

Differentiating Forms and Functions of Aggression in Emerging Adults: Associations with Hostile Attribution Biases and Normative Beliefs

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Abstract The purpose of this study was to extend the current literature on forms (i.e., physical and relational) and functions (i.e., proactive and reactive) of participants' cognitions and beliefs about aggressive behavior. Participants included an ethnically diverse group of emerging adults ($N = 165$; $M = 19.05$ years; $SD = 1.55$) and completed a battery of self-report instruments. Gender differences for subtypes of physical aggression were found. Impulsivity was associated with all subtypes of aggression. Results showed that reactive physical aggression was uniquely associated with hostile attribution biases for instrumental provocation situations. Reactive relational aggression was uniquely associated with hostile attribution biases for relational provocation scenarios. Findings indicated links between self-reported subtypes of aggressive behavior and normative beliefs of aggression. Ways in which this study extends the extant literature are discussed.

Keywords Relational aggression · Hostile attribution biases · Normative beliefs · Functions of aggression

Understanding the complexity of aggressive behavior has been an important research endeavor across development (Dodge and Pettit 2003). Aggression is defined as behaviors with the intent to hurt, harm or injure others (Dodge et al. 2006). Prior research (e.g., Little et al. 2003; Ostrov

and Crick 2007; Prinstein and Cillessen 2003) has classified aggressive behaviors on two specific dimensions. The first dimension relates to the “form” of the aggressive behavior, expressed physically (i.e., use or threat of physical force) or relationally (i.e., via damage or threat of damage to relationships). The second dimension concerns the specific “function” that the aggressive behavior serves, which can be either reactive (i.e., impulsive, anger oriented and in response to a threat) or proactive (i.e., goal oriented and often calculating) in nature.

Past research has shown distinct relations between gender and aggressive forms. The extant literature has indicated that preschoolers and school-aged children report that relationally aggressive behavior is the most common form of aggression among girls and in some cases even have memory preferences for interactions that fit this schema (Giles and Heyman 2005). Men and younger boys are often classified as exhibiting higher levels of physical aggression as compared to women (e.g., Buss and Perry 1992; Dodge et al. 2006). In some developmental periods and depending on the culture and method of assessment, girls have been found to be more relationally aggressive than boys (e.g., Bonica et al. 2003; Crick and Grotpeter 1995; French et al. 2002; Hawley 2003; Ostrov and Keating 2004; Ostrov 2006; cf. Hart et al. 1998; Little et al. 2003; Tomada and Schneider 1997). Interesting new evidence has indicated that women may no longer be more relationally aggressive in the context of both peer and romantic relationships during the emerging adult period in comparison to men (e.g., Linder et al. 2002; Loudin et al. 2003). However, even if women are not significantly more relationally aggressive than men from 18 to 25 years of age it does appear that relationally aggressive behavior is more salient for their social-psychological well being and functioning compared to men (e.g., Werner and Crick 1999).

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Past research has discovered unique distinctions between proactive physical, also known as premeditated aggression, and reactive physical, or impulsive aggression (Stanford et al. 2003). Dodge and Coie (1987) indicated a link between reactive physical aggression and hostile attribution biases for instrumental provocations. Studies with elementary and junior high school students demonstrated that individuals who are highly aggressive in social settings, specifically in the display of reactive aggression, are more likely to exhibit hostile attribution biases when evaluating ambiguous provocation vignettes (Crick 1995; Crick and Dodge 1996; Crick et al. 2002; Nelson and Crick 1999). Furthermore, reactive (impulsive) physical aggression is characterized by deficits in verbal skills (Barratt et al. 1997) and executive functioning (Houston et al. 2003; Mathias and Stanford 1999). Along with psychopathic personality, self-reported and family alcohol use with co-morbid family violence has been associated with proactive aggression (Connor et al. 2004; Raine et al. 2006). Prior studies have found a correlation between impulsiveness, defined as the inability to restrain one's behavior or emotions (Ramirez and Andreu 2005) and both proactive and reactive physical aggression (Dodge 1991); yet additional research has associated impulsivity specifically with reactive physical aggression (Ramierz and Andreu 2005; Seroczynski et al. 1999).

The social-information processing (SIP) model, reformulated by Crick and Dodge (1994), has been widely used to explain the development of aggressive behavioral problems and negative social adjustments from early childhood to adolescence (Dodge et al. 2002; Egan et al. 1998; Lemerise et al. 2005; Shahinfar et al. 2001). Studies that have explored both forms of aggression have shown that participants classified as relationally aggressive exhibit hostile attribution biases for ambiguous provocation scenarios of a relational manner (Crick 1995; Crick et al. 2002), yet physically aggressive participants displayed hostile attribution bias for ambiguous provocation of an instrumental manner (Crick et al. 2002; cf. Crain et al. 2005). To date no known research has explored both forms and functions of aggression and hostile attribution biases for instrumental and relational provocation situations. Distinct differences between the forms of aggression, in relation to normative beliefs have also been discovered. Prior studies with elementary school children have correlated normative beliefs about physical aggression to physically aggressive behavior (Huesmann and Guerra 1997). In addition, normative beliefs about relational aggression have been correlated with relationally aggressive behavior (Werner and Nixon 2005). No known studies have explored forms and functions of aggression and normative beliefs for aggressive behavior.

Hypotheses

The first objective of this study was to examine gender differences for self-reported aggressive behavioral types. Based on the past developmental literature we predicted that men will self-report higher levels of the function types of physical aggression, in comparison to women. In contrast, we predicted that women would self-report higher levels of the function types of relational aggression, versus men.

Second, we tested the link between impulsivity and forms and functions of aggression. Prior research on impulsivity has focused primarily upon reactive aggression in its physical form (Harmon-Jones et al. 1996; Stanford et al. 1995) and has found a link between impulsivity and reactive physical aggression. No known research has explored the link between reactive relational aggression and impulsivity. Thus, based on the available literature, our second hypothesis is that reactive functions of aggression will be uniquely associated with impulsivity.

Third, we evaluated emerging adults' encoding and interpretation of social cues, or intent attributions. We investigated the link between aggression subtypes and hostile attribution biases (HAB) using a slightly adapted measure to include situations that emerging adults may experience (i.e., college setting). This study proposed to extend findings by investigating specific forms and functions of aggression and HAB for instrumental and relational provocation situations. In keeping with past research with children, we hypothesized a significant relation between self-reported reactive physical aggression and hostile attribution biases for instrumental provocation (Crick and Dodge 1996). This is the first known study to test the association between forms and functions of aggression and HAB for relational provocations. We predicted a unique association between self-reported reactive relational aggression and hostile attribution biases for relational provocations.

The fourth objective was to investigate emerging adults' normative beliefs about the types of aggressive behaviors. Past research has focused on general beliefs about physical aggression (Huesmann et al. 1992; Huesman and Guerra 1997; cf. Werner and Nixon 2005). For exploratory purposes, a new hypothetical response measure was used to test for participants' self-reported acceptable responses to specific forms and functions of aggression. We hypothesized an overall relation between self-reported aggressive behavior and normative beliefs about aggression. Furthermore, we explored possible unique associations between the specific aggressive forms and functions and normative beliefs about aggression.

Method

Participants

A total of 165 emerging adults (83 women) attending a large public university in an urban area of the northeast participated in the study. All participants were enrolled in an Introductory to Psychology (PSY 101) course, to which they received partial research credit for their participation in this study. All participants provided basic demographic information that included gender (coded male = 1; female = 2), age ($M = 19.05$ years, $SD = 1.55$), academic year in college ($M = 1.74$ years, $SD = .99$) and ethnicity. Ethnicity was somewhat diverse with 8% African American, 9% Asian American, 64% European American, 3% Latino, and 16% identifying as having multiple or other ethnic backgrounds.

Measures

Self Report of Aggression and Social Behavior Measure (SRASBM)

The SRASBM developed by Morales and Crick and published in Linder et al. (2002) was used to obtain participants' self-reports of aggressive behavior. This 39 item measure includes five items which assess proactive relational aggression (e.g., "I have threatened to share private information about my friends with other people in order to get them to comply with my wishes") and six items which assess reactive relational aggression (e.g., "When I am not invited to do something with a group of people, I will exclude those people from future activities"). The measure also includes three items, which assess proactive physical aggression (e.g., "I try to get my own way by physically intimidating others,") and three items, which evaluate reactive physical aggression (e.g., "When someone makes me really angry, I push or shove the person"). The measure also assessed additional behaviors for purposes of a different study. Responses for all items range from (1) "Not at all true" to (7) "Very true". This measure has acceptable internal consistency in the past (e.g., $\alpha = .73$ for romantic relational aggression; Linder et al. 2002) and in the present study Cronbach's α was generally acceptable for the four aggression subscales: proactive relational aggression, $\alpha = .69$; reactive relational aggression, $\alpha = .76$; proactive physical aggression $\alpha = .77$; reactive physical aggression, $\alpha = .79$. Given modest internal consistency reliability estimates, in particular for proactive relational aggression, the results should be interpreted with caution and await replication.

Barratt Impulsiveness Scale (BIS-11)

The BIS-11 developed by Barratt and revised by Patton et al. (1995) was used to acquire participants' self-reports of impulsive behavior. This 34-item measure (e.g., "I do things without thinking," "I act on impulse") includes four filler items. Responses ranged from (1) "rarely/never" to (5) "almost always/always." To maintain consistency with prior studies using college participants (Helfritz and Stanford 2006; Patton et al. 1995), all factors (i.e., attentional, motor and non-planning impulsiveness) were combined, thus leaving a total impulsiveness score. Patton et al. (1995) reported Cronbach's α 's that ranged from .79 to .83 for total impulsivity among emerging adults. In the present study, Cronbach's α for the total impulsivity score was .79.

Assessment of Intent Attributions

To assess for hostile attribution biases, participants received 10 hypothetical-situation vignettes developed by Fitzgerald and Asher and adapted in past literature by Crick (1995). The measure has been slightly modified for the current study to be appropriate for use with emerging adults. In each vignette, the provocateur's intent remained ambiguous, so that the participant had to decide if the intent of the provocateur was benign or hostile. The first question consists of four possible reasons for the provocation, two benign answer choices (e.g., "the student was planning to invite me later") and two hostile answers (e.g., "the students were making fun of me"), in which participants were asked to choose one answer. In the second question, participants were asked to decide if the provocateur's intent was hostile (e.g., "trying to be mean") or benign (e.g., "not trying to be mean"). The provocation vignettes are split into four instrumental (i.e., physical) provocation situations (e.g., "the student spills the drink all over your back") and four relational provocation situations (e.g., "you have not been invited to this party"). Furthermore, in order to avoid negative response biases, two new positively toned filler prosocial vignettes were included in this measure. For the prosocial vignettes, participants must decide if the intent was benign in nature (e.g., "the student wanted me to have the seat") or if there was no intent at all (e.g., "they forgot to take the flyer with them"). Acceptable internal consistency coefficients were reported by Crick (1995) for hostile intent attributions for instrumental provocation (i.e., Cronbach's $\alpha = .80$) and for hostile intent attributions for relational provocation (i.e., Cronbach's $\alpha = .74$). Similarly, Crick et al. (2002) reported Cronbach α 's that ranged between .77–.86 for instrumental provocation and .65–.78 for

relational provocation. In the present study, hostile intent attributions for instrumental provocation were reliable (Cronbach's $\alpha = .71$) and hostile intent attributions for relational provocation tended to be reliable (Cronbach's $\alpha = .64$), suggesting that some caution is needed when using the relational provocation scale.

Normative Beliefs of Subtypes of Aggression Scale (NBSAS)

The NBSAS was developed to assess participants' beliefs about the acceptability of various forms and functions of aggression. This measure is based on a widely used instrument that assesses the normative beliefs of physical aggression (normative beliefs about aggression scale (NOBAGS), Huesmann and Guerra 1997). For this measure, participants were asked to evaluate the response (e.g., physical, relational, and prosocial) of the protagonist (e.g., John/Julia) to a specific problem (e.g., proactive and reactive). In order to reduce the likelihood of gender biases in the perceptions of acceptable aggressive behavior (Ostrov et al. 2005), the gender of the protagonist was matched to the gender of the participant. This 12-item measure includes four physical aggression items (e.g., "John pushes a peer..."), two, which contain proactive functions (e.g., "...to get what he wants") and two which contain reactive functions (e.g., "...in response to being threatened by that peer") of physical aggression. The measure also includes four relational aggression items (e.g., "John spreads rumors about a peer..."), which contains two proactive (e.g., "...to maintain his social status") and two reactive functions (e.g., "...after being angered by that peer"). Finally, the measure included four prosocial behavior filler items (e.g., "John helps a peer..."), containing two proactive (e.g., "...to maintain his social status") and two reactive functions (e.g., "...after being angered by that peer"). Responses are from (1) "It's really wrong" to (4) "It's really ok," therefore, the higher the number selected, the greater the acceptance of the protagonist's behavior. Reliability coefficients for combined reactive and proactive physical aggression and reactive and proactive relational aggression were lower than .70 for these subscales. In order to maintain internal consistency, all aggression types were combined, with the exclusion of one proactive physical and one reactive relational item (excluded due to poor reliability), resulting in an aggressive normative beliefs total score that tended to be reliable (Cronbach's $\alpha = .69$). Caution should be exercised when interpreting findings using the NBSAS. Example items are presented in the Appendix and the full measure is available upon request from the second author.

Procedure

Participants provided informed written consent and completed the questionnaires in a small group format via paper and pencil. Instructions were read aloud by the research assistant. Questionnaire administration typically lasted no more than 30–40 min. Participants were fully debriefed at the conclusion of the study.

Results

Bivariate correlations were conducted in order to assess for inter-correlations of the subscales. To test for gender differences a MANOVA was conducted with aggressive behaviors serving as the dependent variables. Four regression models were run to test for the unique effects between the four aggression models and the four outcomes (i.e., impulsivity, HAB for instrumental provocation situations, HAB for relational provocation situations, and normative beliefs of aggression). In each model gender was controlled and the interaction between aggression subtypes and gender was explored.

Descriptive Statistics

Descriptive statistics (i.e., mean, SD, and range) were calculated for the four subtypes of aggression, impulsivity, hostile attribution bias subscales (i.e., instrumental and relational) and normative beliefs measure (see Table 1). Measures of skew (-.24 to 2.02) and kurtosis (-.58 to 4.53) suggested no concerns about non-normality of the data (Kline 1998).

Inter-Correlations and Zero-order Correlations

In keeping with past studies that rely on self-report instruments, proactive and reactive physical aggression were highly correlated. In addition, proactive and reactive relational aggression were highly correlated. Proactive relational and physical aggression were moderately to highly correlated. Reactive relational and physical aggression were moderately correlated. In full support of hypotheses, only reactive physical aggression was significantly associated with HAB for instrumental provocation situations and only reactive relational aggression was significantly associated with HAB for relational provocation situations (see Table 2). Importantly, the magnitude of these correlations was generally small, accounting for limited amount of variance, and thus replication is needed.

Table 1 Descriptive statistics

Measure	<i>M</i>	<i>SD</i>	Range
Proactive Ragg	9.04	3.96	5.0–25.0
Reactive Ragg	14.59	5.41	6.0–36.0
Proactive Pagg	4.74	2.39	3.0–16.0
Reactive Pagg	5.56	3.27	3.0–18.0
Impulsivity	63.78	10.21	41.0–93.0
Instrumental HAB	9.52	1.68	8.0–14.0
Relational HAB	12.75	1.78	8.0–16.0
Aggressive Norm	8.68	2.35	6.0–19.0

Note: Ragg, relational aggression; Pagg, physical aggression; Impulsivity, impulsivity total; HAB, hostile attribution bias; Norm, normative beliefs

All aggression subtypes were associated with impulsivity and with the normative beliefs measure.

Hypothesis 1: Gender differences

To investigate gender differences in self-reported aggression, a MANOVA was conducted. The independent factor was gender and the four aggression scores (proactive physical, reactive physical, proactive relational, and reactive relational) served as the dependent variables. A significant multivariate main effect of gender was found for proactive physical aggression, $F(1, 163) = 23.10, p = .001, \eta_p^2 = .12$, such that men ($M = 5.58; SD = 2.91$) self-reported higher levels of proactive physical aggression than women ($M = 3.90; SD = 1.30$). A significant multivariate main effect of gender was also found for reactive physical aggression, $F(1, 163) = 23.32, p = .001, \eta_p^2 = .13$, revealing that men ($M = 6.72; SD = 3.60$) self-reported higher levels of reactive physical aggression than women ($M = 4.41; SD = 2.43$). No other significant effects were found. The first hypothesis was partially supported in that men reported more proactive and reactive physical aggression than

women. Women were not more relationally aggressive than men for either function type.

Hypothesis 2: Unique associations between aggression subtypes and impulsivity

A regression model (model 1) was conducted in which impulsivity served as the dependent variable. Gender and the four aggression subtypes (proactive relational aggression, reactive relational aggression, proactive physical aggression, and reactive physical aggression) were entered simultaneously. Contrary to predictions, none of the aggression types were significant predictors of impulsivity, controlling for the other types and gender (see Table 3). Interactions with gender (not shown for ease of communication) were not significant.

Hypothesis 3: Unique associations between aggression subtypes and hostile attribution biases

A regression model (model 2) was conducted in which hostile attribution biases for instrumental provocation situations served as the outcome variable. The overall model was not significant. Given the a priori prediction that reactive physical aggression would be uniquely associated with HAB instrumental, we examined the beta weights for significant effects. Interestingly, controlling for gender and all other aggression subtypes, only reactive physical aggression was a significant predictor. Since the overall model did not account for a significant amount of variance, we interpret this effect with extreme caution and await replication. Model 3 was conducted in the same manner with HAB for relational provocation situations serving as the outcome variable. In keeping with the predictions, the overall model was significant and it was revealed that only reactive relational aggression and gender (i.e., women were higher) were significant predictors, controlling for all other aggression subtypes. Interactions with gender (not shown for ease of communication) were not significant.

Table 2 Zero-order correlations

Composite	1.	2.	3.	4.	5.	6.	7.	8.
1. Pro Ragg	–	.71**	.64**	.43**	.28**	.14	.04	.46**
2. Rea Ragg		–	.45**	.44**	.28**	.14	.19*	.36**
3. Pro Pagg			–	.72**	.19*	.08	–.00	.38**
4. Rea Pagg				–	.17*	.18*	–.03	.40**
5. Impulsivity					–	.01	–.08	.26**
6. Inst HAB						–	.33**	.14
7. Relat HAB							–	–.03
8. Aggression Norm								–

Note: Pro, proactive; Rea, reactive; Ragg, relational aggression; Pagg, physical aggression; Impulsivity, impulsivity total; Inst, instrumental; Relat, relational; HAB, hostile attribution bias; Norm, normative beliefs. * $p < .05$; ** $p < .01$

Table 3 Forms and functions of aggression as a predictor of concurrent impulsivity, hostile attribution biases and normative beliefs

Outcome, predictors	<i>B</i>	<i>SE</i>	β	<i>F</i>	<i>R</i> ²
Model 1: Impulsivity				(5, 155) = 3.48, <i>p</i> = .005	.10
Gender	−2.06	1.72	−.10		
Proactive Ragg	.42	.33	.17		
Reactive Ragg	.34	.21	.18		
Proactive Pagg	−.27	.57	−.06		
Reactive Pagg	.09	.36	.03		
Model 2: HAB INST				(5, 159) = 1.84, <i>p</i> = .11	.06
Gender	.23	.29	.07		
Proactive Ragg	.06	.06	.14		
Reactive Ragg	.002	.04	.01		
Proactive Pagg	−.13	.10	−.18		
Reactive Pagg	.14	.06	.27*		
Model 3: HAB REL				(5, 159) = 4.17, <i>p</i> = .001	.12
Gender	.86	.29	.24**		
Proactive Ragg	−.09	.06	−.20		
Reactive Ragg	.11	.04	.32**		
Proactive Pagg	.10	.10	.13		
Reactive Pagg	−.05	.06	−.09		
Model 4: Norm beliefs				(5, 158) = 12.41, <i>p</i> < .001	.28
Gender	−.80	.35	−.17*		
Proactive Ragg	.22	.07	.37***		
Reactive Ragg	.02	.04	.04		
Proactive Pagg	−.09	.12	.12		
Reactive Pagg	.16	.07	.22*		

Note: Ragg, relational aggression; Pagg, physical aggression; HAB, hostile attribution biases; INST, instrumental provocation scenarios; REL, relational provocation scenarios; NORM, normative beliefs. **p* < .05; ***p* < .01; ****p* < .001

Hypothesis 4: Unique associations between aggression subtypes and normative beliefs

A final regression model (model 4) was conducted in which normative beliefs served as the outcome variable. All four aggression subtypes and gender were entered simultaneously and the model was significant. This exploratory model revealed that gender (i.e., men were higher), proactive relational aggression and reactive physical aggression were unique significant predictors of normative beliefs of aggression, controlling for all other subtypes of aggression. Interactions with gender (not shown for ease of communication) were not significant.

Discussion

The present study had four major objectives to extend past literature on the forms and functions of aggression. The first objective was to investigate gender differences among the specific subtypes of aggressive behaviors. The second purpose was to test for unique associations between forms

and functions of aggression and impulsivity. The third purpose was to test the relations between forms and functions of aggression and types of hostile attribution biases (i.e. instrumental and relational provocation scenarios). The fourth goal was to examine a unique relation between specific subtypes of aggression and normative beliefs about aggression.

Gender differences for physical aggression were demonstrated (Hypothesis 1). In particular, as predicted, men report significantly higher levels for both proactive and reactive functions of physical aggression, as compared to women. These findings are consistent with previous studies with children (Ostrov and Crick 2007) and extend the previous adult literature by investigating the specific functions of physical aggression (Buss and Perry 1992). Although the current study found specific gender differences for functions of physical aggression, contrary to predictions, there were no significant gender differences for functions of relational aggression. The findings are in keeping with a past emerging adult study by Linder et al. (2002) in which gender differences for relational

aggression were not discovered. Further research is needed with emerging adults to replicate these effects. It is conceivable that as men learn more about relational aggression during adolescence and they learn that these relatively more covert behaviors have less social costs, compared to physical aggression, they start to engage in these behaviors more frequently during this developmental period (see Bjorkqvist 1994). Future research is needed to test if relational aggression is more developmentally salient for women even if gender differences are not detectable during the emerging adult period (Werner and Crick 1999). That is, does relational aggression predict more social-psychological problems for women relative to men during emerging adulthood?

The inter-correlations of self-reported aggression subtypes were consistent with past research, which has found moderate levels of overlap between physical and relational aggression (e.g., Crick and Grotpeter 1995) and high levels of inter-correlation between reactive and proactive aggression (e.g., Dodge and Coie 1987). Furthermore, all aggression subtypes were significantly correlated with impulsivity. Thus, in contrast to predictions, the regression model did not reveal any unique effects for aggression subtypes and specifically for reactive function types (Hypothesis 2). Prior research on impulsivity has focused primarily upon reactive aggression in its physical form (Harmon-Jones et al. 1996; Stanford et al. 1995); the present findings provide limited support for past research that found impulsive regulation deficits among emerging adults with high levels of relational aggression (Werner and Crick 1999). This indicates a need for further research involving the relational form of reactive aggression. Future research may also benefit from exploring associations between subtypes of impulsive behavior and subtypes of aggression. For example, reactive relational aggression may be more highly associated with attentional impulsivity than with motor impulsiveness, which may be more closely associated with reactive physical aggression.

In terms of intent attributions (Hypothesis 3), correlational analyses provided further evidence of a differential association between the aggression subtypes. Specifically, reactive physical aggression was the only aggression construct to be significantly correlated with instrumental provocation situations and reactive relational aggression was correlated only with relational provocation scenarios. In keeping with the hypothesis, the regression models served as a more robust examination of this association and documented a unique association between reactive relational aggression and hostile attribution biases for relational provocation situations. The omnibus effect was not present for the instrumental HAB model, but the regression weight for reactive physical aggression suggested the possibility for a unique amount of variance

explained, which was in keeping with a priori predictions. These findings support some of the past literature on forms of aggression (i.e., physical and relational aggression) with children and adolescents (Crick 1995; Crick and Dodge 1996; Crick et al. 2002; Nelson and Crick 1999) and are in contrast to other recent studies (Crain et al. 2005). It seems that ecologically valid measures of hostile attribution biases for instrumental and relational provocation scenarios may be useful in differentiating between the forms and functions of aggression.

Findings testing the fourth goal of the study revealed an association between all aggression subtypes and normative beliefs. However, regression analyses indicated a unique role for proactive relational aggression and for reactive physical aggression. Since the measure was a composite of various types of aggression the interpretation of these effects is difficult and we call for additional future research with more psychometrically sound instruments. Past literature has supported the idea that relationally aggressive behavior is correlated with normative beliefs about relational aggression; whereas, physically aggressive behavior is correlated with normative beliefs about physical aggression (e.g., Huesmann and Guerra 1997; Werner and Nixon 2005). Future research involving children and adolescents is thus needed to further test these important questions.

Several limitations were present in the current study, which should be addressed in future research. First, due to the use of self-report measures, there is a risk for demand characteristics and social desirability biases. In addition, since all measures were self-report instruments there is the possibility that there are shared-method variance concerns. Future research including peer nomination instruments and other informants of aggression types is needed to replicate current findings. Second, the present sample was limited to only students enrolled in an Introductory to Psychology course; therefore, the college sample may not be representative of all emerging adults or of processes at other developmental periods. However, most of the findings replicate prior studies involving children and adolescents (e.g., Crick and Dodge 1996). Finally, the present study is only correlational and determination of causality may not be obtained. A multi-method, multi-informant prospective longitudinal study is needed to confirm and extend these findings.

Implications

The current study underscores the need for the development of intervention and prevention efforts targeting functions as well as forms of aggressive behavior across development (see Ostrov and Godleski 2007). In addition,

hostile attribution biases may be a key point of intervention that if modified might significantly reduce aggressive behavior (Leff et al. 2007). The current study adds to the extant literature that has found a specific link between subtypes of aggression and hostile attribution biases for specific provocation situations (Crick 1995; Crick et al. 2002; cf. Crain et al. 2005) by focusing on the function of the aggressive behavior as well. Therefore, for example, to decrease reactive relational aggression an intervention program that addresses the social cognitions associated with these behaviors (e.g., HAB for relational provocations) may be effective (Leff et al. 2007). To inform future treatment initiatives, we call for further interdisciplinary research to better understand how social, biological and cognitive domains interact in the development and course of forms and functions of aggression.

Conclusion

Overall, this study provides evidence of the importance of both the forms and functions of aggressive behavior. It seems that hostile attribution biases are important for understanding the reactive functions of aggressive behavior in emerging adults. Specifically, reactive relational aggression was uniquely associated with hostile attribution biases for relational provocation situations and reactive physical aggression tended to be uniquely associated with hostile attribution biases for instrumental scenarios. In conclusion, understanding the existing mechanisms, which differentiate the forms and functions of aggression is vital for future research in assessment and prevention across development.

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Appendix A

Examples from the Normative Beliefs of Subtypes of Aggression Scale (NBSAS)

Directions: The following questions ask you about whether you think certain behaviors are WRONG or are OK. Using the scale below, write the answer that best

describes what you think. Write the appropriate number in the blank provided. Please choose only ONE answer for each question.

IT'S REALLY WRONG	IT'S SORT OF WRONG	IT'S SORT OF OK	IT'S REALLY OK
1	2	3	4

7. ____ John spreads rumors (e.g., gossip) about a peer to maintain his social status (*Proactive relational aggression*)

8. ____ John pushes a peer in response to being threatened by that peer (*Reactive physical aggression*)

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