

Is Relational Aggression Part of the Externalizing Spectrum? A Bifactor Model of Youth Antisocial Behavior

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The primary purpose of the present study was to examine support for the inclusion of relational aggression (RAgg) alongside physical aggression (Agg) and rule-breaking behaviors (RB) as a subfactor of antisocial behavior (ASB). Caregiver reports were collected for 1,087 youth (48.9% male) ages 6–18. Results indicated that all three subfactors of ASB demonstrated substantial loadings on a general ASB factor. Using a bifactor model approach, specific factors representing each ASB subfactor were simultaneously modeled, allowing for examination of common and specific correlates. At the scale level, results demonstrated consistently strong connections with high Neuroticism and low Agreeableness across all 3 ASB subfactors, a pattern which was replicated for the general ASB factor in the bifactor approach. Specific factors in the bifactor model demonstrated connections with personality and psychopathology correlates, primarily for Agg. These findings provide some support for an overall grouping of RAgg with other ASB subfactors in youth, and further distinguish Agg as potentially representing a more potent variant of youth ASB relative to both RB and RAgg. *Aggr. Behav.* 39:149–159, 2013. © 2013 Wiley Periodicals, Inc.

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INTRODUCTION

Externalizing problems in children and adolescents typically encompass acting-out behaviors including bullying, vandalism, and theft (Achenbach, 2001; Tackett, 2006). Externalizing problems in younger age groups have long been recognized as a major subset of psychopathology, but research in this area has been impeded by documented heterogeneity among these behaviors (Burt, Donnellan, Iacono, & McGue, 2011; Burt, Donnellan, & Tackett, 2012; Tackett, Krueger, Iacono, & McGue, 2005). Various approaches to parsing heterogeneity in the externalizing domain have been proposed, but one of the longest-standing differentiations is rooted in the distinction made in Achenbach's family of instruments between (physical) aggressive (Agg) and rule-breaking (RB) behaviors (Achenbach, 2001). Although not currently embodied in the Diagnostic and Statistical Manual of Mental Disorders, researchers have established that Agg and RB behaviors show distinct developmental trajectories and etiologic factors, despite their moderate-to-strong intercorrelation (e.g., Burt, in press; Burt et al., 2012; Tackett et al., 2005). Importantly, these behavioral

dimensions (Agg and RB) are typically conceptualized as related but distinct subfactors that are subsumed under the broader externalizing domain (Burt, 2012).

Another type of acting-out behavior that has gained more research attention in the last several decades is relational, social, or indirect aggression. Although researchers sometimes use different terminology to reference these behaviors, these constructs are typically defined as aggressive behavior intended to damage one's social status or interpersonal relationships (Archer & Coyne, 2005). Relational aggression (RAgg), as we

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refer to these behaviors in the present study, has not been comprehensively incorporated into the study of youth externalizing problems (Underwood, Beron, & Rosen, 2011). RAgg, like RB, typically shows a moderate to strong correlation with Agg and has been found to demonstrate both overlapping and distinct correlates with Agg (Card, Stucky, Sawalani, & Little, 2008). Recent research has suggested that the etiology of RAgg may demonstrate a similar pattern to the etiology of RB, particularly regarding the influence of substantial shared environmental effects (Tackett, Waldman, & Lahey, 2009). Recent research has supported this claim with findings that RAgg is more likely to show peer influence than Agg (Dijkstra, Berger, & Lindenberg, 2011) and also may be learned based on experiences being victimized by relationally aggressive behaviors (Ostrov & Godleski, 2012). At the same time, research has supported general causal factors acting on RAgg and other forms of aggression (Coyne, Archer, & Eslea, 2004).

Similar to other types of externalizing problems, RAgg is associated with a host of negative outcomes, including psychopathology and peer rejection (Card et al., 2008; Underwood et al., 2011). Nonetheless, some research has questioned whether RAgg is appropriately classified alongside more typical forms of externalizing behavior (Keenan, Coyne, & Lahey, 2008; Burt et al., 2012), highlighting the need for additional research investigating the nature of RAgg alongside Agg and RB. Research highlighting adaptive aspects of RAgg have added to uncertainty around whether RAgg should be considered psychopathological, although evidence suggests that other types of ASB may share predictive variance for adaptive features of social and interpersonal functioning as well (e.g., Banny, Heilbron, Ames, & Prinstein, 2011; Shoulberg, Sijtsema, & Murray-Close, 2011). The goal of the current investigation was to directly test the hypothesis that a RAgg dimension is best classified as an additional subfactor within the broader externalizing domain.

THE BIFACTOR MODEL

The bifactor model has emerged as a sophisticated and parsimonious statistical approach for evaluating hierarchical models among related constructs (Chen, Hayes, Carver, Laurenceau, & Zhang, 2012). The concept of hierarchy has been fundamental to broad conceptualizations of child individual differences in both personality (Tackett et al., 2012) and psychopathology (Achenbach, 2001; Lahey et al., 2004), but advancements in this area have often been limited by statistical approaches available to test proposed hierarchical models (Markon, 2009). The bifactor model offers one potential solution. Drawing on models initially applied to intelligence and cognition,

the bifactor model estimates a general factor, representing the highest level of a given hierarchical structure and on which all related constructs load, as well as specific factors, representing the lower level of a hierarchical structure and on which only constructs defining that domain load (see Fig. 1 for a bifactor model of youth ASB). The primary utility of hierarchical models, substantiated by a bifactor model approach, is the ability to tease apart both general and specific factors influencing a group of related behaviors. In this way, more refined examination of causes, correlates, course, and outcome may be realized.

The bifactor model has not been widely used in studies of psychopathology structure, but some empirical examples of the utility of this model have been previously demonstrated. Specifically, the bifactor model approach has been applied to research on externalizing problems, including psychopathy (Patrick, Hicks, Nichol, & Krueger, 2007), attention deficit-hyperactivity disorder (ADHD; Martel, Gremillion, Roberts, von Eye, & Nigg, 2010; Martel, Roberts, Gremillion, von Eye, & Nigg, 2011), and general externalizing problems in adults (Krueger, Markon, Patrick, Benning, & Kramer, 2007). This research has resolved confusion around divergent correlates of psychopathy (Patrick et al., 2007), clarified distinctions among subfactors of youth ADHD (Martel et al., 2011), and aided understanding of comorbidity between ADHD and oppositional defiant disorder in youth (Martel et al., 2010). Most relevant to the current study, an investigation in adults found RAgg to load highly on a general externalizing factor, supporting its inclusion in the broader externalizing spectrum (Krueger et al., 2007). To date, this statistical approach has not been applied to theoretical conceptualizations of youth ASB, which is the aim of the present study.

PERSONALITY INFORMS HIERARCHICAL RELATIONSHIPS

Personality approaches are being utilized as an important psychological context to better understand the development, course, and phenotypic manifestation of psychopathology in childhood and adolescence (Tackett, 2006). For example, personality traits may shed light on structural models of psychopathology by illustrating the role of common and unique sources of variance among disorders or behaviors. One well-known example of this approach is the tripartite model, which characterizes both common (e.g., trait Neuroticism) and unique (e.g., trait Extraversion as a predictor of depression) sources of variance among internalizing problems such as depression and anxiety (Clark & Watson, 1991). A similar model for the externalizing domain that characterizes common behavioral subfactors (i.e., Agg, RB, and

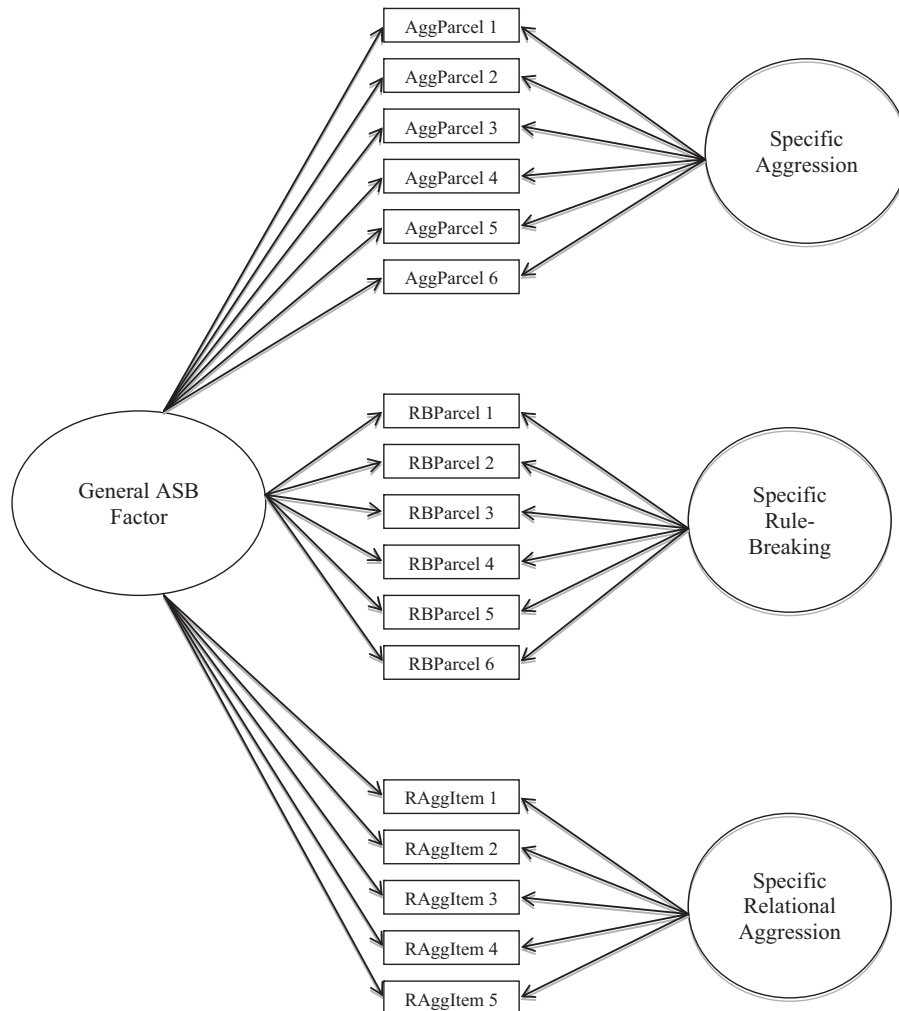


Fig. 1. Bifactor model of youth antisocial behavior (ASB). AggParcel #, CBCL Aggressive Behavior parcels; RBParcel #, CBCL Rule-Breaking Behavior parcels; RAggItem #, CSBS Relational Aggression items.

Ragg) has not yet emerged, despite the rich psychological context offered by examination of broadly defined, normative personality traits.

Furthermore, no investigations to date have examined the personality correlates of distinct subfactors of externalizing problems in children and adolescents. Some adult research has begun to address this question, however, and supports a hierarchical organization with both common and unique personality correlates for these behavioral subfactors (Burt & Donnellan, 2008; Burt et al., 2012). Specifically, research with adults has supported distinct personality correlates for Agg (high emotionality) and RB (high impulsivity; Burt & Donnellan, 2008). In addition, personality correlates have frequently been used to investigate validity of the bifactor model for other disorder domains (Martel et al., 2011; Patrick et al., 2007). Thus, we investigate personality correlates of general and specific factors of

youth ASB in order to better understand the nature of the ASB hierarchy in children and adolescents.

THE PRESENT STUDY

The present study addressed the following research questions:

1. *What is the hierarchical nature of youth ASB? Is RAgg a distinct construct from other ASB subfactors?* We hypothesized that RAgg is best modeled as an additional subfactor of youth antisocial behavior, alongside Agg and RB, despite its omission from many current approaches to conceptualizing youth ASB.
2. *Do additional correlates help resolve distinctions between ASB subfactors?* We examined both general and specific associations with normal-range personality traits and other areas of problem behavior (i.e., internalizing and social problems) to better understand

the nature of both general and specific factors of youth ASB. We also examined potential differences for these correlates across age and gender.

METHOD

Participants

Participants represent a combined sample from two studies conducted at the University of Toronto. For both studies, community participants were recruited from an urban area in Ontario, Canada via a database of families interested in research participation and through advertisements posted in the community. In the second study, additional participants were recruited through undergraduate students who collected data from one individual for a course assignment. In the first study, caregivers with children ($N = 345$) aged 9–10 ($M = 9.97$, $SD = 0.83$) were recruited. For the second study, caregivers with children ($N = 735$) aged 6–18 ($M = 11.25$, $SD = 3.65$) were recruited. The combined sample consisted of caregiver reports for 1,080 youth aged 6–18 years ($M = 10.85$, $SD = 3.10$) from 995 families (a small number of siblings were included in the sample). Target children in the combined sample were 48.8% male ($n = 527$). In all cases, information from the mother was used if present ($n = 904$) and information from the father was used for the remaining cases ($n = 176$). For the combined sample, 47% of the sample self-identified as of European descent, 12% Asian, 11% other, 2% African American, 1% Latino and 26% did not specify.

Measures and Procedure

Personality assessment. The Inventory of Child Individual Differences (ICID; Halverson et al., 2003; Deal, Halverson, Martin, Victor & Baker, 2007) was completed by caregivers. Caregivers in Study 1 completed the 144-item long-form of the ICID, whereas caregivers in Study 2 completed the 50-item short-form of the ICID. The 50 items used in the short-form ICID were pulled from the long-form ICID and used to create equivalent short-form scales across samples. Caregivers rated how well each item described their child on a scale from 1 (*much less than the average child or not at all*) to 7 (*much more than in the average child*). The ICID measures the higher-order dimensions of Neuroticism (N), Conscientiousness (C), Extraversion (E), Agreeableness (A), and Openness (O). In this sample, alphas for the traits ranged from .86 (E in Sample 2) to .95 (A in Sample 1), with an average of .91. Table I presents descriptive statistics for personality traits across studies and gender, as well as correlations with age.

Antisocial behavior assessments. Agg and RB behavior scores were collected via the Child Behavior Checklist (CBCL: 6–18; Achenbach, 2001), completed by

caregivers. The CBCL includes 118 items rated on a scale from 0 (*not true*) to 2 (*very true or often true*) over the past 6 months. The current study utilized the two scales that measure Aggressive Behavior and Rule-Breaking Behavior. Exemplar items from the Aggressive Behavior scale ask about cruelty, fighting and attacking, whereas exemplar items from the Rule-Breaking Behavior scale ask about lying, running away, and stealing. Relational aggression scores were collected via the Children's Social Behavior Scale (CSBS; Crick, 1996), also completed by caregivers. The CSBS includes 13 items rated on a scale from 1 (*never true*) to 5 (*almost always true*). Five of these items form the relational aggression (RAgg) subscale (excluding kids from his/her clique when mad, spreading rumors or gossip, influencing others to stop associating with certain children when mad at them, threatening to withhold friendship to hurt or manipulate another child, and ignoring another child when mad at them). Alphas for the behavioral scales in the combined sample were: CBCL Agg $\alpha = .87$, CBCL RB $\alpha = .73$, and CSBS RAgg $\alpha = .75$.

Internalizing and Social Problems assessments. Internalizing Behaviors and Social Problems scales were also collected via the Child Behavior Checklist (CBCL: 6–18; Achenbach, 2001), completed by caregivers. Exemplar items from the Internalizing Behaviors scale ask about anxiety, fear, and depression, and exemplar items from the Social Problems scale ask about isolation, clumsiness, and social interactions. Alphas for these scales in the combined sample were: CBCL Internalizing Behaviors $\alpha = .85$, and CBCL Social Problems $\alpha = .75$.

Procedure. Caregivers completed all questionnaires at home and either returned questionnaires during a lab visit (Study 1), by mail (Study 2) or via the student collecting data from the individual (Study 2). Caregivers participated in larger data collection efforts for which they were compensated monetarily (Study 1), with a gift card (Study 2) or partial course credit for the student data collector (Study 2). Ethical approval for both studies was acquired from the research ethics board and informed consent was collected from all participants. In Study 1, the CBCL and CSBS were added to data collection after the study start date, whereas the ICID was collected from initiation. In Study 2, a planned missing data design was utilized (Graham, Hofer & MacKinnon, 1996), such that the CBCL was administered to all participants, whereas administration of the ICID and CSBS were randomized. Thus, missing data were considered missing completely at random.

Data analysis. The Mplus package (Version 6.12; Muthén & Muthén, 1998–2011) was used to estimate confirmatory factor models presented here. Based on the planned missing data design, missing values were

TABLE I. Descriptive Statistics and Pearson r Correlation values with Age for the ICID-S Personality Traits and Subfactors of Antisocial Behavior for the Total Sample, Studies 1 and 2, and Males and Females

| Construct | Mean (<i>SD</i>) | Skew | Kurtosis | Correlation with age |
|------------------------------|--------------------|-------|----------|----------------------|
| Total sample ($N = 1,080$) | | | | |
| N | 3.28 (0.77) | 0.005 | 0.28 | .01 |
| E | 4.95 (0.56) | -0.07 | 0.18 | -.08** |
| O | 5.16 (0.75) | -0.20 | 0.21 | -.02 |
| A | 4.94 (0.85) | -0.36 | 0.30 | -.03 |
| C | 4.49 (0.89) | -0.18 | 0.44 | .05 |
| Agg | 3.78 (4.26) | 1.78 | 4.19 | -.01 |
| RB | 1.69 (2.28) | 2.75 | 11.15 | .14*** |
| RAgg | 8.48 (2.54) | 0.89 | 1.36 | .08** |
| Study 1 ($n = 345$) | | | | |
| N | 3.36 (0.77) | -0.22 | -0.27 | -.06 |
| E | 5.02 (0.62) | -0.21 | -0.24 | -.02 |
| O | 5.19 (0.83) | -0.17 | -0.23 | .04 |
| A | 4.91 (0.89) | -0.30 | 0.10 | .10 |
| C | 4.36 (1.01) | -0.05 | -0.24 | -.01 |
| Agg | 4.02 (4.19) | 1.55 | 3.12 | -.08 |
| RB | 1.63 (1.91) | 2.51 | 12.15 | -.05 |
| RAgg | 8.16 (2.85) | 1.07 | 1.61 | -.04 |
| Study 2 ($n = 735$) | | | | |
| N | 3.25 (0.77) | 0.11 | 0.61 | .04 |
| E | 4.92 (0.53) | -0.03 | 0.49 | -.09* |
| O | 5.15 (0.71) | -0.23 | 0.47 | -.02 |
| A | 4.96 (0.83) | -0.39 | 0.42 | -.06 |
| C | 4.56 (0.82) | -0.17 | 0.92 | .04 |
| Agg | 3.66 (4.29) | 1.89 | 4.74 | .01 |
| RB | 1.71 (2.44) | 2.74 | 10.27 | .17*** |
| RAgg | 8.62 (2.37) | 0.83 | 1.16 | .09* |
| Males ($n = 527$) | | | | |
| N | 3.31 (0.76) | 0.04 | 0.19 | .03 |
| E | 4.91 (0.57) | -0.03 | -0.05 | -.14** |
| O | 5.12 (0.75) | -0.18 | -0.08 | -.01 |
| A | 4.89 (0.86) | -0.38 | 0.40 | -.06 |
| C | 4.37 (0.86) | -0.15 | 0.58 | .02 |
| Agg | 3.84 (4.28) | 1.92 | 5.29 | .003 |
| RB | 1.87 (2.33) | 2.35 | 8.18 | .14** |
| RAgg | 8.35 (2.39) | 0.54 | 0.17 | .08 |
| Females ($n = 553$) | | | | |
| N | 3.26 (0.78) | -0.02 | 0.35 | -.01 |
| E | 4.99 (0.55) | -0.09 | 0.46 | -.04 |
| O | 5.20 (0.75) | -0.22 | 0.51 | -.03 |
| A | 4.99 (0.83) | -0.33 | 0.19 | -.01 |
| C | 4.61 (0.91) | -0.25 | 0.43 | .06 |
| Agg | 3.72 (4.24) | 1.64 | 3.14 | -.02 |
| RB | 1.51 (2.22) | 3.22 | 15.10 | .15*** |
| RAgg | 8.60 (2.68) | 1.10 | 1.88 | .08* |

Note. ICID-S, Inventory of Child Individual Differences-Short Form; N, Neuroticism; E, Extraversion; O, openness to experience; A, agreeableness; C, conscientiousness; Agg, physical aggression; RB, rule-breaking behavior; RAgg, relational aggression.

* $P < .05$.

** $P < .01$.

*** $P < .001$.

estimated using the expectation-maximization method in SPSS 17 in order to maintain a standard approach to the missing data for analyses conducted in SPSS and in Mplus. Non-independence of data for youth from the same family was handled using the CLUSTER feature in Mplus. The MLR estimator was used for model-fitting, which is

robust to non-normality of the data. Goodness of fit was evaluated with the root mean square error of approximation (RMSEA), comparative fit index (CFI), and square root mean residual (SRMR) statistics. Lower values of RMSEA ($<.08$) and SRMR ($<.08$), and higher values of CFI ($>.90$) indicate a better fitting model (Chen

et al., 2012). Items were residualized on age and gender prior to use in the model-fitting analyses. Also following the approach taken by Chen et al. (2012), and to make the overall model more tractable, parcels were created for the Agg and RB scales by summing 2–3 items, resulting in 6 parcels for each dimension. As the RAgg scale is substantially shorter, there were too few items (5 in total) to model parcels for this scale, so RAgg items were modeled directly.

RESULTS

A full bifactor model was fit to the data, with items and parcels associated with all three subfactors loading on a general ASB factor as well as one of three specific factors (see Fig. 1), which fit the data well (RMSEA = .04, CFI = .94, SRMR = .04, AIC = 28385.32, BIC = 28724.28). Factor loadings for the full bifactor model are presented in Table II. A second-order factor model has been proposed as a primary alternative hypothesized model against which to test the fit of a bifactor model (Chen et al., 2012; Martel et al., 2010). This model also fit the data reasonably well, although demonstrated slightly poorer fit across all indices (RMSEA = .05, CFI = .91, SRMR = .05, AIC = 28668.79, BIC = 28937.97). To test the hypothesis that RAgg should not be categorized alongside Agg and RB, a variant of the bifactor model was fit that did not allow RAgg to load on the general

ASB factor. In other words, all three specific factors were modeled, but the general factor was defined only by Agg and RB parcels with no loadings from RAgg items. This model fit noticeably worse than the full bifactor model (RMSEA = .05, CFI = .90, SRMR = .13, AIC = 28614.62, BIC = 28928.66), which was also supported by a significant Satorra–Bentler chi-square difference test ($\chi = 78.10$, $df = 5$, $P < .01$; Satorra, 2000).

Indices of association (as calculated in Mplus using the MLR estimator) revealed that the correlations among all ASB subfactors were significant: between Agg and RB ($r = .68$, $P = .000$), between Agg and RAgg ($r = .40$, $P = .000$) and between RB and RAgg ($r = .38$, $P = .000$). To examine relative differences across subfactor correlations, parameters were constrained to be equal and the Wald test of parameter constraints was examined to determine significance. In all cases, the Wald chi-square test was significant ($P < .01$), suggesting that none of the associations among ASB subfactors could be constrained to be equal. To examine potential differences between subsamples from Study 1 and Study 2, all ASB subfactor correlations were estimated separately for Study 1 and Study 2. Fisher's z scores were estimated to compare correlation magnitudes, revealing no significant differences in ASB interrelations between Study 1 and Study 2 samples.

Examination of Pearson correlations between the three ASB subfactors and the five personality factors from the ICID show identical overall patterns of association between personality and all ASB subfactors, although the magnitude of these associations differs by subtype (see Table III). Specifically, all subfactors showed a pattern of high Neuroticism and low scores on all remaining traits—most notably, low Agreeableness. These standard Pearson correlations were investigated first in order to examine whether the overall variance in RAgg appeared to map on to personality traits in a manner similar to Agg and RB, which was supported by these results. To further

TABLE II. Standardized Factor Loadings From the Bifactor Model of Youth ASB

| Item/Parcel | General and specific factors | | | |
|-------------|------------------------------|------------|------------|------------|
| | General | Agg | RB | RAgg |
| AggP1 | .69 | .30 | | |
| AggP2 | .74 | .09 | | |
| AggP3 | .74 | –.03 | | |
| AggP4 | .63 | .54 | | |
| AggP5 | .58 | .34 | | |
| AggP6 | .71 | .32 | | |
| RBP1 | .72 | | .14 | |
| RBP2 | .63 | | .15 | |
| RBP3 | .32 | | .22 | |
| RBP4 | .63 | | .32 | |
| RBP5 | .36 | | .52 | |
| RBP6 | .27 | | .60 | |
| RAgg1 | .39 | | | .67 |
| RAgg2 | .37 | | | .49 |
| RAgg3 | .34 | | | .62 |
| RAgg4 | .36 | | | .50 |
| RAgg5 | .28 | | | .46 |

Note. AggP#, parcel from the CBCL Aggressive Behavior items; RBP#, parcel from the CBCL Rule-Breaking Behavior items; RAgg#, CSBS Relational Aggression item; all bolded parameters were significant at $P < .01$.

TABLE III. Pearson Correlations Between Standardized Scores of Antisocial Behavior Subfactors and Higher-Order Personality Traits

| Personality | Subfactors of antisocial behavior | | |
|-------------|-----------------------------------|------------|------------|
| | Agg | RAgg | RB |
| N | .62 | .33 | .42 |
| E | –.07 | –.10 | –.08 |
| O | –.16 | –.18 | –.19 |
| A | –.65 | –.32 | –.46 |
| C | –.37 | –.18 | –.33 |

Note. All correlations significant at $P \leq .001$ are presented in bold text. N, Neuroticism; E, Extraversion; O, Openness; A, Agreeableness; C, Conscientiousness; Agg, Aggressive Behavior; RAgg, Relational Aggression; RB, Rule-Breaking Behavior. $N = 1,087$.

investigate both common and unique associations among ASB subfactors, variables representing personality traits and other problem behaviors were also added to the full bifactor model in Mplus, using the MLR estimator to handle non-normality. These indices of association are presented in Table IV. Personality associations with the general ASB factor in the overall model revealed a similar pattern of association marked by high Neuroticism, low Agreeableness, low Conscientiousness, and low Openness to Experience. The common factor was also moderately correlated with Internalizing Behaviors and Social Problems. The general ASB factor appeared to account for most of the shared variance between the three ASB subfactors and personality traits, with few remaining connections for the specific ASB subfactor variance. Agg showed incremental connections with high Neuroticism, low Agreeableness, high Internalizing Behaviors, and Social Problems whereas RB showed a small incremental connection with low Neuroticism. Specific variance in RAgg did not show any incremental connections with personality traits, Internalizing Behaviors, or Social Problems.

Given the complexity of the bifactor model, the sample was underpowered to investigate the influence of age and gender in full multi-group models. To examine evidence for potential gender differences, the model was fit separately by gender and fit well in both girls (RMSEA = .05, CFI = .95, SRMR = .05) and boys (RMSEA = .05, CFI = .95, SRMR = .05). Next, evidence for gender differences was investigated in the relations among factors in the full bifactor model with personality traits and additional behavioral problems (i.e., those associations presented in Table IV). Specifically, a series of nested models were fitted allowing gender differences in these associations and were then compared to models constraining parameters across gender. Comparisons were conducted with the Satorra–Bentler chi-square test with appropriate scaling corrections made for use of the MLR estimator (Satorra, 2000). In all cases, the chi-square difference test failed to reach

significance (at $P < .05$), suggesting that associations between all factors in the bifactor model with personality traits and behavioral problems did not significantly differ between boys and girls in the sample.

Given the relevance of age for subfactors of ASB, regression analyses were performed in SPSS to examine potential age moderation of personality predictors for the unique variance in each ASB subfactor (after controlling for the remaining two subfactors). All variables were centered to create interaction terms for age and each of the FFM traits. Control variables included gender, age, and the remaining two ASB subfactors, which were followed by main effects for all five personality traits, and finally interaction terms for all traits by age. Only one relationship showed evidence of moderation by age: the prediction of RB by Agreeableness ($A \times \text{age } B = -.16$, 95% CI $[-.24, -.08]$). To probe this interaction further, the sample was divided into four subgroups by age: ages 6–8 ($n = 261$), ages 9–11 ($n = 462$), ages 12–14 ($n = 168$), and ages 15–18 ($n = 196$). The regression analysis was run in each of the four age groups to investigate the relationship between Agreeableness and RB. Agreeableness was not a significant predictor of RB in the 6–8 group ($B = -.04$, 95% CI $[-.18, .09]$), the 9–11 group ($B = .07$, 95% CI $[-.04, .17]$), or the 12–14 group ($B = -.08$, 95% CI $[-.32, .16]$). However, Agreeableness was a marginally significant ($P = .06$) unique predictor of RB, after accounting for gender, Agg, and RAgg, in the 15- to 18-year-old age group ($B = -.24$, 95% CI $[-.50, .01]$).

DISCUSSION

These results support a hierarchical model of youth externalizing which groups Agg, RB, and RAgg into a common domain of psychopathology with each representing a distinct subfactor of externalizing behavior. Specifically, an overall bifactor model with specific factors for Agg, RB, and RAgg, fit the data well and items/parcels for the subfactors all showed substantial loadings on the general ASB factor. Taken together, these

TABLE IV. Relations of the General and Specific ASB Subfactors to Personality and Problem Behaviors

| | General | Agg | RB | RAgg |
|-------------------------|---------------------|---------------------|--------------------|------------------|
| Neuroticism | .56** [.49, .62] | .36** [.25, .47] | -.07* [-.14, -.00] | .02 [-.05, .08] |
| Extraversion | -.05 [-.12, .03] | -.10 [-.21, -.01] | -.01 [-.11, .09] | .00 [-.08, .08] |
| Openness | -.21** [-.30, -.11] | .01 [-.13, .14] | -.03 [-.18, .11] | -.06 [-.15, .02] |
| Agreeableness | -.60** [-.69, -.51] | -.35** [-.61, -.10] | .10 [-.08, .27] | .01 [-.06, .08] |
| Conscientiousness | -.43** [-.50, -.35] | -.03 [-.15, .10] | .03 [-.13, .18] | .02 [-.06, .11] |
| Internalizing Behaviors | .44** [.35, .54] | .54** [.42, .67] | .06 [-.07, .19] | .06 [-.01, .13] |
| Social Problems | .54** [.44, .64] | .35** [.17, .53] | -.06 [-.19, .08] | .05 [-.02, .12] |

Note. Standardized parameter estimates are presented with 95% confidence intervals in brackets.

* $P < .05$.

** $P < .01$.

results suggest that RAgg is inappropriately left out of the broader domain of youth ASB. Similarly, correlational patterns revealed convergent associations among personality traits and all three subfactors, with the strongest relationships between high Neuroticism and low Agreeableness across all types of ASB, consistent with work in adults (Burt et al., 2012).

An examination of additional correlates with general and specific ASB factors revealed strong associations for general youth ASB and specific Agg factors. On the other hand, the lack of overall associations with personality and psychopathology correlates indicate that much less variance in these correlates is captured by specific RB and RAgg factors, after accounting for shared ASB variance across all the subtypes. These findings are consistent with research pointing to shared etiologic factors between RAgg and other forms of ASB (e.g., Coyne et al., 2004). Specifically, general ASB was associated with high levels of Neuroticism, Internalizing Behaviors, and Social Problems, and low levels of Openness to Experience, Agreeableness, and Conscientiousness. Specific variance in Agg showed connections with high Neuroticism, Internalizing Behaviors, and Social Problems, and low Extraversion and Agreeableness. The extent to which connections with specific Agg replicated findings with general ASB suggest that unique variance in Agg may predict especially strong connections with other correlates, above and beyond that predicted by general ASB. Specific variance in RB showed a significant connection to low Neuroticism, in contrast with general ASB and specific AGG. Specific variance in RAgg did not show significant connections to the included correlates. Follow-up analyses examining potential moderation by age yielded very little evidence for moderation of personality-externalizing behavior relations among ASB subfactors. Agreeableness predicted the unique variance in RB only in the oldest age group (ages 15–18), suggesting that, after accounting for a general propensity toward ASB, less agreeable youth engage in increased RB in mid-late adolescence, but not at earlier ages.

These findings are consistent with research suggesting that Agg may represent a more severe subfactor of youth ASB (e.g., Burt, 2012; McEachern & Snyder, 2012; Moffitt, 2003). Specifically, although all three ASB subfactors evidence substantial loadings on an overall ASB factor, Agg showed the most unique connections to both the general ASB factor and the additional correlates, relative to RB and RAgg. That is, Agg parcels show the highest overall loading on general ASB (mean $r = .68$) compared to both RB parcels (mean $r = .49$) and RAgg items (mean $r = .35$). Yet, specific variance in Agg showed the strongest connections with correlates, suggesting that this dimension, in particular, captures

meaningful psychological variance above and beyond general ASB in terms of the specific correlates investigated in the present study. Based on previous recommendations (Chen et al., 2012) and to reduce item-level unreliability, we used parcels to reflect variance from Agg and RB items. Thus, it is difficult to interpret the differential contribution of specific Agg and RB content to the specific subfactor variance, although the factor loadings suggest that some items may be contributing more (or less) to the general ASB factor. Indeed, such associations may suggest that certain behaviors or items are a better representation of a general tendency to engage in ASB than they are characteristic of a particular form. This then highlights an important avenue for future research on types of common and non-overlapping variance and the potential for more streamlined measurement to focus on a subset of items best capturing general ASB variance and those targeting non-overlapping variance for each ASB subtype.

It is also important to note that, in general, the Agg and RB parcels showed higher loadings on the general factor than on the specific factors, relative to RAgg items. The difference in scales may partially account for this, such that the Agg and RB scales consist of many more items than the RAgg scale, which may have offered a more powerful measurement of these underlying constructs. In addition, the use of parcels for Agg and RB should decrease item-level unreliability and thus, increase robustness of the findings, whereas the same advantage is not present for RAgg and may have underestimated RAgg connections relative to Agg and RB. It is also possible, however, that additional unique variance in RAgg remains that is not well captured by the correlates examined in the present study (i.e., broad normal-range personality traits and problem behaviors) but is nonetheless psychologically meaningful. For example, recent empirical evidence suggests that RAgg is more closely tied to aspects of primary psychopathy (e.g., manipulativeness, remorselessness) than secondary psychopathy (e.g., reckless and impulsive ASB; Vaillancourt & Sunderani, 2011), pointing to potential future expansions of the correlates investigated in the current study.

These results can also be interpreted in the context of developmental and etiologic theories of youth ASB (e.g., Moffitt, 2003). To the extent that some types of ASB may be more normative in youth, the problematic aspects of these behaviors (e.g., RB and RAgg) may be well captured by a general ASB factor (or, that variance shared with other forms of youth ASB), leaving little remaining variance of psychological importance (a hypothesis which must be investigated in future studies employing a broad range of correlates). This is consistent with behavior genetic investigations of youth ASB, which have found stronger genetic influences on Agg (e.g.,

Burt, 2009; Tackett et al., 2005) with greater importance of shared environment for both RB (Burt, 2009; Tackett et al., 2005) and RAgg (Dijkstra et al., 2011; Tackett et al., 2009). This explanation receives further support for RB in that unique variance in RB was actually *negatively* correlated with Neuroticism, suggesting higher levels of emotional stability. Although the sample was underpowered to fully investigate nuanced distinctions across age, moderation analyses did find that lower Agreeableness was associated with RB, but only in the adolescent (ages 15–18) group. Furthermore, both the general factor and the specific Agg factor were highly correlated with Internalizing and Social Problems, but the specific RB and RAgg factors showed nonsignificant associations with these other problem behaviors. These findings converge on potential support for the normative hypothesis of certain types of youth ASB, and further indicate potential parallel processes for RB and RAgg in this regard, offering important new directions for future studies.

These findings suggest that personality can be a useful tool in investigations of psychopathology structure. Such analyses highlight the core psychological nature of related behaviors—in this case, high levels of Neuroticism and low levels of Agreeableness and Conscientiousness—while also informing us about the unique variance in specific factors. Specifically, personality correlates suggest that the core psychological nature of RAgg is very similar to that of Agg and RB—all share the same pattern of personality associations when examining scale-level correlations. Although these findings do not speak to the question of whether RAgg should be considered pathological (Keenan et al., 2008), they add to growing evidence supporting an inclusion of RAgg in studies of externalizing problems (Burt et al., 2012; Tackett et al., 2009). Further, in combination with findings in adults (Burt & Donnellan, 2008; Burt et al., 2012), these findings move us toward a hierarchical model of externalizing behavior that incorporates common and unique personality traits. Findings for unique associations give us a better sense of the distinct nature of the subfactors represented here. For example, unique variance in RB is related to lower Neuroticism, which has implications for the nature of RB behaviors that is distinct from standard externalizing trajectories. Particularly in a broader conceptualization of normative developmental processes, these findings begin to further our understanding of different aspects of youth ASB.

In terms of practical implications, these findings point toward a need for better understanding core underlying processes involved in externalizing problems across the spectrum, with a more critical eye toward potential specific factors that differentiate one phenotype from another. All three behavioral subfactors investigated

here reflect core underlying processes of high levels of negative affect (i.e., high N) with low levels of self-control (i.e., low A and C). Importantly, this profile defined RAgg behaviors just as it did Agg and RB behaviors. Although specific variance in RAgg was not captured in the correlates investigated here, common externalizing variance in RAgg was nonetheless quite consistent with an overarching externalizing phenotype. Thus, remaining questions of incremental validity for RAgg in a clinical context must be balanced with this early evidence that RAgg behaviors also represent a type of externalizing behavior marked by similar core underlying components as more standard forms of youth externalizing problems. Indeed, recent research on the consequences of RAgg presents a complicated picture. For example, one recent study found relationally aggressive talk in friendships to predict negative friendship quality 6 months later—however, it also predicted positive friendship quality 6 months later when the child endorsed a reciprocal best friendship (Banny et al., 2011). In addition, RAgg appears to share common features with Cluster B personality disorders, and these interpersonally maladaptive features (which can, at times, also serve adaptive functions) may be the key to establishing unique clinical relevance for RAgg behaviors (Underwood et al., 2011; Vaillancourt & Sunderani, 2011). In order to better tease apart the functioning of RAgg relative to other types of ASB, it is imperative for researchers and clinicians to incorporate simultaneous measures of RAgg, Agg, and RB in their assessments.

Limitations of this research include the use of a majority White community sample; these findings should be replicated in clinical samples and samples with increased diversity. Recent research has suggested that ASB subfactors may differentially relate to impairment and additional correlates across cultures (e.g., Kawabata, Tseng, Murray-Close, & Crick, 2012). In addition, as measurement of youth personality is still at earlier stages relative to work with adults (Tackett, 2006), these results should be compared with studies using different personality and temperament measures. Furthermore, the choice of informants has received substantial attention in the RAgg literature (e.g., Tackett et al., 2009) and remains an important topic of discussion for researchers and clinicians who must determine how and where to best obtain information about RAgg behaviors. In particular, it is possible that parents' ability to provide valid reports on their children's ASB decreases as the children age into late adolescence (as discussed in Burt, 2012). Moreover, this inability may be more pronounced for covert antisocial acts (like stealing and other property violations) than for overt antisocial acts (getting in fights), with are by definition, more difficult to

hide from others. Future research should thus seek to replicate these using a multi-informant approach. Importantly, these findings suggest that RAgg should be incorporated in future research on externalizing problems in children and youth, as current approaches omitting these behaviors may be missing an important aspect of the broader ASB dimension.

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