

Self-Reported Use of Different Forms of Aggression in Late Adolescence and Emerging Adulthood

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Two studies investigated the psychometric properties of a self-report measure of commonly recognized forms of aggression (FOA) that could be used to efficiently gather aggression data in large samples. EFA and CFA in Study 1 suggested that a five-factor model (Physical, Property, Verbal, Relational, and Passive/Rational) best represented the data across high school and college students. However, factor analyses in Study 2 using an ethnically diverse university sample revealed a four-factor solution (combining Physical and Property items). As a confirmation of the construct validity of FOA, physical and property aggression were lower, and verbal and passive-rational aggression were higher in college versus high school students. Gender differences were observed across FOA subscales, except relational aggression. FOA subscales correlated as expected with other anger and personality scales. Overall, the data revealed adequate psychometric properties for the FOA and suggest that current category distinctions (e.g., direct–indirect) may not adequately account for different forms of aggression. And researchers may want to reevaluate these categories.

Keywords: *physical aggression; verbal aggression; indirect aggression; relational aggression; gender*

To fully understand aggression, researchers need to identify and assess a broad assortment of behaviors people who are angry or frustrated use to inflict harm against others. Research suggests that aggression may manifest differently depending on the personality (Helfritz & Stanford, 2006), gender (Björkqvist, Österman, & Lagerspetz, 1994), and age (Björkqvist, Lagerspetz, & Kaukiainen, 1992) of the aggressor. Thus, attempting to measure aggression using a single form of aggressive behavior (e.g., physical aggression) may not capture a complete picture of important

individual differences in aggressive tendencies. Furthermore, research has shown that some forms of aggression (FOA) differentially predict maladaptive psychological and behavioral outcomes (Crick, 1997; Werner & Crick, 1999), which suggests that assessing multiple forms of aggressive behavior may be helpful for identifying at-risk individuals and developing effective treatment interventions.

Because most existing aggression measures only assess a limited number of FOA, this project seeks to validate a self-report measure that simultaneously assesses a broad range of FOA. Participants reported on their tendency to use different forms (e.g., physical, verbal) of aggression “when upset or angry,” a context in which aggression is likely to occur. Assessing aggression in response to anger allowed us to measure actual behaviors used in anger situations and not just the level of angry affect experienced in these situations (Spielberger & Sydeman, 1994). To determine

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the utility of the FOA questionnaire, we (a) used exploratory and confirmatory factor analysis (CFA) to investigate the factor structure of items selected to represent commonly recognized and validated FOA (Studies 1 and 2), (b) assessed how aggression may manifest differently in males and females and across two different settings: high school and college (Study 1), and (c) examined trait anger and personality correlates of the different FOA that emerged from our factor analyses in an attempt to empirically differentiate them (Study 2). The validation of this questionnaire would allow aggression researchers to further refine conceptualizations of the categories of aggressive behaviors that people use to hurt others.

Forms of Aggression

Aggressive behavior is generally characterized as an intentional act that is directed toward another individual with the goal of inflicting harm or injury (Anderson & Bushman, 2002). Given the broadness of this definition, it is not surprising that researchers have identified an assortment of aggressive behaviors that occur across different contexts and populations. To name a few, the extant literature includes research on physical, verbal, rational-appearing, social manipulation, relational, social, direct, indirect, overt, and covert FOA. Some of these FOA have been used to make broad distinctions between aggressive behaviors (i.e., overt vs. covert, direct vs. indirect; Buss, 1961) whereas others have been created to elucidate subtle differences between FOA (i.e., rational-appearing vs. verbal aggression). However, given the dearth of research that incorporates various types of aggressive behaviors in the same analysis, it is unclear whether these distinctions are empirically valid.

Studies of aggression often focus on physical FOA (e.g., Verona & Kilmer, 2007), which are defined by the use of physical force to inflict harm on others. Besides the typical physical acts used to inflict harm on others (e.g., hitting, kicking, and pushing), other behaviors, such as the destruction of property, have also been included under the category of physical aggression (e.g., items from Buss & Perry, 1992). In addition to physical aggression, words are often used to directly hurt others in the form of verbal aggression, including yelling at and threatening others. Verbal and physical or property FOA are often included in a broad category of “direct” aggression.

Another form of aggression that is commonly studied in the literature, especially in regards to female aggression, occurs within social networks or dyads.

Researchers use the terms *relational* (Crick, 1995), *social* (Galen & Underwood, 1997), and *indirect* (Lagerspetz, Björkqvist, & Peltonen, 1988) *aggression* to make subtle distinctions between different types of socially aggressive behaviors. For example, Crick (1995) defined relational aggression as “harming others through damage to their peer relationships” (p. 313), whereas Galen and Underwood (1997) described social aggression as “aggression directed toward damaging another’s self-esteem, social status, or both” (p. 589). Thus, Galen and Underwood used the term social aggression to describe behaviors that are broader than those implied by the term relational aggression (Crick et al., 1999). Some authors, including Lagerspetz et al. (1988), have used the term *indirect aggression* interchangeably with *social manipulation*, suggesting conceptual similarity to relational and social aggression. Though Björkqvist et al. (1994) have interpreted the definition of indirect aggression to apply only to instances of manipulation in which the aggressor remains unidentified to the victim, a variety of researchers have suggested that indirect aggression requires only a lack of direct confrontation or disguised intentions and does not necessarily imply anonymity (Buss, 1961; Buss & Perry, 1992; Crick et al., 1999; Feshbach, 1969). Thus, there is significant overlap in the way the terms relational, social, and indirect aggression are described in the literature. For the purpose of this article, we will refer to different FOA that involve manipulating relationships to harm others as relational aggression, because this term has been used widely following the work of Crick and colleagues (1999). One of the benefits of developing an instrument that captures various FOA is that distinctions and overlap across the many definitions used in the literature can begin to be refined.

Another form of aggression that has been identified among adults in the workplace is referred to as rational-appearing aggression (Björkqvist et al., 1994; Kaukiainen et al., 2001). Rational-appearing aggression reflects behavior that is intended to interfere with the target’s ability to succeed while appearing rationally motivated, such as “publicly questioning [his/her] sense of judgment” and “reducing [his/her] opportunities to express opinions” (Kaukiainen et al., 2001, p. 363). This form of aggression may not fit neatly into a direct versus indirect dimension. While it may be strongly related to verbal (and, thus, direct) aggression in that rational-appearing aggression involves “wrapping aggressive purposes into ‘normal’ communication” (p. 363), it has been characterized as “covert” (Björkqvist et al., 1994).

It also shares some characteristics with acts colloquially referred to as passive aggression that were identified by Buss (1961). Richardson, Ferguson, and Daniel (2006) defined passive aggression as involving strategies that prevent another person from achieving a goal via the absence of activity (e.g., taking their time doing something; ignoring the other person). Recent work (Richardson et al., 2006) has differentiated “passive aggression” from relational aggression, although the correlations between relational and passive aggression were high ($r_s = .60-.70$). Given previous research, it is unclear whether rational-appearing aggression, passive aggression, and relational aggression are overlapping or distinct constructs, especially because these behaviors have not been assessed simultaneously. The present study can help evaluate the validity of these distinctions.

In addition to different methods, another dimension of aggression is the severity of aggressive behavior. For example, physical aggression could range in severity from acts that are uncomfortable, but not painful (e.g., administering mild shocks in a laboratory context or pushing another individual) to acts that are extremely violent and result in life-threatening physical injury. Aggressive severity also encompasses the number of victims involved (e.g., hurting multiple people). In studies that recruit samples from the general population, aggressive severity is likely to be lower than that observed in violent offenders, for example. Severity is probably confounded by the form of aggression used; that is, physical aggression is probably more “severe” than passive aggression. Thus, another contribution of a comprehensive measure of aggression is its potential usefulness for studying aggression across samples that differ on the severity of aggression inflicted on an adversary.

Finally, the motives for aggression, reactive (or hostile) versus proactive (or instrumental), are often emphasized in the literature (Miller & Lynam, 2006; Poulin & Boivin, 2000), although Bushman and Anderson (2001) have questioned the ability to make these distinctions as most acts of aggression involve multiple motives (e.g., hurting the other person; obtaining power and control). The current study examined engagement in different types of aggressive behavior when individuals are angry or upset, due to the relevance of negative affect in the broader literature on aggression (Berkowitz, 1990). Because persons differ on the intensity and frequency of their negative emotions or in what contexts anger occurs, this format ensured that participants were responding on the frequency of their aggressive behaviors under the same eliciting situation (anger).

Conceptual Organizations of Aggression

Researchers commonly distinguish between different forms of aggressive behavior by categorizing aggressive acts as either directly confrontational or disguised/indirectly confrontational. This *direct–indirect* distinction represents the degree to which aggression involves a face-to-face confrontation and the aggressor is easily identifiable (Buss, 1961). For example, Richardson and Green (1999) labeled direct aggression as including physical, verbal, and some forms of property aggression (“smashed something”), and indirect aggression as mostly relational aggression. However, it is not always clear which FOA should fall into the direct and indirect categories. Relational aggression can involve indirect aggressive acts, such as spreading rumors, that allow the aggressor to maintain anonymity and avoid retribution, as well as directly aggressive acts, such as threatening to withdraw friendship, in which the aggressor confronts the target face-to-face. Likewise, property aggression can involve either smashing someone’s property in front of them or discreetly setting a fire, acts which differ as to whether the aggressor can be readily identified. Furthermore, going beyond the direct–indirect distinction may have important implications for identifying potential outcomes. For example, verbal and property aggression are both considered direct aggression, but verbal aggression may predict lack of adaptability in social groups whereas property aggression may predict risk for more severe delinquent outcomes (e.g., breaking and entering). In our view, a unified measure of aggressive behaviors can help researchers investigate these potentially different outcomes.

Despite the extensive theoretical work that has been done, very few empirical investigations of the relationships that exist between recognized FOA have been conducted to justify the broad categorizations commonly made in the literature. A few studies have examined the factor structure of two or three FOA at a time. For instance, factor analysis of the Aggression Questionnaire (AQ) has resulted in separate physical and verbal aggression subscales (Buss & Perry, 1992; Harris, 1995); the rest of the AQ scales assess emotions and attitudes (anger, hostility). Similarly, analysis of the Revised Peer Experiences Questionnaire (Prinstein, Boergers, & Vernberg, 2001) has yielded distinct overt and relational aggression subscales, whereas the Overt–Covert Aggression Scale (OCAS; Kaukiainen, Salmivalli, Lagerspetz, Lahtinen, & Kostamo, 1997) in adults has revealed four subscales: Direct Overt, Indirect Manipulative, Covert Insinuating

and Rational-Appearing Aggression. Thus, the extant literature suggests that at a minimum physical, verbal, and relational aggression can be empirically differentiated from other types of aggressive behaviors. However, a comprehensive empirical analysis of all of these FOA has yet to be conducted in a single study, leaving open the possibility that the combination of these types of aggression would yield different factor structures than previous studies have suggested, and perhaps reveal differential correlates for the separate FOA.

Current Objectives

Although well-established measures of aggression in the general population already exist, none represents a unified assessment instrument that incorporates a wide range of aggressive behaviors. This type of questionnaire would be convenient for researchers interested in an array of aggressive behaviors, because it would reduce the number of total items and, consequently, allow researchers to collect large amounts of data relatively quickly. The current project was an attempt to (a) examine the factor structure of a self-report instrument that can be used to assess a wide range of FOA in different samples drawn from the general population and (b) establish support for the instrument's construct validity and the discriminant and convergent validity of its subscales. Two studies were conducted to achieve these aims.

Study 1

The main goal of Study 1 was to validate self-report items of different forms of angry aggression in two settings in which conflict with peers may manifest differently: high school and college (Paquette & Underwood, 1999; Prinstein et al., 2001). The high school and college samples differ on age, but presuming that all high school students do not end up in college, there may be other characteristics that differ between these samples. The rationale behind including both samples was to validate the measure across different populations of participants that differ along various characteristics, including age, academic achievement, maturity, and verbal skills. We conducted exploratory factor analyses (EFAs) to initially extract factors. Then, the validity of the EFA results was examined using CFAs, in which we compared the fit of different factor structures, including those advocated in the literature (a direct vs. indirect aggression

model, Crick, Casas, & Mosher, 1997; Kaukiainen et al., 1997), across both high school and college students.

The second goal of Study 1 was to confirm gender and setting (high school and college) differences in the self-reported use of different FOA. It was predicted that boys would report engaging in more physical aggression than girls (Bettencourt & Miller, 1996), but the girls would endorse more relational aggression, though this gender difference does not necessarily emerge consistently during adolescence and emerging adulthood (Green, Richardson, & Lago, 1996; Paquette & Underwood, 1999). Last, we predicted that college students would engage in less physically aggressive behavior and more indirect FOA than the high school students (Achenbach, Howell, McConaughy, & Stanger, 1995), since the former behaviors are highly discouraged among students entering into adulthood and particularly among those in higher education. FOA that are reliant on sophisticated verbal skills and guile (e.g., relational, rational-appearing) may be more likely to be used by college students than high school students.

Study 1 Method

Participants

Male and female university students ($N = 744$; 421 females) were tested at Kent State University (KSU; $n = 361$), University of Pennsylvania (Penn; $n = 124$), and University of Illinois (UI; $n = 259$). These participants (university sample) were recruited from introductory psychology and marketing classes and participated for class credit. Institutional Review Board (IRB) approval was obtained from each university, and each participant signed an informed consent form. The majority of the participants ($n = 516$; 78%) were between 18 and 20 years old (M age = 20, $SD = 3.9$). The ethnic distribution was 76% Caucasian ($n = 561$), 7% African American ($n = 51$), 8% Asian descent ($n = 60$), 4% Hispanic ($n = 31$), and the rest identified as Native American, "biracial," or "other ethnicity" ($n = 32$).

A large sample of high school students ($N = 823$; 434 girls) were tested at a public, suburban high school in Norristown, Pennsylvania, near Philadelphia (high school sample). Though ethnicity data could not be collected directly from the participants, the ethnic profile of the high school's total enrollment of 1,592 was as follows: 1,441 (90.5%) Caucasian students, 59 (3.7%) African American

students, 79 (5.0%) students of Asian descent, and 13 (0.8%) Hispanic students. The students were recruited from the entire high school, with the exception of special education classes, and the forms were completed in an extended (45-min) homeroom period. Informed consent was obtained for all participants from a parent, and the participants provided assent to participate. Less than 1% of parents at the school refused to have their children participate. Participants' responses were kept confidential in that their data were only identified through identification numbers. Most of the students (89%) were between the ages of 14 and 17 (M age = 16, SD = 1.3). There was proportional representation of each grade level (9-12) in this sample (27% freshmen, 25% sophomore, 23% junior, and 17% senior).

Data across university and high school students were combined and divided into two random samples: Random Sample 1 (RS1), N = 812 (371 university, 441 high school students) and Random Sample 2 (RS2), N = 755 (373 university, 382 high school students). RS1 data were used for EFA, and data from RS2 were used in validating the factor structure using CFAs. The gender distribution was similar across RS1 and RS2 (56% and 53% female, respectively).

FOA Item Selection and Administration

All high school and university students responded to a set of 66 items that asked what they did "when upset or angry with other people." The latter statement was modeled after Spielberger's Anger Expression Scale (Spielberger & Sydeman, 1994), and it was incorporated to more directly assess the actual use of different FOA rather than just a general level of subjective anger. Also, without this qualifier, individuals may underreport that they use these behaviors, unless they are placed in a context which more likely calls for aggression. Participants responded to the items using a Likert-type scale ranging from 1 (*Almost Never*) to 5 (*Always*). Items were selected and written at about the sixth-grade level (verified by Flesch-Kincaid Grade Level index). All items, regardless of category (or form of aggression), were mixed together and pseudo-randomly placed across the questionnaire (e.g., items with similar content were not placed consecutively).

Item selection involved sampling from recognized and validated categories of aggression. To select the items, we reviewed research papers and several existing and widely used aggression or anger questionnaires,

including the OCAS (Kaukiainen et al., 2001), Work Harassment Scale (Björkqvist, Österman, & Hjelt-Bäck, 1992), the Conflict Tactics Scale (Straus, 1979), the Anger Expression Scale (Spielberger & Sydeman, 1994), the AQ (Buss & Perry, 1992), the Richardson Conflict Response Questionnaire (Richardson & Green, 2003), and Crick and Grotpeter's (1995) and Lagerspetz et al.'s (1988) peer nomination measures. To include items that differed on the severity of physical and property aggression, we also borrowed from the Externalizing Questionnaire (Krueger, Markon, Patrick, Benning, & Kramer, 2007), which is one of the few instruments containing more severe items (e.g., "hit them in the face or head," "beat them up," "vandalize their house," "start a fire"). Items were modified or newly written to fit into the following six FOA that were reliably identified in the literature:

1. *Physical aggression* (10 items) assessed attempts to directly hurt the target physically (e.g., "beat up").
2. *Property aggression* (9 items) items asked about destructive behaviors directed at the target's property or things (e.g., "vandalize their house").
3. *Verbal aggression* (12 items) items asked about face-to-face encounters in which the participant was verbally assaultive by insulting, criticizing, or intimidating likely targets (e.g., "say mean things").
4. *Relational aggression* (13 items) included items that assessed attempts to harm others through their relationships or social networks (e.g., "ruin their friendships"; Crick & Grotpeter, 1995).
5. *Passive aggression* (7 items) items included attempts to hurt others by withdrawing, withholding help or communication, and/or frustrating others through inaction (e.g., "refuse to listen to them"; Richardson et al., 2006).
6. *Rational appearing aggression* (9 items) refers to acts, mostly used by adults, which are seemingly normal forms of communication but harm the target via commenting on work/school performance and abilities (e.g., "don't let them express opinions"; Kaukiainen et al., 1997; Kaukiainen et al., 2001).

Six other items were included as exploratory items, but they did not reasonably belong to any of the above categories (e.g., "play nasty jokes," "make negative glances and gestures").

Demographic data (specifically gender and age) were obtained to examine relationships between these variables and FOA. Since various factors may influence differences between the high school and college samples (age, academic achievement, maturity), we were most interested in examining how the instrument

functions in these two populations. This information would be helpful to future researchers interested in using the instrument across various settings.

Data Analyses

We conducted principal axis factor analyses (PAF), using a promax rotation for correlated factors, based on data showing that the common factor model (e.g., PAF) has various advantages compared to principal components analysis (see Brown, 2006). The PAF was conducted on RS1 across both university and high school samples, followed by CFAs on RS2 to evaluate the fit of the factor structure. Model fit on RS2 was evaluated using the comparative fit index (CFI) and the root mean square error of approximation (RMSEA). Typically, models with CFI values greater than .95 and RMSEA values less than .06 are considered good fits to the data (Hu & Bentler, 1999). However, Bollen (1989) observed that these cutoffs are arbitrary and that a more appropriate criterion is to compare the fit of one's model to the fit of other models of the same phenomenon. Therefore, we compared the factor structure derived from EFAs with alternative factor structures based on the limited research literature in this area (e.g., direct-indirect model). The Akaike Information Criterion (AIC) was also used to make model comparisons because it penalizes for complexity (rewards parsimony) in models. Models with larger AIC values provide a less adequate fit to the data.

Study 1 Results

EFAs on RS1

PAF, with promax rotation (Brown, 2006), was conducted on the 66 initial items of the FOA in RS1. We investigated whether the items formed distinguishable factors, similar in content to the hypothesized categories that guided initial item selection (e.g., six factors representing Physical, Verbal, Property, Relational, Passive, and Rational-Appearing FOA). The exploratory PAF revealed 11 factors with Eigenvalues above one, accounting for 63% of the variance, but only five of the rotated factors contained more than two items that loaded highly on them. Examination of the item factor loadings suggested that four of the six original categories could be identified as separate components. However, the rational-appearing and passive aggression items loaded on the same factor, which suggests that these items may represent a similar construct or a single

manifestation of aggression. The scree-plot also suggested a four- or five-factor solution. To guide item selection, we followed recommendations by Brown (2006). We used initial criteria that the items could not cross-load (i.e., load $> .40$ on more than one factor), the items could not have small loadings on all factors ($< .40$), and the items had to load with more than one other item on a factor. The first criterion (cross-loadings) was applied so that the factors extracted did not contain overlapping items as a way of ensuring distinct dimensions, as recommended by Brown (2006). Any items that did not meet the inclusionary criteria across both samples (university and high school) were removed. Based on these criteria, 13 items were dropped from subsequent analyses.

As per Brown (2006), the next step was to conduct a PAF on the remaining items to extract five factors. Examination of the item loadings revealed five clearly delineated factors, accounting for 52% of the variance. From these analyses, 13 items were identified that cross-loaded or did not load highly (at least $.40$) on any of the factors across the two samples. These items were removed and a final factor analysis was conducted. The final five factors (40 total items) accounted for 55% of the variance and were termed Physical, Property, Verbal, Relational, and Passive-Rational (a combination of passive and rational-appearing items) FOA. Table 1 lists the final set of items, means, Cronbach's alpha, Eigenvalues, and item loadings for each FOA subscale in RS1.

University Versus High School Participants in RS1

For the sake of completeness, we also conducted PAFs on the final 40-item set in the RS1 university and high school participants separately. These analyses revealed a similar factor structure for both subsamples, except that the Verbal and Passive-Rational items cross-loaded for the university but not high school students. Thus, college students showed stronger concordance between behaviors associated with overt verbal aggression (e.g., cursing and shouting) and those involving more subtle comments made about the target's abilities or character (e.g., insinuating he or she has problems).

The intercorrelations between the five subscales and the internal consistency coefficients of RS1 are presented in Table 2 separately for the university and high school participants. The internal consistency coefficients were $\geq .80$ for all subscales in both settings. To investigate whether the various FOA correlated more strongly with each other among students

Table 1
Descriptive Statistics, Internal Consistency Coefficients, Eigenvalues, and
Item Loadings for the FOA Factors in Random Sample 1 (RS1)

	Factors				
	PA	PP	VA	RA	P-R
<i>M</i> (<i>SD</i>)	9.5 (3.5)	7.5 (1.9)	16.2 (6.0)	12.2 (4.3)	13.4 (5.2)
Cronbach's alpha	.90	.86	.87	.84	.88
Eigenvalues	8.1	6.6	8.6	9.2	9.0
Items and item loadings					
I start fights	.50	.01	.15	.05	-.04
I threaten them physically	.71	.03	.20	-.17	.05
I hit, kick, or push them	.69	-.02	.07	-.02	.08
I physically hurt them	.86	.08	-.03	-.03	-.01
I throw something at them	(.38)	.29	.16	.07	-.18
I hit them in the face or head	.84	.06	-.03	.06	-.09
I beat them up	.84	.04	-.13	-.01	.07
I hold them down to the ground	.57	.35	-.04	-.01	-.003
I steal their things	.07	.48	.01	.20	-.14
I start a fire that causes damage	.05	.56	-.07	.03	-.03
I harm their property	.20	.51	-.04	.05	.08
I vandalize their house or things	.16	.69	.01	-.11	.03
I damage their property	.08	.75	-.14	-.07	.19
I mess up their work	-.01	.62	-.04	.12	.05
I put them down	.19	-.04	.72	-.09	-.04
I say mean things to them	.17	-.09	.69	-.04	.05
I curse them out	.24	-.06	.57	.10	-.07
I argue with them	.07	-.09	.72	-.04	.01
I blame them unfairly	-.16	.19	.51	.16	.04
I tease them	.09	.07	.49	.14	.04
I try to get the last word	-.06	-.04	.66	.03	.04
I get sarcastic with them	-.14	-.10	.63	.02	.11
I ruin their friendships with other people	.07	.20	-.03	.60	-.16
I tell my friends to stop liking them	-.02	.09	-.06	.74	-.04
I keep them from being in my group of friends	.18	-.25	-.01	.68	.10
I tell them that I won't be their friend anymore	.19	-.14	-.01	.51	.15
I gossip or spread rumors about them	-.28	.17	.19	.58	-.05
I make sure they get left out	.04	-.06	.07	.62	.12
I isolate them	.03	-.10	-.003	.54	.16
I become friends with someone else as revenge	-.05	.17	-.08	.54	.06
I tell their secrets	-.20	.15	.10	.41	.04
I interrupt them on purpose (RA)	-.02	.05	.15	.16	.41
I refuse to listen to them (P)	.04	-.11	.07	.21	.44
I insinuate that they have "problems" (RA)	.07	.02	.12	.14	.70
I don't help them when they need my help (P)	.12	-.12	-.19	.08	.57
I don't let them express their opinions (RA)	-.01	.05	-.06	.07	.65
I criticize their work, even if it is good (RA)	-.11	.22	.18	-.09	.75
I criticize their judgments or decisions (RA)	-.14	.09	.20	-.15	.47
I openly dismiss their opinions (RA)	-.01	.05	.02	.01	.77
I take my time doing things they want me to do (P)	.04	.07	.09	.07	.41
FOA total score (40 items)					
<i>M</i> (<i>SD</i>)	58.6 (16.9)				
Cronbach's alpha	.93				

Note: RS1 $N = 785$ (university participants, $n = 360$; high school participants, $n = 425$). Item loadings $\geq .40$ are shown in bold, and those that did not meet the .40 cutoff in their respective scales are shown in bold and in parentheses. PA = Physical Aggression; PP = Property Aggression; VA = Verbal Aggression; RA = Relational Aggression; P-R = Passive-Rational Aggression; (P) = original Passive aggression items; (RA) = original Rational-Appearing items; FOA, forms of aggression.

Table 2
Intercorrelations Between FOA Subscales in University and High School
Participants in Random Sample 1 (RS1)

	1	2	3	4	5	α
1. Physical Aggression	—	.61**	.56**	.57**	.55**	.91
2. Property Aggression	.48**	—	.34**	.52**	.48**	.87
3. Verbal Aggression	.36**	.14**	—	.66**	.65**	.87
4. Relational Aggression	.25**	.27**	.56**	—	.75**	.85
5. Passive-Rational Aggression	.24**	.38**	.63**	.63**	—	.88
Internal consistency (Cronbach's alpha)	.88	.80	.87	.83	.86	

Note: RS1 $N = 812$ (university participants, $n = 371$; high school participants, $n = 441$). Correlation and internal consistency (Cronbach's alpha) coefficients for university and high school participants are presented below and above the diagonal, respectively (values for high school participants are in bold). FOA = forms of aggression.

** $p < .01$.

in one setting versus the other, we conducted Fisher's z tests of differences between correlations. We used a Bonferroni-corrected significance level to control for the number of tests conducted (10 between-group tests), thus the alpha level used was $.05/10 = .005$. Significant group differences were found for the correlations between Physical Aggression and the Verbal, Relational, and Passive-Rational subscales, $z_s = 3.6, 5.5, -5.3$, all $p_s < .001$. The property subscale also correlated more highly with verbal and relational subscales in the high school than the university sample, $z_s = -3.0$ and -4.2 , $p_s < .005$. The high school students showed stronger concordance between engagement in aggression reflecting physicality (physical and property) and nonphysicality (verbal, relational) FOA relative to the college students. Nonetheless, the pattern of correlations was similar across both groups: Physical and Property, and Verbal, Relational, and Passive-Rational subscales correlated most highly with each other, respectively.

CFAs on RS2

The empirical fit of the five-factor solution derived from the EFAs was examined in RS2 using CFA in the computer program Mplus 4.0 (Muthén & Muthén, 2007). Based on the existing literature (Buss & Perry, 1992; Kaukiainen et al., 1997; Prinstein et al., 2001) and subscale intercorrelations (see Table 2), the five-factor model was compared to the following alternative factor structures: (a) a four-factor model in which the Physical and Property aggression items load on to the same factor and the Verbal, Relational, and Passive-Rational items load on to their own factors; (b) a two-factor model in which the Physical, Property, and Verbal items load on

one factor and the Relational and Passive-Rational items load on a second factor (direct vs. indirect model; Crick et al., 1997; Kaukiainen et al., 1997); and (c) a higher-order factor model in which the five latent factors load on to two higher-order factors: Physical and Property factors load on a higher-order *Physicality* factor, and Verbal, Relational, and Passive-Rational load on a higher-order *Nonphysicality* factor.

There was substantial skewness and kurtosis in the item data: $M_{skew} = 3.4$ (2.2), $Range_{skew} = 0.5-8.5$, $M_{kurt} = 19.4$ (22.4), $Range_{kurt} = -0.7-84.0$. Therefore, we used robust maximum likelihood estimation in Mplus which is recommended for dealing with nonnormality in the data.¹ In addition, the error variances of four sets of items that had similar wording or meaning (e.g., "put down" and "say mean things," "ruin their friendships" and "tell my friends to stop liking them") were allowed to covary. This was done with the acknowledgment that items within categories may correlate due to methodological and not conceptual reasons (e.g., similar words appear across both items). Before comparing the models, we first established whether there was measurement invariance in the five-factor model between the university and high school samples in RS2 by comparing the fit of an unconstrained model to that of (a) a model in which the factor loadings were constrained and (b) one in which factor loadings, item intercepts, item residuals, factor variances, and factor covariances were all constrained to be equal across the university and high school samples (see Brown, 2006). The unconstrained and two constrained models did not differ significantly in terms of level of fit, according to chi-square difference tests and fit indexes: (a) loading-constrained model: $\chi^2(1,489) = 2,675.12$, $\Delta\chi^2(35) = 12.53$, $p > .05$, CFI =

Table 3
Chi-Square Statistics and Fit Indexes for the Five-Factor Model and
Alternative Factor Models in Random Sample 2 (RS2)

	<i>df, χ^2</i>	CFI	RMSEA	AIC
Five-factor model				
Combined samples	726, 1,497.99****	.89	.038	42 433
University	726, 1,341.44****	.87	.048	21 257
High school	726, 1,293.39****	.84	.047	20 465
Alternative models				
A. Four-factor model				
Combined samples	730, 1,705.01****	.86	.068	43 536
University	730, 1,573.33****	.82	.056	21 636
High school	730, 1,371.41****	.82	.049	20 582
B. Direct vs. indirect				
Combined samples	735, 2,708.33****	.72	.061	45 456
University	735, 2,309.61****	.66	.077	22 798
High school	735, 1,725.50****	.72	.061	21 300
C. Higher-order model				
Combined samples	730, 1,551.00****	.88	.039	43 240
University	730, 1,379.21****	.86	.049	21 308
High school	730, 1,322.66****	.83	.048	20 515

Note: RS2 $N = 724$ (university participants, $n = 365$; high school participants, $n = 359$). df = degrees of freedom; χ^2 = chi-square goodness of fit statistic; CFI = comparative fit index; RMSEA = root mean square error of approximation; AIC = Akaike information criterion. Bold entries signify the statistics for the combined sample (combining university and high school students). **** $p < .001$.

.85, RMSEA = .047; (b) full-constrained model: $\chi^2(1,577) = 2,979.06$, $\Delta\chi^2(123) = 86.35$, $p > .05$, CFI = .82, RMSEA = .050.² These results suggested that there is reasonable measurement invariance across the university and high school samples and provided a foundation for combining the two samples in subsequent analyses. Nonetheless, we also conducted the CFAs separately for the university and high school samples to ensure adequate fit (see Brown, 2006).

Table 3 displays the fit indexes for the five-factor model and alternative models across all participants and in the university and high school samples separately in RS2. As demonstrated in Table 3, the five-factor model showed the best fit to the data across all indexes and both samples compared to the other models, although the CFI value for this model (.89) across all participants did not reach the recommended cut-off. Nonetheless, the RMSEA value was well within recommended guidelines and the AIC value was lowest for this model relative to the other models. The higher-order model (five latent factors load on to two higher-order factors) was the second best fitting model, reflecting the fact that the physical and property latent factors, as well as the verbal, relational, and passive-rational factors, were each measuring overlapping constructs, respectively.³

Replicability in Male and Female Participants

We next examined whether (a) there was measurement invariance across male and female participants, and (b) whether the five-factor model showed similar fit across the two genders ($N_s = 827$ and 683 for female participants and male participants, respectively). First, the model in which loadings were constrained across genders did not differ significantly from the unconstrained model: loading-constrained model, $\chi^2(1,489) = 2,620.47$, $\Delta\chi^2(35) = 33.49$, $p > .05$, CFI = .85, RMSEA = .046. However, when the other parameters were constrained, there was a significant decrement in fit from the unconstrained model to the full-constrained model: $\chi^2(1,577) = 4,153.88$, $\Delta\chi^2(123) = 900.49$, $p < .001$, CFI = .65, RMSEA = .067. The results were the same whether data from RS2 or data from the whole data set (both random samples) were used. Thus, a CFA was conducted separately in all the male and female participants. The fit indexes for the five-factor model were similar across genders: Female, $\chi^2(765) = 1,461.31$, CFI = .88, RMSEA = .033; Male, $\chi^2(765) = 1,497.40$, CFI = .90, RMSEA = .037. None of the other factor models tested above showed significantly better fit to the data in the male or female participants.

The internal consistencies of the subscales were well above .80 for both genders, except for the relational aggression subscale with an alpha of .77 in female participants. The intercorrelations between the subscales were also similar across the male and female participants: both showed a pattern of intercorrelations in which the Physical and Property subscales and the Verbal, Relational, and Passive-Rational subscales correlated most highly with each other, respectively. Gender differences (at $p = .05/10 = .005$) were detected in the correlations between Property and Relational, $z = -7.43$, and Property and Passive-Rational, $z = -4.92$, all $p_s < .005$. Male participants showed stronger associations ($r_s = .60, .52$) between these FOA compared to female participants ($r_s = .31, .32$). Overall, male participants showed higher concordance between property and the nonphysicality subscales. The subscales' internal consistencies and intercorrelation coefficients for the male and female participants separately are available on request from the first author.

Gender and Setting Correlates of FOA

T tests were conducted to compare the means for male and female participants on the FOA subscales (five-factor model). Besides individual subscale scores, we calculated a FOA total score based on the sum of subscale scores.⁴ As shown in Table 4 (top half), significant gender differences (using a restricted alpha value for the number of tests performed, i.e., $p = .05/6 = .008$) were found for Physical, Property, Verbal, Passive-Rational, and total FOA aggression scores, with boys reporting higher levels of these FOA than girls. In fact, the only subscale in which the genders did not differ was Relational aggression. Results were the same when genders were compared within the university and high school samples separately. Further, we divided the sample into developmental categories: ages 14 to 15 ($n = 318$), ages 16 to 17 ($n = 405$), ages 18 to 19 ($n = 541$), and age 20 and over ($n = 196$). Interestingly, gender differences were robust for Physical and Property aggression across all developmental groups, and there were no gender differences in Relational aggression in any of these age groups. Male participants reported significantly more Verbal aggression, and marginally more Passive-Rational aggression, than female participants only in the >20 years old cohort ($M_s = 18.3, 15.5$ vs. $M_s = 15.8, 13.7$, respectively), $t_s(192) = -3.0, -2.4$, $p_s = .003$ and $.02$, respectively.

Next, we examined whether the university and high school students differed in FOA subscales. Differences in mean scores between the university and high school students were observed for Physical, Verbal, Passive-Rational and FOA total aggression scores (see Table 4, bottom half). The high school students scored slightly higher than the university students on Physical aggression, but the university students reported more use of Verbal and Passive-Rational aggression relative to the high school students. These data suggest that the different FOA were differentially more prevalent in high school and college.

Study 1 Summary

The results of Study 1 suggest the FOA items fit a five-factor model (Physical, Property, Verbal, Relational, and Passive-Rational) better than other factor models, including the ubiquitous Direct-Indirect model. The higher-order model was the second best-fitting model, in that Physical and Property aggression and Verbal, Relational, and Passive-Rational aggression latent factors loaded on to the higher-order Physicality and Nonphysicality latent factors, respectively. The different subscales were reliably observed in male and female participants and in the university and high school samples, providing evidence that the different categories of FOA generalize across samples. Analysis of the demographic correlates revealed significant gender differences across all of the FOA subscales, with the exception of Relational aggression, which was reported with equal frequency in male and female participants within both university and high school samples. Different FOA were also differentially more prevalent in high school and college. Physical aggression was reported more often by high school than college students, but Verbal and Passive-Rational aggression was endorsed more often among university participants. Relational aggression was similarly prevalent in high school and university samples.

Study 2

The aim of Study 2 was to examine the fit of the different factor structures in a new sample of college students, with mixed ethnicity. We investigated whether the factor loadings were similar to those observed in Study 1. Moreover, we sought to identify anger and personality correlates of the self-reported

Table 4
Gender and Setting (University vs. High School) Differences in FOA Subscales

	Female Participants <i>M (SD)</i>	Male Participants <i>M (SD)</i>	<i>t, df</i>
Physical Aggression	8.8 (2.0)	10.3 (4.2)	-9.0****, 977
Property Aggression	6.2 (1.0)	6.7 (2.2)	-5.9****, 974
Verbal Aggression	15.6 (5.5)	17.1 (6.6)	-4.7****, 1,392
Relational Aggression	12.2 (4.9)	12.3 (4.7)	-0.3, 1,565
Passive-Rational Aggression	13.1 (4.7)	14.0 (5.6)	-3.4****, 1,386
Total Aggression	55.9 (14.7)	60.4 (18.7)	-5.2****, 1,332
	University	High School	
Physical Aggression	9.3 (2.8)	9.7 (3.6)	-2.7***, 1,534
Property Aggression	6.3 (1.4)	6.5 (1.9)	-1.9, 1,480
Verbal Aggression	17.0 (5.9)	15.7 (6.1)	4.4****, 1,565
Relational Aggression	12.5 (4.2)	12.0 (5.2)	1.9, 1,565
Passive-Rational Aggression	14.4 (5.1)	12.7 (5.1)	6.6****, 1,548
Total Aggression	59.5 (15.1)	56.6 (18.1)	3.5****, 1,565

Note: Female $n = 855$; Male $n = 712$, across samples; University Sample $n = 744$; High School Sample $n = 823$. Female $n = 408$; Male $n = 316$. $df =$ degrees of freedom; $t = t$ -test statistic.

*** $p < .005$. **** $p < .001$.

aggressive behaviors that emerged from Study 1 to confirm the construct validity of the subscales and to empirically differentiate them (cf. Werner & Crick, 1999). In this new sample of university students, it was expected that most of the FOA subscales would correlate with validated measures of anger and aggression, and different FOA should show differential relationships with measures of personality traits (e.g., physical FOA should relate more strongly to impulsive traits such as reversed conscientiousness, whereas psychological maladjustment would be associated with more relational aggression; Werner & Crick, 1999).

Study 2 Method

Participants

Data on the final 40-item set of FOA items and anger and personality correlates were collected from a sample of university students at the University of Pennsylvania ($N = 192$; 55% women) recruited from introductory Marketing classes. The majority of the participants (84%) were between 18 and 23 years old. The ethnic distribution was diverse: 41% were Caucasian and 41% identified as being of Asian descent. The rest were identified as African American (8%), Hispanic (6%), or "other ethnicity."

Measures

Participants were administered the final 40-item FOA questionnaire (extracted from Study 1) along with other personality and anger questionnaires to further assess the construct validity of FOA in a mass testing session. Participants completed the 34-item version of Buss and Perry's (1992) AQ (Buss & Warren, 2000), which asks participants to rate their aggressive tendencies on a 5-point scale from 1 (*Extremely Uncharacteristic of Me*) to 5 (*Extremely Characteristic of Me*). The AQ yields five subscales: Physical Aggression (e.g., "If someone hits me, I hit back."), Verbal Aggression (e.g., "I argue a lot."), Hostility (e.g., "Other people always seem to get the breaks."), Anger (e.g., "I have trouble controlling my temper."), and Indirect Aggression (e.g., "When someone really irritates me, I may give him or her the silent treatment."). The new sample also completed the 50-item version of the International Personality Item Pool (IPIP; Goldberg, 1992; Goldberg et al., 2006) a widely used measure that indexes the Big Five personality domains: Extraversion (talkative, energetic, assertive; e.g., "Am the life of the party"), Conscientiousness (organized, careful; thorough; e.g., "Am always prepared"), Agreeableness (lower scores indicate higher levels of antagonism; e.g., "Am interested in people"), Neuroticism/Emotional Instability (anxiety; e.g., "Get stressed out easily") and Openness (varied interests, imaginative; e.g., "Have a vivid imagination");

Goldberg, 1992). Participants were asked to rate how accurate each statement was on a 5-point scale from 1 (*Very Inaccurate*) to 5 (*Very Accurate*).

Study 2 Results

Factor Structure in New Sample

The 40 items of the FOA were subjected to a PAF to extract a five-factor model. We could not conduct CFAs in this sample, due to the small sample size. Kline (1998) recommends that for complex models with many parameters, sample sizes should be at least 200, or preferably a 20:1 ratio for the number of participants to the number of model parameters (although he suggests that a 10:1 ratio is a more realistic target). With 40 items on the FOA and many more model parameters, a sample size of 192 was insufficient to provide stable parameter estimates using CFA. Sample size recommendations are more modest for EFAs (e.g., Hutcheson & Sofroniou, 1999, recommend 150-300 participants), which is why we chose to examine the factor structure using EFA.

Factor analyses revealed that the physical and property items loaded on the same factor. Thus, a four-factor model was subsequently extracted using PAF, which accounted for 58% of the variance. See Table 5 for means, internal consistency coefficients (Cronbach's alpha), Eigenvalues, and item loadings for the four factors in this new university sample. The item loadings corresponded to the appropriate factors, with a few exceptions. In particular, three of the passive-rational items did not load highly on any factor or loaded most highly on the verbal or relational factors. One of these items ("I take my time doing things") had a low correlation with the Total Passive-Rational subscale (.31; it was .29 in RS1), but the other two items showed robust item-total correlations (.50-.54). In all, analyses on this sample suggest that physical and property items may represent a single form of aggression, which was mirrored in the higher-order factor model observed in Study 1, and the passive-rational factor may be less coherent. Differences in the factor loadings may be due to the ethnic distribution of this new sample. Sample sizes within each ethnic group were small ($n_s = 79$ for Caucasian and Asian descent groups), which prevented us from conducting reliable analyses separately by ethnic group (Hutcheson & Sofroniou, 1999). On the other hand, the Caucasian and Asian descent samples did not differ in their mean scores on any of the FOA subscales.

Construct Validity in New Sample

In terms of gender differences, male participants reported higher levels of Physical, Property, and Verbal aggression than did female participants ($M_s = 10.1, 7.0, 19.0$ vs. $M_s = 9.1, 6.4, 17.1$, respectively), $t_s(190) = -2.1, -2.2, -2.2$, $p_s < .04$, similar to what was observed in Study 1. Also consistent with the results of Study 1, there was no gender difference in Relational aggression. Unlike Study 1 though, the genders did not differ in Passive-Rational aggression either.

Table 6 illustrates the correlations between the FOA subscales with the AQ and IPIP five-factor personality scales. As for the AQ correlates, the FOA subscales showed adequate convergent validity, in that the subscales that were expected to converge across the FOA and AQ did so (e.g., Verbal, Physical, and Indirect Aggression subscales across both FOA and AQ). On the other hand, the subscales carrying the same names across both instruments were not exactly equivalent, and the total scores of the FOA and AQ were correlated .65 (share about 42% of variance). Thus, the FOA and AQ each assess unique aspects of aggressive tendencies. The FOA subscales also showed discriminant validity. For example, FOA Relational aggression showed somewhat low correlations with most AQ subscales, except the Indirect subscale, as would be expected (see Table 6).

As for the personality correlates, the pattern of correlations between FOA and IPIP subscales suggest that persons who engage in Physical and Property aggression show a personality profile marked by low agreeableness and low conscientiousness (Miller & Lynam, 2006). Those who engage in Verbal, Relational, and Passive-Rational aggression show this similar profile but also exhibit higher levels of neuroticism. Thus, nonphysicality shows stronger relationships with emotional maladjustment relative to physicality subscales such as Physical and Property. FOA subscales were negligibly correlated with Extraversion and Openness to Experience (see Table 6). In summary, the results of Study 2 confirm convergent and discriminant validity of the FOA subscales and support previous research on the correlates of different FOA.

General Discussion

Factor Structure and Psychometric Properties

Factor analyses of items that were selected to measure different FOA revealed a five-factor model across

Table 5
Descriptive Statistics, Internal Consistency Coefficients, Eigenvalues,
and Item Loadings for Four Factors in Study 2

	Factors			
	PA/PP ^a	VA	RA	P-R
<i>M</i> (<i>SD</i>)	13.9 (4.4)	18.0 (5.9)	14.4 (5.4)	17.7 (5.5)
Cronbach's alpha	.92	.86	.88	.89
Eigenvalues	10.1	8.2	8.3	6.4
Items and item loadings				
I start fights	(.17)	.42	-.22	.18
I threaten them physically	.53	.44	-.24	.08
I hit, kick, or push them	.56	.35	.01	-.21
I physically hurt them	.91	-.07	-.28	.25
I throw something at them	.65	.24	.08	-.08
I hit them in the face or head	.96	.04	-.07	.06
I beat them up	.92	-.22	.04	-.02
I hold them down to the ground	.81	-.01	.05	.26
I steal their things	.40	.07	.22	-.27
I start a fire that causes damage	.72	-.07	.33	-.32
I harm their property	.85	-.07	.01	.07
I vandalize their house or things	.88	-.004	.15	-.23
I damage their property	.85	-.06	-.09	.14
I mess up their work	.48	-.07	.03	.33
I put them down	-.05	.68	.28	-.12
I say mean things to them	-.09	.72	.20	.05
I curse them out	.12	.62	-.01	.05
I argue with them	-.01	.71	-.19	.14
I blame them unfairly	-.19	(.04)	.04	.43
I tease them	.20	.38	-.04	.35
I try to get the last word	.09	.60	.06	.18
I get sarcastic with them	.20	.61	.07	.32
I ruin their friendships with other people	.25	.14	.59	-.01
I tell my friends to stop liking them	-.02	-.03	.75	.18
I keep them from being in my group of friends	-.07	-.08	.71	.27
I tell them that I won't be their friend anymore	-.20	-.07	.53	.12
I gossip or spread rumors about them	.12	.03	.54	-.04
I make sure they get left out	.02	.05	.56	.24
I isolate them	-.05	-.02	.66	.34
I become friends with someone else as revenge	.06	-.13	.58	-.27
I tell their secrets	.16	-.09	.58	.10
I interrupt them on purpose (RA)	.02	.32	.20	(.32)
I refuse to listen to them (P)	.15	.19	.15	.57
I insinuate that they have 'problems' (RA)	.16	.09	.21	.54
I don't help them when they need my help (P)	-.03	.06	.30	.44
I don't let them express their opinions (RA)	.01	.35	.14	(.13)
I criticize their work, even if it is good (RA)	-.13	.14	.35	(.21)
I criticize their judgments or decisions (RA)	.01	.22	-.04	.64
I openly dismiss their opinions (RA)	-.01	.23	.02	.67
I take my time doing things they want me to do (P)	-.04	.20	.25	(-.01)
FOA Total Score (40 items)				
<i>M</i> (<i>SD</i>)		66.3 (17.7)		
Cronbach's alpha		.94		

Note: Study 2 New university sample, $N = 192$. PA = Physical Aggression; PP = Property Aggression; VA = Verbal Aggression; RA = Relational Aggression; P-R = Passive-Rational Aggression; (P) = original Passive aggression items; (RA) = original Rational-Appearing items. Item loadings $\geq .40$ are shown in bold, and those that did not meet the .40 cut-off in their respective scales are shown in bold and in parentheses.

a. M (SD) and Cronbach's alpha for Physical and Property subscales, separately, in Study 2 were Phys: M (SD) = 9.6 (3.4), $\alpha = .89$; Prop: M (SD) = 6.7 (1.9), $\alpha = .87$.

Table 6
Correlations Between FOA Subscales and AQ Subscales and
Five-Factor Personality Traits in Study 2

	<i>FOA Subscales</i>					
	<i>Physical</i>	<i>Property</i>	<i>Verbal</i>	<i>Relational</i>	<i>Passive-Rational</i>	<i>Total Score</i>
AQ Subscales						
Physical	.67****	.52****	.54****	.24****	.42****	.57****
Verbal	.43****	.21****	.54****	.12	.38****	.45****
Anger	.47****	.32****	.52****	.33****	.44****	.54****
Hostility	.31****	.23****	.41****	.33****	.40****	.45****
Indirect	.42****	.34****	.47****	.44****	.51****	.57****
Total AQ	.58****	.42****	.62****	.37****	.54****	.65****
IPIP Subscales						
Neuroticism	.07	.01	.20****	.20****	.21****	.21****
Extraversion	-.02	-.09	-.01	.00	.00	-.01
Openness	-.02	-.15**	-.08	.03	.03	.02
Agreeableness	-.32****	-.32****	-.30****	-.30****	-.29****	-.38****
Conscientiousness	-.36****	-.29****	-.21****	-.15**	-.12	-.25****

Note: Study 2 New University sample, $N = 192$. Correlations in bold are those calculated between the same or similar subscales across the FOA and AQ. FOA = Forms of Aggression Questionnaire; AQ = 34-item Aggression Questionnaire (Buss & Warren, 2000); IPIP = International Personality Item Pool (Goldberg, 1992).

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

high school and university students in Study 1, although a higher-order model in which the five factors loaded on two higher-order latent factors, Physicality and Nonphysicality, may also be appropriate. Good internal consistency ($\alpha > .80$) was found for FOA subscales across subsamples of university, high school, female, and male participants. These findings also show consistency with previous work that included only a subset of categories. The current study shows that physical, verbal, relational, and passive-rational aggression can be distinguished from each other when assessed concurrently. Importantly, it is clear that the items did not form dimensions of direct versus indirect aggression, suggesting that the categories assumed to account for different FOA should be reconsidered.

On the other hand, although RMSEA and AIC values showed good fit for the five-factor model, CFI values were below recommended cutoff. Furthermore, a four-factor model predominated in Study 2. This less-than-optimal fit may be due to some inconsistencies that were found across Studies 1 and 2. For example, our analyses suggested that physical and property aggression items were distinct from each other in Study 1 but not in Study 2, although the higher-order Physicality versus Nonphysicality model in Study 1 was somewhat consistent with Study 2 results (in that physical and property items co-occur highly). Physical and property aggression are typically combined in the same subscale in other instruments (e.g.,

Buss & Perry, 1992; Richardson & Green, 2003), although recent work indicates they are separate sub-factors (Krueger et al., 2007).

The inconsistent physical and property aggression loadings reported in this article may reflect differences across samples. First, inconsistencies in factor structure across the two studies may be due to ethnic differences in the co-occurrence of different FOA or their severity and frequency. More important, the sample size for Study 2 was limited; thus, we could not optimally examine whether the five-factor model showed adequate fit in the Study 2 sample using CFA. It was encouraging that in the large sample obtained for Study 1, factor loadings did not seem to differ across high school and university students or across female and male students, although there were gender differences when we constrained other parameters (such as intercept and residuals). Thus, although there may be some measurement bias when it comes to gender, the items within subscales seem to have equal relevance across the subgroups. Nonetheless, more work needs to be conducted to understand subtle differences in the factor structure across subgroups of individuals, including comparing CFA results across subsamples to empirically determine if the five-factor model or other factor models reliably show adequate fit.

Another unexpected finding was that the initial set of passive and rational-appearing items loaded on the same factor across samples in Study 1. Although

unexpected, this result is not surprising as the two sets of items represent attempts to impede the school or work goals of another person through techniques such as subtly undermining the person's abilities or withholding assistance (Björkqvist et al., 1994). However, the combined Passive-Rational factor cross-loaded with the verbal aggression items in the Study 1 university sample and showed less coherence in Study 2's new sample of university students. This suggests that more work needs to be conducted to examine the distinctness of the items that comprise this factor. Some of the overlap with verbal aggression is probably due to the fact that, in both types of aggression, verbal communication is primarily used, especially among college students who may typically rely on verbal means to harm others (see below).

The examination of factor structure in this article provides important directions for future research on aggression subtypes. Next steps include (a) examining the factor structure across different cultural and demographic groups, (b) investigating the stability of the factor structure in forensic or clinical samples where the severity of aggressive behavior is presumably higher, and (c) analyzing whether FOA are associated with different psychological outcomes to aid in risk assessment. Development of the FOA allows for this future research to be accomplished efficiently.

Correlates of Different FOA

Supporting the existence of different factors, FOA subscales were differentially related to key demographic and psychological variables. In Studies 1 and 2, we found that male participants were overall more aggressive than female participants across various FOA, particularly physical aggression, which replicates previous studies on gender differences in aggressive behavior (Bettencourt & Miller, 1996; Hyde, 1984). Unlike findings with young children (preschool: Crick et al., 1997; up to 12 years old: Crick, 1997), there was no gender difference in relational aggression in the Study 1 high school or university samples or in the Study 2 new university sample. Of course, given the self-report format, it is possible that demand characteristics or social desirability could have suppressed reports of relational aggression by girls relative to male participants. Nonetheless, our results are consistent with other research (Green et al., 1996; Paquette & Underwood, 1999) showing that, although relational aggression may be more prevalent among young female than male participants, older male

and female participants (after grade school) both report trying to hurt others through their relationships and friendships (Björkqvist, Lagerspetz, & Kaukiainen, 1992). Even though no gender differences in relational aggression were found during the developmental periods studied in this project, it is still possible that relational aggression is more developmentally salient (as it is used more often than other FOA) and associated with more psychological maladjustment for female than male participants (Crick & Zahn-Waxler, 2003).

Across both genders, college students relied more than high school students on nonphysicality than physicality to hurt others. In Study 1, we found that reports of physical and property aggression were reported more often in high school students than college students, and verbal and passive-rational FOA were more prevalent in college. Unfortunately, we cannot isolate what processes account for the differences observed between high school and college students. Age was confounded with setting in this study, in that younger participants were still in high school and older participants were in college. Thus, it is unclear whether their differential reliance on certain FOA is due to changes that naturally come about with age, or selection bias among those who end up in college. In contrast to these differences between high school and university samples, relational aggression was equally prevalent in both settings.

In Study 2, different subscales of the FOA showed construct-specific relationships with the AQ, though the FOA appeared to assess unique aspects of aggression not captured by the AQ. Relationships between FOA subscales and the IPIP Personality scales revealed that all FOA are associated with low agreeableness and low conscientiousness. In other words, individuals reporting higher levels of aggression were marked by a personality profile involving antagonistic interactions with others and impulsive, unreliable, or nonplanful tendencies (Krueger, 1999; Miller & Lynam, 2006). Limited research suggests that, in comparison to other FOA, relational aggression may be associated with increased extraversion or social aptness because relational aggression has been linked with social dominance and the existence of close social relationships (Murray-Close, Ostrov, & Crick, 2007; Prinstein et al., 2001). The FOA self-report data did not support this idea, in that extraversion was negligibly related to FOA subscales in Study 2. Instead, there was evidence that the nonphysicality subscales (Verbal, Relational, Passive-Rational) show stronger relationships with neuroticism/emotional instability than physical and property aggression. This result

supports the substantial body of research suggesting that different FOA may show specific relationships with psychopathology outcomes (Crick, 1997; Crick, Ostrov, & Werner, 2006; Murray-Close et al., 2007; Prinstein et al., 2001; Werner & Crick, 1999).

Limitations and Future Directions

The current project has a number of strengths, such as the inclusion of a variety of items spanning different FOA and the examination of the psychometric properties of the items in large samples of adolescents and emerging adults across both genders. Nonetheless, there are some limitations. One drawback of self-report measures is the tendency for individuals to underreport their aggressive behavior or to respond in the most socially desirable way (Lagerspetz et al., 1988; Pakaslahti & Keltikangas-Järvinen, 2000). On the other hand, the administration of this self-report questionnaire in large-scale mass testing situations gave respondents anonymity and reduced the likelihood that individuals underreported their aggressive behavior. As noted in Note 3, we found that excluding those who scored high on measures of social desirability did not affect the results of factor analyses. A second limitation of the study is the sole use of self-report measures to assess the psychological correlates of the FOA questionnaire, which raises the problem of shared-method variance and potential artificial inflation of correlations. Therefore, future validation research should seek to use prospective methods and correlate FOA with other discriminate outcomes such as actual behavior, laboratory processing paradigms, and peer ratings.

The participants in this study were asked to report the behaviors they used “when angry or upset.” Although this was done to provide a context for participants to endorse aggressive behaviors, it is possible that many participants responded to the items only in terms of reactive motives for aggression. This would mean that FOA has less utility for the study of instrumental aggression, though this has to be evaluated directly in future research. Indeed, we are currently collecting data on the FOA in which participants are asked to respond to the items according to when they “want to get something, or to win, or to look better in front of others” to extract the FOA used when engaging in instrumental aggression.

Finally, although we recruited participants across sites and settings, the samples were mostly composed of middle and upper-middle class participants who may show the lowest levels of aggression in the

population. Similarly, our emerging adult samples included only university students, who may exhibit different levels of FOA than the general population of emerging adults. For this reason, additional replications of the factor structure and validity of self-reported FOA need to be conducted across different samples, especially since we noted some inconsistencies in factor structure among a more ethnically heterogeneous sample. Despite some limitations, the FOA questionnaire can serve as a valuable tool for researchers interested in the large-scale study of multiple FOA among both adolescents and emerging adults.

Notes

1. We also conducted analyses in which the data were treated as ordered categories using Mplus mean and variance adjusted weighted least squares. With this estimation approach, analyses revealed that the CFI value was slightly larger (.92), RMSEA was a bit below adequate fit level (.067), and the conclusions from the analyses (i.e., best fitting model was the five-factor model) were equivalent to what was found using the robust maximum likelihood (MLM) estimation. For this reason and because we are making the assumption that there is a linear relationship between the Item Response Scale and theoretical variables of interest (FOA), we reported the results only for the robust maximum likelihood estimation analyses.

2. Mplus does not generate a chi-square difference test for robust maximum likelihood estimation, because MLM uses the Satorra-Bentler scaled chi-square for continuous nonnormal data. Thus, the chi-square difference tests were calculated using formulas developed by Satorra (2000) and found in the Mplus Technical Appendices located on the Mplus Web site (<http://www.statmodel.com>).

3. Social desirability or defensiveness may affect participants' willingness to endorse aggressive behaviors and may artificially inflate inter-item associations. In Study 1, a subset of the university participants ($N = 259$) completed the Multidimensional Personality Questionnaire (Tellegen, 1982) Unlikely Virtues subscale, and a subset of the high school students ($N = 808$) completed the Balanced Inventory of Desirable Responding (Paulhus, 1991). These are measures of socially desirable responding. We computed the 75th percentile on the respective measure for the university and high school students and subsequently excluded those individuals scoring above this cutoff ($n_s = 34$ and 297, respectively) when conducting a CFA on the rest of the participants for the five-factor model. Fit indexes were similar to the ones reported above in the remaining participants, $\chi^2(765) = 1,823.52, p < .001, CFI = .90, RMSEA = .034$.

4. We also computed total scores in which each subscale was equally weighted (i.e., we calculated the mean rating for items in each subscale—all measured on a 1 to 5 scale—and averaged mean item ratings across subscales to create a total score). We then computed mean differences between college and high school students and between genders on this new total score. The results were functionally the same as with the sum total across items; thus, we retained the latter total score calculation.

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