
Exploring Links between Parent-Child Playground Behavior and HEXACO Personality Traits

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The authors investigate the personality traits of parents and children and their significant influence on the behavior of the other. Using the HEXACO model of personality, the authors examine the behavior of one hundred parent-child dyads on a playground to understand broader parent-child relationships. Their analyses reveal two opposed types of parental behavior (engaged parents versus unengaged parents) and child behavior (introverted cautious play versus autonomous energetic play) on the playground. The authors assert their study demonstrates that the personality traits of both parents and children as measured by the HEXACO model play a significant role in parental and child behaviors during play and in broader interactions. **Key words:** HEXACO; parent-child behavior; parent-child interaction; personality traits

THE PERSONALITIES of parent and child significantly influence each other's behavior, as transaction models of parenting suggest. That these characteristics evidence important associations with parent and child interactions (Belsky 1984; de Haan, DeKovic, and Prinzie 2012) is especially apparent in the literature on the personality traits of parents and children (Coplan, Reichel, and Rowan 2009; Wilson and Durbin 2012). In particular, personality traits help explain the variance in parenting and parent-child behavior (Belsky 1984).

Indeed, a wide range of personality traits can help parents flexibly respond to their children (de Vries et al. 2016). Many studies have shown that the personality traits of parents have important links with their behavior and its outcomes for children (Belsky 1984; Clark, Donnelian, and Robins 2018; Prinzie et al. 2004; Wilson and Durbin 2012). Children's personality traits, too, have important implications for their behavior and for their parents' behavior (Belsky 1984; de Haan, DeKovic, and Prinzie 2012; Prinzie et al. 2004; Wilson and Durbin 2012).

Although many of these studies have used personality traits to study parents and temperamental traits to study children in early to middle childhood

(Armour et al. 2017; Coplan, Arbeau, and Armer 2008), temperamental traits, which are largely biological, prove less useful for understanding the influence of children on parental behavior in middle childhood, a period in which children are more strongly affected by their environment (Buss and Plomin 1986; Rothbart and Bates 1998). Personality traits are, thus, more appropriate because they represent the interaction between a child's predisposition and the environment (Buss 2009). Additionally, when comparing how individual differences in parents and children influence each other's behavior, it is important to use concurrent measurements (de Haan, DeKovic, and Prinzie 2012).

The HEXACO Personality Inventory (a six-dimensional model of human personality) helps address these gaps and offers several important advantages for studying personality traits associated with parent-child behavior. The HEXACO is a new personality model with stronger theoretical, empirical, and cross-cultural support than other personality models like the so-called "big five" [openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism—eds.] (Goldberg 1990). The HEXACO scale includes honesty-humility (selfishness versus selflessness), emotionality (empathic worrying versus callousness), extraversion (sociable versus introverted), agreeableness (patient versus reactive), conscientiousness (diligent versus careless), and openness (curious versus conventional) (Ashton and Lee 2020).

The HEXACO's unique combination of personality factors allows important distinctions between social motivations related to parent-child interactions and play behavior. In particular, the HEXACO's emotionality trait is perhaps the most important trait from a parent-child perspective not explicitly represented by a trait in other personality models. The attachment and worry-related aspects of emotionality can therefore provide unique information about the motivations of parent and child behavior. The HEXACO has been shown to be relevant for studying personality traits and behavior in both children and adults (MacDonell and Willoughby 2020; Sergi et al. 2019; Sharma and Nagle 2018). However, to our knowledge, the HEXACO has not yet been used to study parent-child behavior explicitly. Therefore, we conducted an exploratory study using HEXACO personality traits and real-time observations of parent and child play behavior.

Parent and Child Behavior

The behavior of parents and children can influence each other (e.g., Clark, Don-

nellan, and Robins 2018; de Haan, DeKovic, and Prinzie 2012; Lenuga et al. 2019). Various studies suggest that parents and children respond to each other's cues and characteristics, which mutually shape each of their behaviors (Coplan, Arbeau, and Armer 2009; Clark, Donnelian, and Robins 2018; de Haan, DeKovic, and Prinzie 2012). Belsky (1984) was one of the first to explain this in the context of explicit personality traits by suggesting that personality traits of both the parent and the child significantly influence each other's outcomes. This may be especially relevant at the behavioral level because personality traits regulate how individuals perceive, respond to, and behave in various situations (Back, Schmukle, and Egloff 2009). Additionally, as with other dyadic social relationships, the personality traits of one person make up a crucial component of the other person's environment and have important effects on behavior (Asendorpf and Wilpers 1998).

Parents' Personality Traits

How parents perceive and interact with their children by way of parental personality can explain the parent-child relationship (Bahrami et al. 2019). Some researchers have suggested that parents' personality traits may even play a stronger and more consistent role in parent-child interactions compared to children's personality traits, because adult traits are more stable than those of children (Belsky 1984; de Haan, DeKovic, and Prinzie 2011; Prinzie et al. 2009). Compared to previous models of personality (e.g., the "big five"), the HEXACO provides more insight about the adaptive nature of some personality traits. Importantly, the HEXACO highlights how ranking higher or lower for each of the six traits appears advantageous to individuals in different contexts (Ashton and Lee 2007). These theories can also be applied to parenting. For example, the HEXACO's emotionality trait, which ranks high in sentimentality, empathy, and feelings of attachment (Ashton and Lee 2007), may help parents become more attuned to their children's needs and feel more attached to and protective of them.

HEXACO's emotionality trait is composed of four facets: sentimentality, dependence, fearfulness, and anxiety (Lee and Ashton 2004). We suspect that these four facets may be tapping into two different aspects of parenting. For example, previous research suggests that parental responsiveness and involvement and parental anxiety have significantly different outcomes for children

(Belsky, Fish, and Isabella 1991). Thus, parsing the HEXACO emotionality trait as emotionality-attachment (which includes sentimentality and dependence) and emotionality-worry (which includes fearfulness and anxiety) may provide information that will help us understand the underlying parent-child interactions.

Additionally, HEXACO's honesty-humility (being more selfless) and agreeableness (patience and forgiveness) (Lee and Ashton 2004) may also influence parenting because being more selfless and tolerant may help parents prioritize their children's needs and desires over their own. Such traits may also have important effects on the behavior of children (Paulussen-Hoogeboom et al. 2007). As mentioned, for children the personality traits of their parents may be an important environmental feature (Asendorpf and Wilpers 1998). Thus, a child's behavior can be perceived as a response to his or her parent's personality (Bowlby 1960; Dishion and Patterson 1997). Researchers have found that parents who are more sensitive and warmer better understand their children's perspectives and prove more responsive to their children's needs (Reuben et al. 2016). As a result, parents who are warm and sensitive likely promote more positive developmental outcomes in their children, such as independence and sociability (Newton et al. 2014; Patte 2002). Parents' personality traits therefore likely evoke specific behavior in children (Oliver, Guerin, and Coffman 2009).

Child's Personality Traits

Of course, an important contributor to children's behavior may be their own personalities (Back, Schmukle, and Egloff 2009; Zhang et al. 2018). Studies have shown that children who ranked higher for HEXACO's honesty-humility trait exhibited less problematic behavior (MacDonell and Willoughby 2020). Higher rankings for HEXACO's honesty-humility, conscientiousness, and extraversion traits were also associated with accomplishment in school (Sergi et al. 2019). Higher rankings for HEXACO's emotionality and agreeableness related to children's autonomy and social relationships (Sharma and Nagle 2018).

Children's personality traits may also elicit different behaviors and interactions from parents (Haan, DeKovic, and Prinzie 2012), as seen in the literature about temperament. Children with difficult temperaments and poor self-control evoked more negative and harsher parental behaviors (Clark, Donellan, and Rob-

ins 2018; Liu et al. 2019). Children who showed signs of fearfulness and social inhibition elicited overprotective and inconsistent parenting (Coplan, Reichel, and Ronan 2009; Lenuga and Kovacs 2005). Parents may therefore also be shaping their behavior according to children's traits (Armour et al. 2018; Belsky 1984).

Current Study

We explored how parents' and children's HEXACO personality traits influence actual parent and child supervision and play behavior on a playground. Actual observations may reveal important nuances within the parent-child dyad that may help provide a deeper understanding of this complex relationship (Mortensen and Cialdini 2010). We used a person-centered analysis to examine parent and child play behavior to seek insight into how the distinctive configurations of parent and child behavioral patterns relate to the personality variables (Metsäpelto and Pulkkinen 2003). Additionally, we chose to conduct our observations on a playground because it allowed us to observe parents in a public setting where parents and children are already accustomed to being watched. We restricted our participant sample to parents who had children between six and ten years of age because this is likely the stage when early personality traits begin to manifest as a result of significant changes in childhood social structures (Caspi and Moffitt 1993).

We predicted that parents who ranked higher for emotionality-attachment would be more engaged and involved in their parenting. We also predicted that children who showed greater levels of conscientiousness—and therefore were less likely to be impulsive and difficult—would elicit more interactive parenting. With regards to children's play, we predicted that parents who ranked higher for emotionality-attachment, but not emotionality-worry, would have children who exhibited more socially valued child behaviors such as sociability and creativity in their play (Savelieva et al. 2017). We predicted that children with greater levels of extraversion, conscientiousness, and agreeableness would also display these socially valued child behaviors in their play, given that these traits are associated with better psychosocial functioning (Vanhalst et al. 2013), social relationships (Ciarrochi and Heaven 2009), less problematic behavior (De Fruyt et al. 2008), and creativity (Baas et al. 2013). Finally, we predicted that children who ranked higher for emotionality-attachment and emotionality-worry would seek more contact with their parents.

Method

Participants

We recruited one hundred parent-child dyads (seventy-one mothers and twenty-nine fathers) from a local park in Southern Ontario. The majority of the parents reported to be between thirty-one and forty years of age (54 percent); 18 percent reported to be between twenty-one and thirty years; 26 percent, between forty-one and fifty years; and 2 percent above fifty-one years.

Compared to the average Canadian, the majority of participants reported they were of the same wealth (65 percent); 2 percent reported they were a lot less wealthy; 13 percent reported they were less wealthy; 18 percent they were wealthier; and 1 percent reported they were a lot wealthier. A majority of the participants were married (61 percent); 18 percent said they were in a relationship; 4 percent were divorced; and 16 percent were single. A majority of the participants described themselves as Caucasian (82 percent) while the rest of the sample said they were Black, Asian, Indigenous, Hispanic, or Other. The average age of the children in our sample was 7.34 years old ($SD = 1.26$) and 52 percent were boys.

Measures

Observations of Parent Behavior

Based on qualities that have been previously suggested to be important dimensions of parenting (e.g., Lotzin et al. 2015) and using Likert scales ranging from one to seven (extremely low to extremely high), we measured five parenting behaviors: communication (i.e., speaking with the child); affection (i.e., physical displays such as hugging, kissing or patting); monitoring (i.e., showing an awareness of the child's location during our observation); interaction with child (i.e., playing, helping, or feeding the child); and sitting on their own. These observations were conducted by two trained researchers to reduce subjective biases in observations. Observations from both researchers were averaged for the analysis. The interrater reliability using Cohen's κ was excellent across all measured behavior (Altman 1999): $\kappa = .84, p < .01$ for communication; $\kappa = .88, p < .01$ for affection; $\kappa = .81, p < .01$ for monitoring; $\kappa = .87, p < .01$ for interaction with child; $\kappa = .91, p < .01$ for sitting on their own on.

Observations of Child Play Behavior

Using Likert scales ranging from one to seven (extremely low- extremely high), we measured six types of observable child behaviors on the playground: extraversion (e.g., interacting and playing with other children), independence from parent (e.g., less running back to parent), level of energy (e.g., lots of running across the playground), contact seeking (e.g., frequently running back to parent), creativity (e.g., playing with park equipment in creative ways), and prudence (e.g., playing cautiously with less risky behavior). These observations were conducted by two researchers to reduce subjective biases in observations. Observations from both researchers were averaged for the analysis. The interrater reliability for using Cohen's κ was, again, excellent across all the measured behavior (Altman, 1999): $\kappa = .93, p < .01$ for extraversion; $\kappa = .74, p < .01$ for independence from parent; $\kappa = .79, p < .01$ for level of energy; $\kappa = .80, p < .01$ for contact seeking; $\kappa = .73, p < .01$ for creativity; and $\kappa = .82, p < .01$ for prudence.

Parents' Personality Traits

Parents completed the twenty-four-item Brief HEXACO Inventory self-report (De Vries 2013). The inventory consisted of six factor-level scales of personality. Each factor included four items on a Likert scale ranging from one to five (strongly agree to strongly disagree). Sample items include: "I find it difficult to lie" for honesty-humility; "When it comes to physical danger, I am very fearful" for the fearfulness factor of emotionality; "I sometimes can't help worrying about little things" for the anxiety factor of emotionality; "When I suffer from a painful experience, I need someone to make me feel comfortable" for the dependence factor of emotionality; "I feel strong emotions when someone close to me is going away for a long time" for the sentimentality factor of emotionality; "I like to talk with others" for extraversion; "Even when I'm treated badly, I remain calm" for agreeableness; "I make sure that things are in the right spot" for conscientiousness; and "I like people with strange ideas" for openness to experience.

Children's Personality Traits

Parents also completed a modified observer report of the Brief HEXACO Inventory to rate their children's personality traits. The reliability coefficients for each personality factor for this measure are known to be low due to the low number of items for each personality factor. However, this measure is shown to have strong predictive value (de Vries 2013).

Procedure

After we received clearance from the university's research ethics board, we approached parents at a local park and provided them with a brief verbal description of the study. We used incomplete disclosure by telling parents that we were observing children's play behavior to keep parents' behavior from becoming skewed (e.g., extremely positive parenting) because the parents knew that their behavior was being observed. We also asked participants if they or their children had any diagnoses or disorders. Those who reported any type of diagnoses or disorders (e.g., autism spectrum disorder) were not included in the study because our aim was to examine typical parent-child dyads.

After parents agreed to participate in the study and confirmed their children's ages, two researchers conducted twenty-minute observations of parent and child play behavior while the parents filled out the questionnaires. The researchers asked parents and their children to do what they normally would do when they came to the park. The park included two playgrounds (with jungle gyms, slides, swings, and teeter-totters) and a splash pad. Grass covered large areas of the park, and benches offered places to sit on its perimeter. Children engaged in solo play, play with other children at the park, and play with their parents. In terms of play behavior, children engaged in a variety of physical and imaginative play. All researchers had been previously trained to conduct observations using sample parents and children at the park. The study lasted approximately twenty-five minutes (we started our observations five minutes after obtaining parent and child consent to allow enough time to prevent the children from becoming aware they were being observed). Participants received ten dollars cash for their participation.

Results

All our variables met criteria for missingness, univariate assumptions, and multivariate assumptions (Tabachnick and Fidell 2013). We conducted four latent profile regressions models using MPlus version 8.4 (a software program for analyzing data) in order to examine types of parent and child behavior at the park. Latent profile analysis holds that responses to a set of observed behaviors indicate an underlying latent variable with a finite number of mutually exclusive profiles or subtypes (Muthén and Muthén 2006). We used this model to create

a more global measurement for observing parenting and child behavior, and then we regressed the parenting and child behavior styles using four models of parent and child personality traits. Two of the regressions concerned parental behavior, using each model of parent and child personality traits. The other two concerned child behavior, using each model of parent and child personality traits. Given our smaller sample, we did not conduct highly complex statistical analyses or compare differences between mothers and fathers. But, notably, our sample size does not appear to be a concern for latent profile analysis (Tein, Cox, and Cham 2013).

Correlations

Pearson r correlations showed that the self-reported emotionality-attachment of parents related to sitting less often on their own, to more monitoring, and to a higher ranking for child prudence. The self-reported extraversion of parents also related to a higher ranking for child prudence. The self-reported conscientiousness of parents was related to lower rankings for child creativity and prudence (see figure 1).

The extraversion that parents reported for their children related to the children's extraverted behavior on the playground. The conscientiousness that parents reported for their children related to a higher ranking for parent communication and parent affection, and also to parents sitting less often on their own, to higher rankings for parent interaction and parent monitoring, to children more often contact seeking from parents, and to children showing less independence from parent (see figure 1).

Latent Profile Regression Model

PARENTING BEHAVIOR. Our latent profile analysis showed two profiles of parenting behavior, $LMR = -975.752$, $p = .00$, adjusted $LMR = 321.52$, $p = .01$; bootstrapped likelihood ratio test = -975.75 , $p = .00$ (Tein, Coxe, and Cham 2013): a more engaged parenting behavior (34.71percent), in which parenting behavior ranked high on communication, affection, interaction with child, and monitoring and a less engaged parenting behavior (62.29 percent), in which parenting behavior ranked high on parents sitting on their own.

In the latent profile regression model, we also examined the relationship

between parent and child personality traits independent of parenting behavior using two logistic regressions. Our results showed that the self-reported emotionality-attachment of parents related to more engaged parenting behavior ($B = .76, p = .03, \text{odds ratio} = .47$). The conscientiousness parents reported of their children also related to more engaged parenting behavior ($B = .81, p = .03$).

CHILD BEHAVIOR. Our results showed two profiles of child play behavior, $LMR = -1107.52, p = .00$, adjusted $LMR = 125.95, p = .01$; bootstrapped likelihood ratio test = $-1107.52, p = .00$ (Tein, Coxe, and Cham 2013): an autonomous, energetic play (70.71 percent), in which children ranked high on extraversion, independence from parents, and energy and an introverted, cautious play (27.29 percent), in which children ranked high on seeking contact from parents, creativity, and prudence.

We also conducted two logistic regressions with the latent profile regression model to examine the relationship between parent and child personality traits independent of child play. We did not find any significant associations between parent personality and child play behavior. However, we found that children whose parents ranked them higher for extraversion were more likely to belong to the autonomous energetic play group ($B = 1.22, p = .06, \text{odds ratio} = 3.38$) and that children whose parents ranked them higher for conscientiousness were more likely to be related to the shy or dependent group ($B = -.67, p = .09, \text{odds ratio} = .51$). These results were not significant using our initial two-way analyses, but we note that they would have been if we had chosen a one-way analysis consistent with our initial hypotheses. We therefore cautiously note a potentially meaningful statistical trend toward relationships between child personality and play-group membership. Given that there is an ad-hoc element to discussing these relationships as trending toward significance, we emphasize the need to treat our specific findings cautiously (Matsunanaga 2007; Rubin, 2017; Vigden and Yasseri 2016).

After our initial analyses, we ran parent and child personality traits together in order to explore whether our initial results would hold when we controlled of each other's personality traits. When we placed parent and child personality traits together in the same model to predict parenting behavior, we found that parent personality traits were no longer significant. However, the conscientiousness parent reports of their children still predicted more engaged parenting behavior ($B = .94, p = .03, \text{odds ratio} = 2.56$). Additionally, when we placed parent and child personality traits together in the same model to predict child

play behavior, we found that parent personality traits were still not significant but that higher rankings for extraversion ($B = 1.48, p = .02$, odds ratio = 4.33) and lower rankings for conscientiousness ($B = -.94, p = .02$, odds ratio = .39) from parents of their children predicted autonomous energetic play behavior. This replicates the marginally significant findings presented in previous paragraphs, giving us more confidence in the likelihood of the links between child personality and play behavior.

Discussion

The purpose of our study was to explore whether parent and child HEXACO personality traits influenced actual parent and child play behavior on a playground. We separated the HEXACO emotionality trait into emotionality-attachment (which includes sentimentality and dependence) and emotionality-worry (which includes fearfulness and anxiety) to better understand the underlying factors related to parenting behavior. Our study supported this distinction between the two in the context of parenting. Most of our findings on the links between personality and play behavior in parents and children also proved consistent with our predictions.

To begin with, our observations of parent and child behavior depicted two types of behavioral patterns on the playground. One parenting style entailed engaged parents. These parents spent more time watching, talking to, and playing with their children. These behaviors resemble the grouped characteristics of the authoritative parenting style, which includes high rankings for communication, nurture and affection, and discipline (the latter similar to the monitoring behavior observed in our study) (Baumrind 1967). The second parenting style that we observed in the majority of the parents entailed a less involved parenting style. This second group of parents were more hands-off and generally let their children explore and play on their own.

We also found two child play behavioral styles on the playground. The first group of children were more interactive with other children, less dependent on parents, and more energetic in their play. We labelled this group as engaging in autonomous, energetic play. Similar to our findings, sensation seeking and extraversion have also been grouped together in previous behavioral studies (Glicksohn, Naffuliev, and Golan-Smooha 2007). Additionally, high levels of energy have been frequently associated with extraversion (Cullen-Lester et al.

2016). The second group of children were more dependent on their parents, showed more creativity in their play, and were more careful in their play. We labelled this group as engaged in introverted, cautious play. Previous studies have shown similar associations between emotionality and emotional dependence and higher prudence (Delgado-García et al. 2010). Overall, similar findings from previous studies provide theoretical validity for our parent and child behavior configurations and further strengthen our parent and child behavioral groups.

Next, we found that parents who reported higher levels of emotionality-attachment belonged to the more engaged parenting group. Previous observational studies have similarly found that parents who were more affectionate more often engaged in interactive play (Langlois et al. 1995). Thus, parents with a tendency to seek emotional support from others and to feel strong emotional bonds with others may more often engage and interact with children on playgrounds. These parents may also feel more sentimental toward family members (Lee and Ashton 2004). We did not find any associations between emotionality-worry and parenting behavior in our study, possibly because our playground offered a relatively safe environment and may not have elicited much worry from parents. Perhaps had we conducted our observations in a crowded theme park or in a different, higher-risk area there would have been a greater need for worry (e.g., of a child getting lost, or being scared, or getting injured), and we may have found significant links between parent behavior and emotionality-worry. Therefore, our split of HEXACO's emotionality appears to have been useful, but we must urge caution against a general application of this finding.

Children's personality traits also predicted parents' behaviors. Children who rated higher for conscientiousness had more engaged parents. This finding was also significant in our post hoc analysis that examined parent and child personality traits together to predict parenting behavior. In fact, children's conscientiousness was the only significant parent or child personality trait that predicted parenting behavior in the post hoc analysis. This fits with the pattern of results in previous studies that have found less difficult children (measured through temperament) related to more involved parenting behavior (Clark, Donnellan, and Robins 2018; Liu et al. 2019). Yet it seems somewhat counterintuitive for parents to feel the need to engage and interact with children who are more cautious and less impulsive. This might be so because involved parents raise more conscientious children (Kochanska, Murray, and Harlen 2000; Van Heel et al. 2019). Another explanation might hold that parents feel a need to intervene by encouraging cautious children to engage in play. This explanation highlights the

potential bidirectionality of parent-child personality traits and should be more thoroughly investigated in future studies.

In terms of children's play behavior, we found that children rated higher for extraversion trended toward more autonomous, energetic play. This may be so because extraverted children are more social, less withdrawn, and more likely to enjoy playing with other children (Davydenko et al. 2020; Lee and Ashton 2004). We also found that children rated higher for conscientiousness trended towards shy and dependent play behavior. This fits with research showing that conscientious children are more likely to demonstrate caution and less impulsive play behavior (Berk and Meyers 2013; Eisenberg et al. 2014). We found the same pattern of results in our post hoc analysis, in which we examined parent and child personality traits together.

We did not find any associations between children's emotionality-attachment or emotionality-worry and seeking contact with their parents. Again, this may be so because the playground setting does not trigger any of the attachment- or worry-related children's personality traits when parents are always within sight on the playground. Similarly, our finding of no relationships between parents' personality traits and children's play behavior may also be explained in the context of the playground. Children's behavior on the playground, which mostly involves active play, may be less driven by parents' personality traits compared to children's own personality traits. Had we measured a more interactive form of play, parents' personality traits may have played a larger role.

Finally, as mentioned, our post hoc analysis showed that children's personality traits had a larger effect on parent and child playground behavior than on parents' personality traits. Although this makes intuitive sense for children's play behavior, we surprisingly found that children's personality mattered more even for parenting behavior than for parent's personality traits. However, it appears that few other studies have found similar patterns when they examined both parent and child personality traits as they relate to children's behavior (Bates et al. 2012; Clark, Kochanska, and Ready 2000; de Haan, DeKovic, and Prinzie 2012; Oliver, Guerin, and Coffman 2009; Wilson and Durbin 2012). As children grow older, parental influence on their behavior may become more complex and less directly related. Other environmental factors may interact with parental influence to predict children's behavior (Wachs 2000). Perhaps a moderation or mediation analysis with a larger sample could reveal these complex associations.

Limitations

It is worth noting that our sample size was too limited to test for small effects or complex interactions. However, previous studies that directly observed parent and child behavior used similar-sized or smaller samples (e.g., Clark, Kochanska, and Ready 2000; Hawes and Dadds 2006; Slatcher and Trentacosta 2011). We were also unable to test for different effects based on the gender of parent or child and thus leave it to future research to determine if there are indeed different patterns (e.g., if women tend to have higher emotionality scores than men). Additionally, given the playground we used in our study, we were unable to test for how HEXACO's emotionality-worry may be associated with parenting or how emotionality-attachment and worry may be associated with children's behavior and interactions with their parents. Since ours is the first study to separate HEXACO's emotionality into attachment- and worry-related traits, future studies may consider replicating our findings in other contexts to discover how these two aspects of emotionality may be related to parent and child behavior. More specifically, in what other contexts would attachment- and worry-related traits benefit or hinder parenting and parent-child behavior? This might require the use of the full-length version of the HEXACO (one hundred items), which was not feasible in our study given our time constraints (i.e., parents could not fill out two hundred questions while at the park). The playground environment also limited the examination of more in-depth parent-child interactions and their associations with parent and child personality traits. Future studies may want to use a more interactive context to parse how personality traits influence parent-child interactions.

Conclusion

Given these limitations, our study takes a first look at how the HEXACO can explain parent-child interaction and children's play behavior on the playground but requires further exploration. Our results suggest that some parent and child personality traits may be associated with parent-child play engagement and behavior. Given the importance of play for children's social and physical development, our findings can provide information to help children engage in different types of play. Our findings can also help all parents make a more conscious effort to promote different types of play for their child, especially for parents who may

not exhibit high levels of the sentimental- and attachment-related personality traits. Overall, our findings may help identify ways to help children who have difficulty establishing strong attachments with their parents, with making friends, and with engaging in other social behavior on the playground.

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