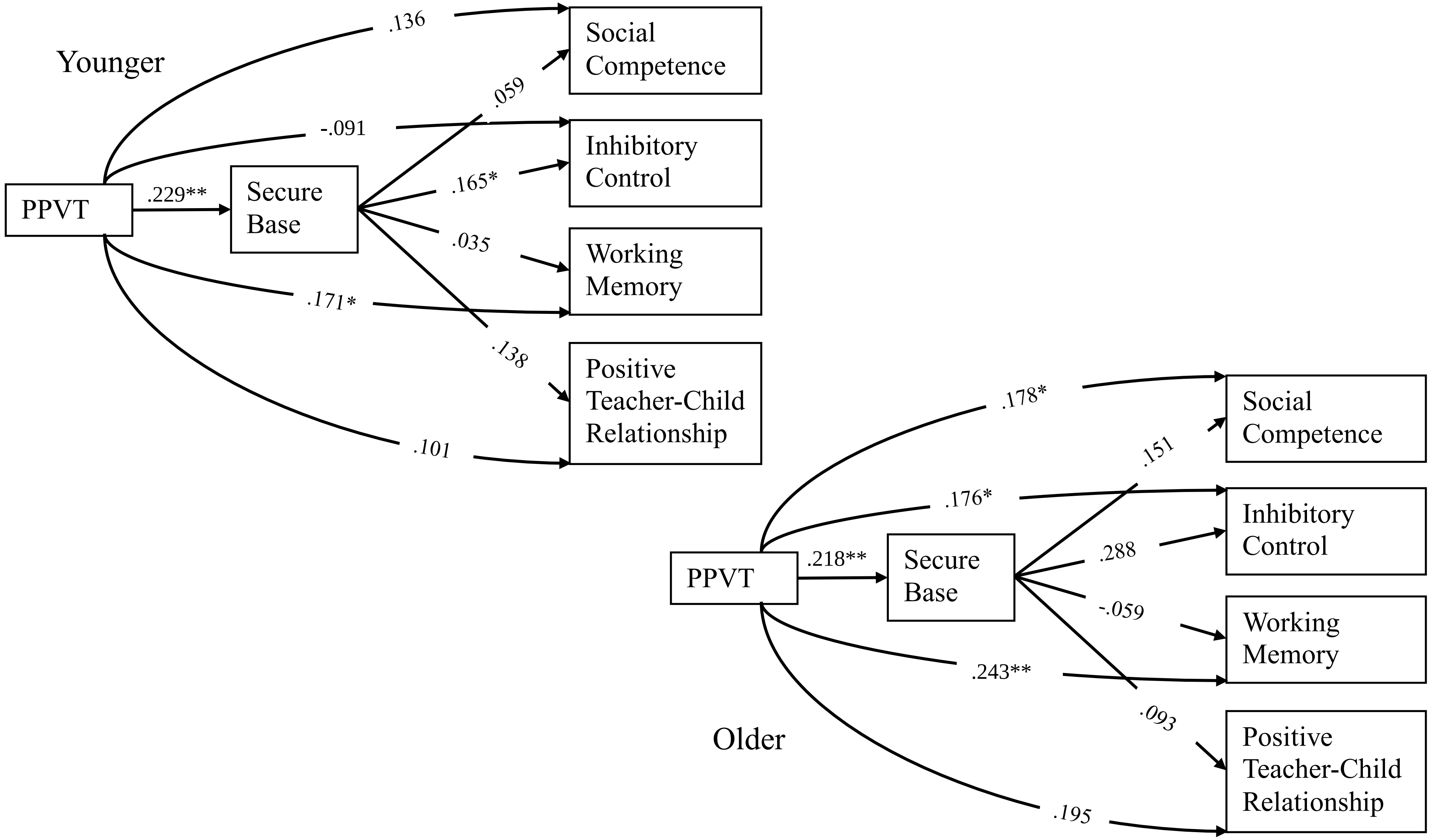
		B(*se*)	β	CI
	A Path			
Younger	PPVT → SBS	0.017(0.006)**	0.229	[0.005, 0.028]
Older	PPVT → SBS	0.017(0.006)**	0.218	[0.005, 0.030]
	B Path			
Younger	SBS → SC	0.066(0.091)	0.059	[-0.113, 0.244]
	SBS → IC	0.179(0.089)*	0.165	[0.004, 0.354]
	SBS → WM	0.007(0.012)	0.035	[-0.062, 0.076]
	SBS → TCR	0.154(0.044)$^{+}$	0.138	[-0.025, 0.332]
Older	SBS → SC	0.142(0.079)$^{+}$	0.151	[-0.012, 0.297]
	SBS → IC	0.277(0.077)***	0.288	[0.127, 0.427]
	SBS → WM	-0.038(0.053)	-0.059	[-0.141, 0.065]
	SBS → TCR	0.086(0.086)	0.093	[-0.066, 0.239]
	C Path			
Younger	PPVT → SC	0.011(0.007)$^{+}$	0.136	[-0.002, 0.024]
	PPVT → IC	-0.007(0.007)	-0.091	[-0.020, 0.006]
	PPVT → WM	0.007(0.003)*	0.171	[0.001, 0.013]
	PPVT → TCR	0.008(0.007)	0.101	[-0.005, 0.021]
Older	PPVT → SC	0.013(0.006)*	0.178	[0.001, 0.025]
	PPVT → IC	0.013(0.006)*	0.176	[0.002, 0.025]
	PPVT → WM	0.012(0.004)**	0.243	[0.004, 0.020]
	PPVT → TCR	0.014(0.006)**	0.195	[0.002, 0.026]
	Indirect Effects			
Younger	PPVT → SBS → SC	0.001(0.002)	0.014	[-0.002, 0.004]
	PPVT → SBS → IC	0.003(0.002)$^{+}$	0.038	[-0.001, 0.007]
	PPVT → SBS → WM	0.001(0.001)	0.020	[-0.001, 0.002]
	PPVT → SBS → TCR	0.003(0.002)	0.032	[-0.001, 0.003]
Older	PPVT → SBS → SC	0.002(0.002)	0.033	[-0.001, 0.006]
	PPVT → SBS → IC	0.005(0.002)*	0.063	[0.000, 0.009]
	PPVT → SBS → WM	-0.001(0.001)	-0.013	[-0.002, 0.001]
	PPVT → SBS → TCR	0.001(0.001)	0.020	[-0.001, 0.004]

Note. $^{+}p < 0.1$, $*p < 0.05$, $**p < 0.01$, $***p < 0.001$. CI = confidence interval. Structural fit: $\chi^2 = 18.37$, $df = 9$, $p = .03$; CFI = .96; RMSEA = .09.

Figure 3

Appendix T

Path Analysis Model of Associations Between PPVT and Adaptive Functioning with SBS as Mediator



Note. Structural equation model predicting adaptive functioning from PPVT score, mediated by SBS and moderated by age group, while controlling for sex. Standardized coefficients are presented. **p* < .05, ***p* < .01, ****p* < .001. Structural model fit: $\chi^2 = 18.37$, $df = 9$, $p = .03$; CFI = .96; RMSEA = .09.

Appendix U

Table 20

Longitudinal Path Analysis with T1 SBS as the Predictor

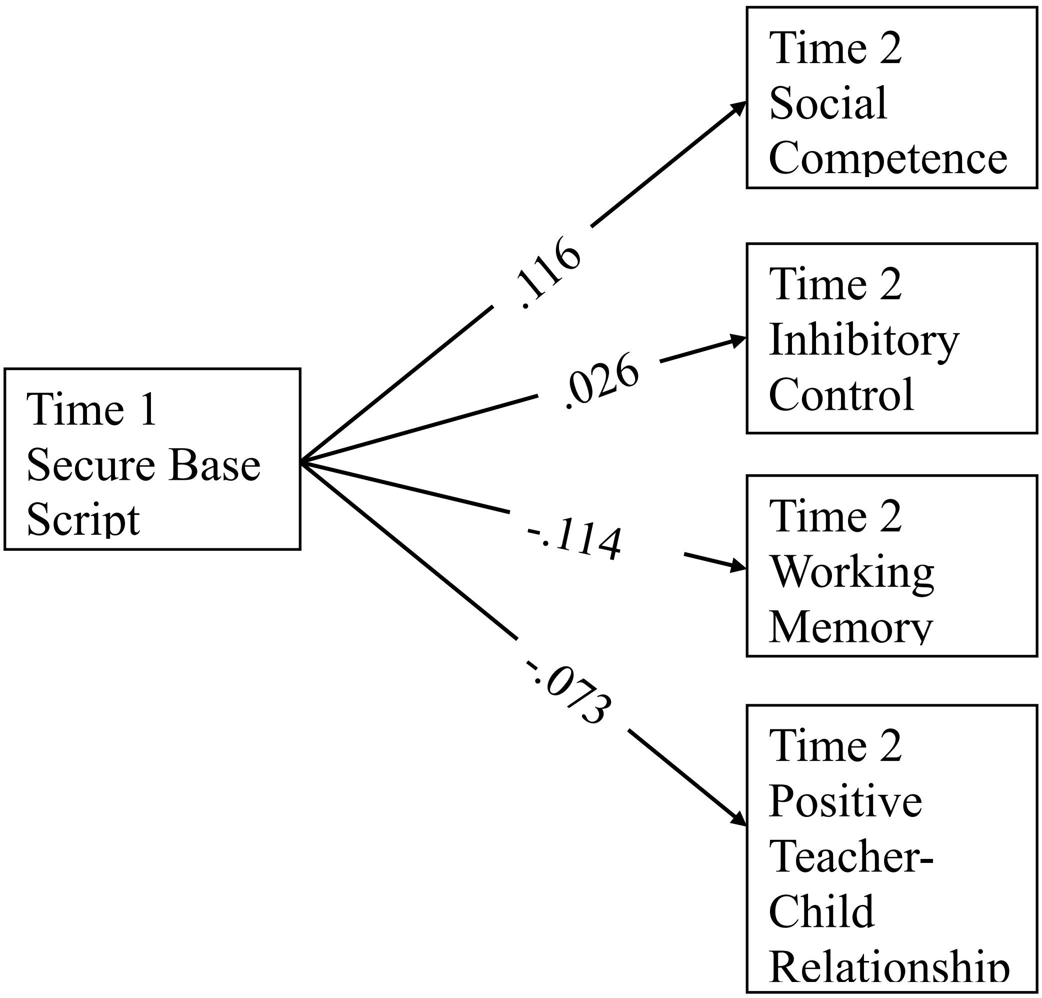
		T1 SBS (*se*)	R^2
T2 Social Competence		0.147(0.122)	0.264
	95% CI	[-0.093, 0.387]	
	β	0.116	
T2 Inhibitory Control		0.038(0.145)	0.188
	95% CI	[-0.246, 0.321]	
	β	0.026	
T2 Working Memory		-0.117(0.093)	0.344
	95% CI	[-0.300, 0.067]	
	β	-0.114	
T2 Teacher-Child Relationship		-0.103(0.143)	0.182
	95% CI	[-0.384, 0.178]	
	β	-0.073	

Note. $p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$. CI = confidence interval. Structural fit: $\chi^2 = 47.02$, $df = 4$, $p < .001$; CFI < .001; RMSEA = .37.

Appendix V

Figure 4

Longitudinal Path Analysis Model of Associations Between SBS and Adaptive Functioning



Note. Structural equation model predicting Time 2 adaptive functioning from Time 1 SBS score, while controlling for sex. Standardized coefficients are presented.

*$p < .05$, **$p < .01$, ***$p < .001$ Structural model fit: $\chi^2 = 47.02$, $df = 4$, $p < .001$; CFI < .001; RMSEA = .37.

Appendix W

Table 21

Standardized Factor Loadings – Replicating Nichols et al.

	SC	EF	TCR	EC
Positive Nom.	.013			
Paired Comp.	.008			
Q Sort 72	.012			
Q Sort 100	4.462			
Animal Sounds		8.534		
Snack Delay		-2.119		
Delayed Alternation		.551		
Nine Boxes		.083		
Stroop		.848		
Go-no-go		1.138		
Shape School		2.387		
Closeness			.236	
Conflict (Reversed)			.668	
Inhibitory Control				0.927
Attentional Focus				0.478
Low Intensity Pleasure				1.148

Note. N = 207. Nichols et al., removed Animal Sounds, Paired Comparisons, and Inhibitory Control in their analysis due to poor loading.

Appendix X

Table 22

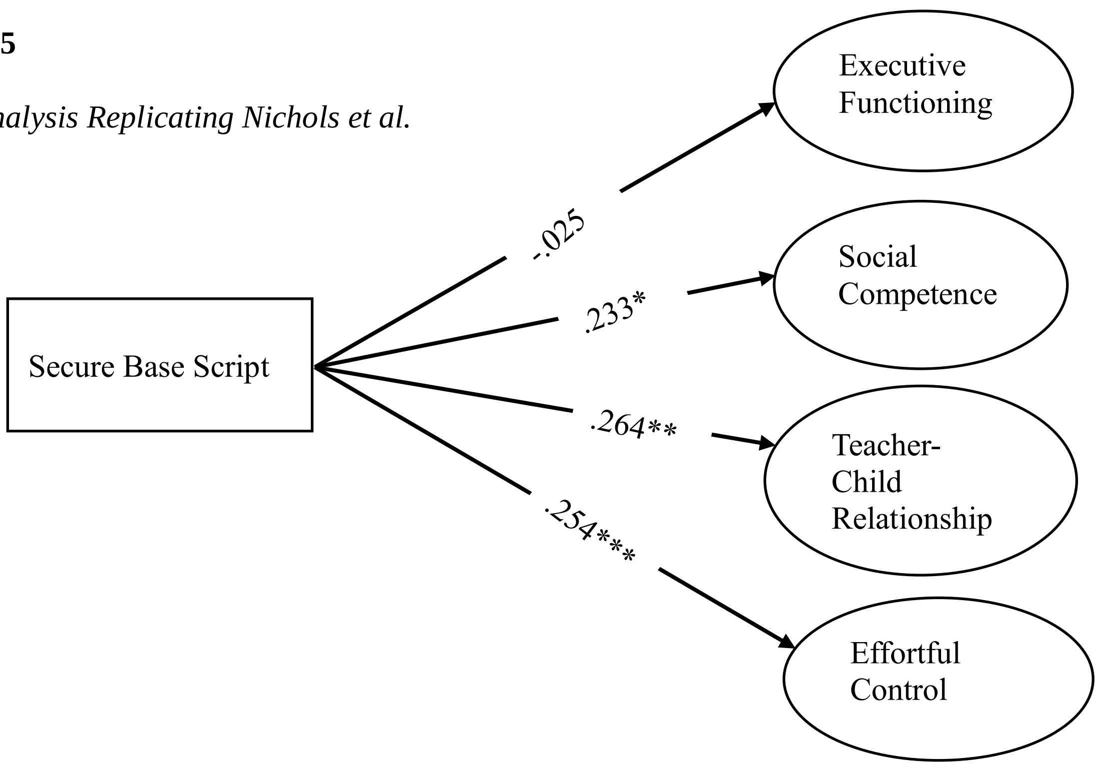
Path Analysis – Replicating Nichols et al.

		SBS (*se*)	R^2
Social Competence		13.310(3.966)*	0.052
	95% CI	[5.538, 21.083]	
	β	0.233	
Executive Functioning		-0.029(0.081)	0.007
	95% CI	[-0.188, 0.130]	
	β	-0.025	
Teacher-Child Relationship		0.257(0.067)***	0.074
	95% CI	[0.126, 0.389]	
	β	0.264	
Effortful Control		0.273(0.074)***	0.073
	95% CI	[0.129, 0.418]	
	β	0.254	

Note. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$. CI = confidence interval.
Structural fit: $\chi^2 = 19.34$, $df = 4$, $p = .001$; CFI = .966; RMSEA = .136.
PPVT was controlled for in the model.

Figure 5

Path Analysis Replicating Nichols et al.

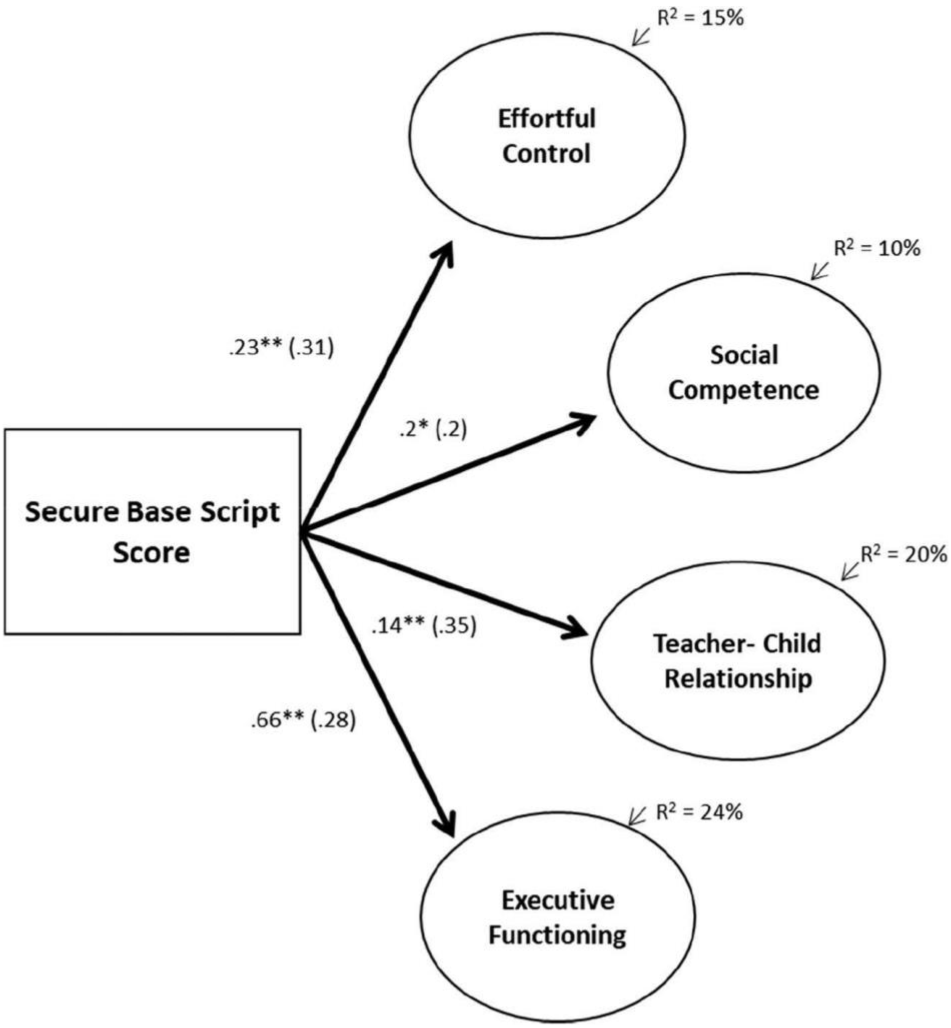


Note. Structural equation model predicting Time 2 adaptive functioning from Time 1 SBS score, while controlling for sex. Standardized coefficients are presented. *$p < .05$, **$p < .01$, ***$p < .001$.
Structural model fit: $\chi^2 = 19.34$, $df = 4$, $p < .001$; CFI = .97; RMSEA = .14.

Appendix Y

Figure 6

Path Analysis Model of Associations Between SBS and Adaptive Functioning from Nichols et al. (2019)[3]



Note. This figure was used with permission of Olivia Nichols. Structural equation model examining the relations between children's secure-base script score and four domains of functioning, while controlling for children's PPVT (verbal intelligence) scores. Standardized values are in parentheses.

*$p < .05$, **$p < .01$, ***$p < .001$ Structural model fit: $\chi^2 = 104.77$, $df = 64$, $p = .001$; $\chi^2/df = 1.64$; CFI = .93; RMSEA = .07.

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[3] Nichols, O., Vaughn, B. E., Lu, T., Krzysik, L., & El-Sheikh, M. (2019). Scripted attachment representations and adaptive functioning during early childhood. *Attachment & Human Development*, *21*(3), 289–306. https://doi.org/10.1080/14616734.2019.1575551

Appendix Z

Table 23

SBS Predicting Sociometric Variables Not Included in Path Analyses - Younger

		SBS (*se*)	R^2
Peer Acceptance Composite		0.062(0.091)	0.064
	95% CI	[-0.119, 0.242]	
	β	0.064	
Q-sort SC scores		0.228(0.075)**	0.293
	95% CI	[-0.213, 0.403]	
	β	0.293	

Note. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$. CI = confidence interval.

Table 24

SBS Predicting Sociometric Variables Not Included in Path Analyses - Older

		SBS (*se*)	R^2
Peer Acceptance Composite		0.075(0.024)**	0.277
	95% CI	[0.028, 0.122]	
	β	0.277	
Q-sort SC scores		$0.039(0.021)^{+}$	0.180
	95% CI	[-0.003, 0.080]	
	β	0.180	

Note. $^{+}p < 0.1$, $p < 0.05$, **$p < 0.01$, ***$p < 0.001$. CI = confidence interval.

Appendix AA

Table 25

Longitudinal Path Analysis with Time 2 SBS as a Mediator

	B(*se*)	*β*	CI
A Path			
T1 SBS → T2 SBS	0.208(0.127)	0.158	[-0.040, 0.456]
B Path			
T1 SBS → SC	0.059(0.138)	0.046	[-0.211, 0.329]
T1 SBS → IC	0.070(0.158)	0.048	[-0.240, 0.379]
T1 SBS → WM	-0.060(0.103)	-0.059	[-0.262, 0.142]
T1 SBS → TCR	-0.250(0.156)	-0.173	[-0.056, 0.057]
C Path			
T2 SBS → SC	-0.002(0.096)	-0.002	[-0.190, 0.187]
T2 SBS → IC	0.108(0.110)	0.098	[-0.109, 0.324]
T2 SBS → WM	0.074(0.072)	0.097	[-0.067, 0.215]
T2 SBS → TCR	-0.091(0.109)	-0.083	[-0.305, 0.123]
Indirect Effects			
T1 SBS → T2 SBS → SC	-0.000(0.020)	-0.000	[-0.040, 0.039]
T1 SBS → T2 SBS → IC	0.022(0.027)	0.015	[-0.030, 0.075]
T1 SBS → T2 SBS → WM	0.015(0.018)	0.015	[-0.019, 0.050]
T1 SBS → T2 SBS → TCR	-0.019(0.025)	-0.013	[-0.069, 0.031]

Note. $^{+}p < 0.1$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$. CI = confidence interval. Structural fit: $\chi^2 = 78.87$, $df = 9$, $p < .001$; CFI < .001; RMSEA = .31.