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Validity Evidence for the Security Scale as a Measure of Perceived Attachment Security in Adolescence

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A key individual difference measure in developmental psychology is the nature of an individual's *attachment*. Attachment theory posits that early experiences with the primary caregiver influence beliefs and expectations about the availability and responsiveness of significant others (Bowlby, 1969). These beliefs and expectations are carried forward in development and guide behavior and affect in social relationships across childhood, adolescence, and adulthood (Ainsworth, 1989; Carlson, Sroufe, & Egeland, 2004; Sroufe & Fleeson, 1986). In general, a "secure" attachment is more prognostic of healthy development (Sroufe, 2005).

Attachment researchers have developed a diverse set of assessments that capture aspects of attachment at various points in development. Attachment in infancy is commonly measured via the Strange Situation, which examines infant behavior during separations and reunions with the caregiver (Ainsworth, Blehar, Waters, & Wall, 1978). In late adolescence or adulthood, internal representations of early experiences with caregivers (attachment "state of mind") are assessed via the Adult Attachment Interview (AAI; George, Kaplan, & Main, 1996), a semi-structured interview that categorizes individuals based upon the coherence of their narrative. There is no general agreement, however, regarding the assessment of attachment in childhood and adolescence. One approach is to observe behavior in separation and reunion scenarios in order to evaluate the ability of the child to use the caregiver as a secure base (Main & Cassidy, 1988). Another approach is to interview the child in a manner similar to the AAI (e.g., the Attachment Interview for Childhood and Adolescence or AICA; Ammaniti, van IJzendoorn, Speranza, & Tambelli, 2000). Some measures, such as the MacArthur Story Stem Battery (Green, Stanley, Smith, & Goldwyn, 2000), ask children to elaborate on stories of family situations that may evoke attachment behavior, while other measures ask children to respond to pictures of separation from caregivers (i.e., the Separation Anxiety Test; Main, Kaplan, & Cassidy, 1985). Many of these measures have some validity evidence for children of specific ages using theoretical correlates of attachment security, which include parental responsiveness, social behavior in close relationships, emotion regulation, and social competence (Sroufe, 1988; Sroufe, Carlson, & Shulman, 1993; Sroufe & Fleeson, 1986). However, few measures have been validated across both childhood and adolescence using criteria such as multi-informant reports and observations of social behavior and affect (Crowell, Fraley, & Shaver, 2008; Dwyer, 2005).

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One measure that possesses a degree of validity evidence for use with children aged 9–12 (3rd to 6th grade) is the Security Scale, a self-report questionnaire that assesses children's perceptions of attachment to specific caregivers. The development of the Security Scale was guided by the secure-base phenomenon, and thus perceived attachment security was operationalized as the degree to which a child believes that a particular attachment figure is responsive and available during times of stress. In initial testing, scores on the Security Scale demonstrated high test-retest stability ($r = .75$, Median duration=14 days), and children reporting a higher degree of perceived security received greater "liking" ratings from peers, were involved in more reciprocal friendships, and had mothers reporting a greater willingness to serve as a secure base; in addition, secure friendship dyads were rated as more responsive and less critical of one another by observers (Kerns, Klepac, & Cole, 1996). More recent validity evidence includes significant associations between scores on the Security Scale and other measures of attachment, such as story completion (Granot & Mayseless, 2001) and the response to pictures of separation (Kerns, Tomich, Aspelmeier, & Contreras, 2000). Security Scale scores have also been linked to higher levels of social competence (Booth-Laforce et al., 2006; Contreras, Kerns, Weimer, Gentzler, & Tomich, 2000) and superior emotion regulation and more constructive coping at school (Contreras et al., 2000; Kerns, Abraham, Schlegelmilch, & Morgan, 2007).

Attachment research suggests that parents continue to act as a secure base during adolescence and beyond (Fraley & Davis, 1997; Trinke & Bartholomew, 1997), so the Security Scale's emphasis on the secure base phenomenon implies that it may be able to assess perceived attachment security for adolescents as well as for younger children. Thus far, however, very little validity evidence has emerged that focuses on fundamental aspects of attachment in adolescence, such as parent-youth interactions and social competence with peers. This is a crucial distinction, given the changes in parent-child and peer relationships that occur during adolescence. Specifically, increased behavioral and emotional autonomy from parents during adolescence require a re-negotiation of parent-adolescent boundaries and roles (Steinberg, 1990), and the maintenance of a secure attachment to parents in adolescence requires not only parental responsiveness but also the provision of increased autonomy and the negotiation of conflicts while maintaining a warm, supportive relationship (Allen & Land, 1999). In addition, peer relations in adolescence are more complex and intimate than in childhood, requiring a wider array of skills, including empathy, perspective-taking, and the ability to negotiate (Buhrmester, 1990; Buhrmester & Furman, 1987). To be considered as a valid measure of perceived attachment security in adolescence, the Security Scale must be linked to constructs such as these.

Current study

The goal of this study is to examine the validity of the Security Scale as a measure of perceived attachment security for adolescents. We focus on both convergent and predictive validity, which concerns the ability of a measure to predict (1) established measures of the same or similar constructs, and (2) measures of theoretically related constructs (Shadish, Cook, & Campbell, 2002). We will use Security Scale scores to predict (1) scores on an established self-report measure of perceived attachment security, and (2) parent-adolescent interactions and social competence, both of which are important theoretical correlates of attachment security. If evidence for validity is found, this would provide developmental psychologists with a tool with which to assess perceptions of attachment security across both childhood and adolescence, increasing the likelihood that advances in this area of inquiry can be made. Below we discuss the theoretical and empirical links between attachment and each of the correlates used in this study.

Parent-adolescent interactions—Attachments to parents in infancy form the basis for the development of beliefs and expectations related to close relationships. Although some attachment functions may be transferred to peers in adolescence, parents continue to be among the most important attachment relationships, particularly in stressful situations that can tax an adolescent's coping ability (Fraley & Davis, 1997; Trinke & Bartholomew, 1997).

Relatively little research has examined the link between attachment and parent-adolescent interactions, although Allen et al. (2003; 2007) found that security (as assessed by the AAI) was associated with observational measures of parent-adolescent interactions in conflict situations, coded using the Autonomy and Relatedness Coding System (ARCS; Allen, Hauser, Bell, McElhaney, & Tate, 2003). In particular, adolescent attachment security was positively associated with family behaviors that *promoted autonomy and relatedness* and negatively associated with behaviors that *undermined relatedness* (but was not linked with behaviors that *undermined autonomy*). To be a valid measure of perceived attachment security, Security Scale scores should demonstrate a similar pattern of associations with parent-adolescent interactions.

Social competence—Theoretical links have been drawn between attachment security and general social competence. According to theory, secure children and adolescents are more empathic with others, more skilled at reading social situations and resolving conflicts, and, in turn, are better able to establish and maintain friendships when compared to insecure children (Sroufe et al., 1993). These social skills are often the result of parental modeling of appropriate strategies for negotiation, conflict resolution, and mutual reciprocity (i.e., the attainment of a “goal-corrected partnership”; Allen & Land, 1999). In addition, securely attached child are better able to use caregivers as a “secure base” from which to explore the social world, thus creating more opportunities to learn socially competent interaction styles.

Research supports the link between attachment and social competence. Attachment in infancy as assessed by the Strange Situation has been linked to general social competence in childhood (Fagot, 1997), and attachment representations assessed via the AAI have been linked to social competence in adolescence (Allen et al., 2007). Thus, to be a valid measure of perceived attachment security, Security Scale scores should predict measures of social competence, with greater perceptions of security linked to greater social competence.

Hypotheses

To provide a thorough test of the validity the Security Scale and reduce the influence of shared method variance, we will predict concurrent *observational* measures of parent-child relationships and *parent- and teacher-reported* social competence, as well as *future* measures of self-reported attachment security. In addition, to ensure that the Security Scale is not simply tapping general positive affect toward parents or perceptions of parental supportiveness, we will control for the effects of the Inventory of Parent and Peer Attachment (IPPA; Armsden & Greenberg 1987), a widely used measure of the parent-child relationship (in terms of trust, alienation, and communication). Scores on the IPPA have been linked to levels of family support, conflict, and cohesiveness (Armsden & Greenberg 1987) as well as to attachment correlates such as social competence and socio-emotional adjustment (e.g., Laible, 2007; Larose & Boivin, 1998). Although some view the IPPA as a measure of perceived attachment, others argue that the IPPA assesses parent-child relationship qualities that are only peripherally related to the secure base phenomenon, and thus the IPPA is more properly viewed as a broader measure of the quality of the parent-child relationship rather than a specific measure of attachment (Heiss, Berman, & Sperling, 1996). If the Security Scale is indeed assessing specific beliefs and behaviors that are closely

related to the secure-base phenomenon, it should be a better predictor of attachment-related constructs when compared to the IPPA. Thus, we hypothesize that perceived attachment security to the mother as measured by the Security Scale (at age 14), after controlling for mother-child relationship quality as measured by the IPPA, will be (1) positively associated with adolescent and maternal behaviors *promoting autonomy and relatedness* (i.e., autonomous relatedness) and negatively associated with behaviors *undermining relatedness* during a disagreement at age 14 (but not linked to behaviors *undermining autonomy*, given that these links were not found in Allen et al., 2003, 2007); (2) positively associated with a combined measure of mother, father, and teacher-rated social competence at age 14; and, (3) associated with a self-report measure of perceived attachment security at age 17. Further, we hypothesize that the Security Scale will demonstrate significantly stronger links than the IPPA.

Method

Participants

Participants were part of a longitudinal study using a community sample ($N = 373$). Two cohorts were originally recruited from a medium-sized city in the Pacific Northwest. Cohort 1 was recruited via advertisements in local newspapers, mailed newsletters, and flyers posted in public areas throughout the community. All families with 18-month-old children were invited to participate. The resulting sample ($n = 166$) matched the family size, income, and occupational status statistics of the local area. When the children in Cohort 1 reached age 5, a second cohort of 5-year old children ($n = 207$) was recruited using the same procedures as with Cohort 1. Sample retention rates remained high throughout the study; data were collected on 97% of the original sample ($n = 363$) at the final assessment (age 17). The current analyses only include data collected at ages 14 and 17. The analytic sample was 88% Euro-American, 7% mixed ethnic background, 2% Hispanic, 1% African American, 1% Native American, and 1% Asian American. The mean parental educational level was “at least 1 year at a 4-year college”, and the mean parental employment level was 6 (i.e., technicians, semi-professionals, or small business owners) on the Hollingshead (1975) 9-level occupational schedule. The median family income level was \$50–60K per year (1998–2001; range: <\$5K/year to >\$100K/year). The mean ages for mothers and fathers were 45 and 48, respectively (ranges: 33–57 and 36–64 years).

Measures

Security Scale—At age 14, adolescents completed the Security Scale (Kerns et al., 1996), a 15-item questionnaire assessing their perception of attachment security to their mother. Subjects rated whether one of two statements was *sort of true for me* or *really true for me*. The two statements were presented as one item in a forced-choice format developed by Harter (1982) to minimize response bias due to perceptions of social desirability (e.g., “Some kids find it easy to trust their mom BUT other kids are not sure if they can trust their mom”). Each item was scored from 1 to 4, with a higher score indicating greater perceptions of security. Items were averaged ($\alpha = .87$), with larger scores indicating greater security with their mother.

Inventory of Parent and Peer Attachment—At age 14, adolescents completed the IPPA (Armsden & Greenberg, 1987), a 25-item questionnaire that assesses the youth’s attitude about the quality of his/her maternal relationship. Youth respond to each item using a 5-point scale from 1 [*Never*] to 5 [*Always*]. As per scale instructions, items are summed to create three subscales (trust, communication, and alienation), which are then combined into a summary score (trust plus communication minus alienation; overall $\alpha = .88$).

Parent-adolescent interactions—At age 14, adolescents and their parents took part in a 15-minute problem-solving task. The family attempted to resolve three family issues that are currently problematic to many families with adolescents (e.g., curfew, grades, talking on the phone, etc.). The issues were randomly selected specifically for each family based on parent and youth responses on an Issues Checklist (Robin & Foster, 1989), which lists common family issues and asks respondents to indicate whether each has occurred and how heated the discussion was. The family's interactions were videotaped and coded using the Autonomy and Relatedness Coding System (ARCS; Allen et al., 2006). The coding system yields ratings for (1) the adolescent's behavior toward his or her parents in the interaction, (2) the mother's behavior toward the adolescent, and (3) the father's behavior toward the adolescent. Ratings correspond to behaviors across the entire interaction, and these scores are derived from an anchored coding system that considers both the frequency and intensity of each speech during the interaction. Specific interactive behaviors were coded and then summed together into primary scales for (a) *promoting relatedness*, which captures validating statements and displays of engagement and empathy with others; (b) *undermining relatedness*, which taps overt expressions of hostility toward others and the interrupting/ignoring of others; (c) *promoting autonomy*, which captures use of a reasoned style and a calm, confident tone in the discussion; and (d) *undermining autonomy*, which captures overpersonalizing a disagreement, recanting a position, or pressuring another person to agree without making rational arguments. As per scale instructions, the subscales for promoting autonomy and relatedness were combined to yield a single scale for *autonomous relatedness*. Each family member was assigned scores in each category.

Approximately one quarter of the videotapes (79 out of 327, or 24.2%) could not be coded due to poor sound quality. Three-quarters of the remaining interactions were selected at random for coding ($N=185$ out of 248). Coders were blind to the purposes of the study. The team was trained by an authorized instructor and achieved an inter-rater reliability (intraclass correlation) of .71 before the start of coding (trainer's ratings included). Once coding began, all interactions were single-coded, but a random sample of 10 interactions was dual-coded; the inter-rater reliability (intraclass correlation) of these codes was .80 (trainer's ratings included).

Social competence—When the adolescents were 14, parents and teachers used the Peer-preferred Social Behavior subscale of the Walker-McConnell Scale of School Competence and School Adjustment (Walker & McConnell, 1988) to rate the quality of the youth's social competence (e.g., whether the youth "shows sympathy for others" and "is able to read social situations accurately"). Parents and teachers indicated the degree to which each item was true from 1 [*Never*] to 5 [*Frequently*]. Scores on all 17 items are averaged ($\alpha = .93$ for mother and father and $\alpha = .92$ for teachers) with larger scores indicating greater social competence.

Adult Attachment Scale—At age 17, adolescents completed the Adult Attachment Scale (AAS; Collins & Read, 1990), an 18-item measure of perceived general attachment security (i.e., not associated with a specific individual). Youth rated the extent to which each statement described their feelings on a scale ranging from 1 [*not at all characteristic*] to 5 [*very characteristic*]. The instrument contains three subscales: Dependence (e.g., "I am comfortable depending on others"), Anxiety (e.g., "I find others are reluctant to get as close as I would like"), and Closeness (e.g., "I find it relatively easy to get close to others"). Individual items were summed to create subscale scores. Cronbach's alpha for the subscales were .81, .71, and .69, respectively. Higher scores indicate greater perceived security (i.e., greater comfort depending on and being close to others and less anxiety). In previous research, individuals classified as "secure" (according to other established measures of

attachment) scored higher on the Dependence and Closeness subscales and lower on the Anxiety subscale (Collins & Read, 1990).

Analysis Plan

We simultaneously evaluated all links between measures of perceived attachment and related constructs using Structural Equation Modeling (SEM). The parent- and teacher-report social competence measures were combined into a latent variable. We initially fit a model without the Security Scale to evaluate the ability of the IPPA to predict all dependent variables (Model 1), and then added the Security Scale (Model 2) and compared the predictive strength of the IPPA and the Security Scale by sequentially constraining each pair of paths to be equal for each dependent variable and conducting a chi-square difference test; a significant result indicated that the predictive power of the IPPA and Security Scale were different. The models were fit with AMOS 7.0 (Arbuckle, 2006) using Maximum Likelihood (ML) estimation. Little's test (Little, 1988) was not significant [$\chi^2(264) = 240.83$, *ns*], indicating that the missing data mechanism was random and thus should not create bias. Standard measures of fit are reported, including chi-square (χ^2), comparative fit index (CFI), Tucker-Lewis index (TLI), and root-mean squared error of approximation (RMSEA). CFI values greater than .95, TLI values greater than .90. RMSEA values less than .05, and a non-significant χ^2 (or a ratio of $\chi^2/df < 3.0$) indicate adequate fit (Bentler, 1990; Bentler & Bonett, 1980; Hu & Bentler, 1999).

Results

Means, standard deviations, and intercorrelations are presented in Table 1. Model 1, with only the IPPA, demonstrated good fit [$\chi^2(47) = 73.58$, $p < .01$, $\chi^2/df = 1.57$, CFI = .96, TLI = .91, RMSEA = .04 (.02|.05)] and model coefficients are presented in Table 2. The IPPA significantly predicted undermining relatedness in the parent-child interaction at age 14, but was not able to predict autonomous relatedness or undermining autonomy. The IPPA was able to predict social competence at age 14 and the subscales of the Adult Attachment Scale (AAS) at age 17.

In Model 2, the Security Scale was added as a predictor. The model again demonstrated good fit [$\chi^2(49) = 79.46$, $p < .01$, $\chi^2/df = 1.62$, CFI = .96, TLI = .92, RMSEA = .04(.02|.05)] and model coefficients are presented in Table 2 along with path comparisons. The Security Scale was able to predict both autonomous relatedness and undermining relatedness for both mothers and adolescents, as well as social competence at 14 and the subscales of the AAS at 17, over and above the effects of the IPPA. Chi-square tests indicated that the Security Scale was a stronger predictor of autonomous relatedness, undermining relatedness, and social competence when compared to the IPPA; there were no significant differences for the subscales of the AAS.

Discussion

The results of this study provide validity evidence for the Security Scale as a measure of perceived attachment in adolescence. With regards to predictive validity, our hypotheses were confirmed in that the Security Scale was significantly associated with fundamental aspects of attachment, including parent-adolescent interactions during conflict and social competence. With regards to convergent validity, our hypotheses were again confirmed in that the Security Scale was associated with all subscales of the Adult Attachment Scale (i.e., dependence, anxiety, and closeness) measured 3 years later. The Security Scale demonstrated these associations even when controlling for a broader measure of parent-child relationship quality (the IPPA). Finally, chi-square difference tests indicated that, except for the AAS subscales, the Security Scale was a significantly stronger predictor, suggesting that

the narrow “secure-base” focus of the Security Scale was more effective at predicting specific attachment-related social behaviors. The non-significant chi-square results for the AAS subscales failed to confirm our hypotheses and may be due to shared method variance, given that the Security Scale, IPPA, and AAS are all self-report survey measures. Alternatively, the Security Scale, IPPA, and AAS may be tapping different but overlapping aspects of the adolescent personality. Finally, neither the Security Scale nor the IPPA was able to predict measures of “undermining autonomy” (interestingly, neither was the AAI; Allen et al., 2003); this may reflect either a limitation in the ARCS or in the various measures of attachment. All of these hypotheses represent intriguing topics for future research.

Our findings extend the age range with which the Security Scale can be used, and the longitudinal nature of these data and the independent ratings of adolescent behavior add strength to these findings. Our results suggest that, unlike adult measures of attachment (e.g., the AAI), the Security Scale can be used with both children and adolescents. Further, unlike childhood measures of attachment (e.g., the Separation Anxiety Test), the Security Scale possesses validity evidence for use with adolescents. The Attachment Interview for Childhood and Adolescence is also suitable for both children and adolescents, but given the cost and complexity of interview-based measures, the Security Scale may be a viable low-cost alternative for larger samples.

These results have significant implications for the study of child and adolescent development. Although attachment continuity and change has been extensively studied within infancy, childhood, adolescence, and adulthood, very little research has focused on stability and change across the transition between childhood and adolescence. This gap in the research is particularly noteworthy given the developmental changes that arise during this period (e.g., shifting relationships with parents, emergence of peers as a key influence, pubertal changes, etc.) and their links to both attachment and adjustment. For example, attachment security in early adolescence has been linked to social competence, depression, and externalizing behavior (Allen, Moore, Kuperminc, & Bell, 1998; Allen et al., 2007). Our findings, and the extant literature on attachment, suggest that the Security Scale can be used in future longitudinal research to explore reciprocal links between attachment security and important developmental issues such as relationships with family, peers, and romantic partners, puberty and related biological changes, delinquent and prosocial behavior, and psychological adjustment. Such research would not only extend our knowledge of development but could spur the creation of broader, more integrated approaches to adolescent and family intervention, which generally do not consider attachment.

Limitations and conclusion

This study contains several limitations. Our sample was primarily Euro-American, and the Security Scale measure referred to the mother only, which limits the generalizability of the results. Additional research with at-risk and/or minority samples would be beneficial, as would research that considers attachment to the father. A key limitation of the Security Scale is that it cannot differentiate among types of insecurity (i.e., “preoccupied” vs. “dismissing”). As a result, some research has paired the Security Scale with other measures (see Kerns et al., 2000).

In conclusion, these results provide preliminary evidence for the validity of the Security Scale as a measure of perceived attachment security in adolescence. To date, virtually no research has examined stability and change in attachment representations across the transition from childhood to adolescence, and it is likely that measurement difficulties were a significant limiting factor. Our results suggest that the Security Scale can be used in future

research to advance this area of inquiry and contribute to a deeper understanding of development.

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Table 1

Means, standard deviations, and intercorrelations

	2	3	4	5	6	7	8	9	10	11	12	13	14	M	SD
1. IPPA	.60**	.10	.11	-.06	-.07	-.20**	-.21**	.07	-.14	.12	.28**	-.24**	.25**	3.73	.70
2. Security Scale	-	.32**	.41**	-.09	-.15*	-.33**	-.39**	.09	.14	.14*	.27**	-.29**	.23**	3.14	.51
3. AR (y)		-	.54**	.05	-.13	-.22**	-.11	.12	.07	.00	.08	-.09	.12	7.09	2.07
4. AR (m)			-	.00	-.13	-.17*	-.28**	-.07	-.06	.02	.09	-.13	.02	8.38	1.70
5. UA (y)				-	.57**	.52**	.21**	.05	.12	-.07	.15	-.10	.08	1.39	1.68
6. UA (m)					-	.30**	.36**	.00	.04	.00	.14	.05	.12	1.46	1.73
7. UR (y)						-	.31**	.00	-.03	-.06	-.03	.02	-.05	1.35	1.32
8. UR (m)							-	-.01	.18	.11	-.07	.02	-.03	.67	.85
9. Social comp (m)								-	.58**	.22**	.17**	.06	.27**	3.93	.69
10. Social comp (f)									-	.27**	.17*	.01	.17	3.79	.66
11. Social comp (t)										-	.16**	.04	.14	3.16	.95
12. AAS – Depend											-	.32**	.63	20.88	4.91
13. AAS – Anxiety												-	.27**	22.40	4.77
14. AAS – Close													-	22.42	4.27

Note. AR = Autonomous Relatedness. UA = Undermining Autonomy. UR = Undermining Relatedness. m = mother. f = father. y = youth. t = teacher.

* $p < .05$.

** $p < .01$.

Table 2

Model path coefficients (β)

Dependent Variables	Model 1		Model 2		
	IPPA	R ²	IPPA	Security Scale	ΔR^2 <i>diff test</i> $\chi^2(1)$
Autonomous Relatedness (youth)	.10	.01	-.07	.37***	.10 10.79**
Autonomous Relatedness (mother)	.12	.01	-.11	.47***	.16 18.66***
Undermining Autonomy (youth)	-.06	.00	-.03	-.08	.00 -
Undermining Autonomy (mother)	-.05	.00	.02	-.14	.01 -
Undermining Relatedness (youth)	-.21**	.05	-.06	-.31***	.08 4.56**
Undermining Relatedness (mother)	-.22**	.05	-.03	-.39***	.12 8.76**
Social Competence (age 14)	.07	.01	-.10	.25*	.03 4.44*
AAS - Depend (age 17)	.28***	.08	.18**	.16*	.01 .07
AAS - Anxiety (age 17)	-.24***	.06	-.12††	-.21**	.03 1.22
AAS - Close (age 17)	.25***	.06	.17*	.13†	.01 .00

Note. Factor loadings for mother-, father-, and teacher-report social competence were .67, .84, and .33 (Model 1) and .57, .86, and .33 (Model 2), respectively. The chi-square difference test represents the difference in model fit when the paths from the IPPA and the Security Scale to the given outcome are constrained to be equal as compared to when they are estimated freely; a significant chi-square value indicates that the regression coefficients are significantly different.

†† $p < .07$.

† $p < .06$.

* $p < .05$.

** $p < .01$.

*** $p < .001$.