

Metadata of the article that will be visualized in OnlineFirst

1	Article Title	Exploring the Cognitive and Emotional Correlates to Proactive and Reactive Aggression in a Sample of Detained Girls
2	Journal Name	Journal of Abnormal Child Psychology
3		Family Name Marsee
4		Particle
5		Given Name Monica A.
6	Corresponding	Suffix
7	Author	Organization University of New Orleans
8		Division Department of Psychology
9		Address 2001 Geology and Psychology Bldg, New Orleans 70148, LA, USA
10		e-mail monica.marsee@usm.edu
11		Family Name Frick
12		Particle
13		Given Name Paul J.
14		Suffix
15	Author	Organization University of New Orleans
16		Division Department of Psychology
17		Address 2001 Geology and Psychology Bldg, New Orleans 70148, LA, USA
18		e-mail pfrick@uno.edu
19		Received 14 September 2006
20	Schedule	Revised
21		Accepted 9 May 2007
22	Abstract	The current study examined the distinction between reactive and proactive aggression in a sample of detained girls ($N=58$) ages 12 to 18. This study employed a self-report measure of aggression that was designed explicitly to assess both the forms that aggression takes (i.e., relational and overt), as well as the functions that aggression serves (i.e., reactive and proactive). Reactive aggression was uniquely associated with poorly regulated emotion and anger to perceived provocation, whereas proactive aggression was uniquely associated with callous-unemotional (CU) traits and biased outcome expectations for aggression. While overt aggression appeared to largely account for these associations, relational aggression showed strong and unique associations with CU traits. The current findings highlight the importance of assessing reactive and proactive aggression, as well as both overt and relational aggression, in detained girls.
23	Keywords separated by ' - '	Proactive aggression - Reactive aggression - Relational aggression - Delinquency - Girls
24	Foot note information	

1 J Abnorm Child Psychol
2 DOI 10.1007/s10802-007-9147-y

4 Exploring the Cognitive and Emotional Correlates 5 to Proactive and Reactive Aggression in a Sample 6 of Detained Girls

7 Monica A. Marsee · Paul J. Frick

8 Received: 14 September 2006 / Accepted: 9 May 2007
9 © Springer Science + Business Media, LLC 2007

12 **Abstract** The current study examined the distinction
13 between reactive and proactive aggression in a sample of
14 detained girls ($N=58$) ages 12 to 18. This study employed a
15 self-report measure of aggression that was designed explic-
16 itly to assess both the forms that aggression takes (i.e.,
17 relational and overt), as well as the functions that aggression
18 serves (i.e., reactive and proactive). Reactive aggression was
19 uniquely associated with poorly regulated emotion and
20 anger to perceived provocation, whereas proactive aggres-
21 sion was uniquely associated with callous–unemotional
22 (CU) traits and biased outcome expectations for aggression.
23 While overt aggression appeared to largely account for these
24 associations, relational aggression showed strong and
25 unique associations with CU traits. The current findings
26 highlight the importance of assessing reactive and proactive
27 aggression, as well as both overt and relational aggression,
28 in detained girls.

29 **Keywords** Proactive aggression · Reactive aggression ·
30 Relational aggression · Delinquency · Girls

31 Aggression is generally defined as behaviors that are intended
32 to hurt or harm others (e.g., Berkowitz 1993). It has become
33 increasingly clear that there are several different types of
34 aggressive behavior that can be displayed by children and
35 adolescents. One distinction frequently examined in research
36 is between reactive and proactive aggression (Dodge and
37 Coie 1987; Dodge 1991). Reactive aggression is generally

defined as aggression that occurs as an angry response to a
perceived provocation or threat (e.g., Berkowitz 1993),
whereas proactive aggression is conceptualized as aggres-
sion that is unprovoked and is used for instrumental gain or
dominance over others (Dodge 1991; Dodge and Coie
1987). In support of this distinction, separate factors have
been obtained using teacher (Day et al. 1992; Dodge and
Coie 1987), parent (Poulin and Boivin 2000a), and peer
ratings of aggression (Salmivalli and Nieminen 2002).
However, these two types of aggression are frequently
moderately to substantially correlated in samples of youth
(r s ranging from approximately 0.40 to 0.90) suggesting that
some children display both types of aggressive behavior and
leading some to question the utility of this distinction
(Bushman and Anderson 2001; Walters 2005).

Clearly, theories of aggression that distinguish between
reactive and proactive aggression must explain their
frequent co-occurrence in the same individual (Frick and
Marsee 2006). However, these theories also need to explain
the consistent findings of distinct correlates to the two types
of aggression (see Poulin and Boivin 2000b). Consistent
differences in the correlates of reactive and proactive
aggression have been seen in both cognitive and emotional
domains. Specifically, reactive but not proactive aggression
has been consistently linked to a tendency to misinterpret
ambiguous behaviors as hostile provocation (Crick and
Dodge 1996; Day et al. 1992; Dodge and Coie 1987;
Dodge et al. 1990; Hubbard et al. 2001). In contrast,
proactive but not reactive aggression has been associated
with the tendency to view aggression as an effective means
to reach goals that is unlikely to result in punishment (Crick
and Dodge 1996; Dodge et al. 1997; Schwartz et al. 1998).
In terms of emotional correlates, reactive aggression has
been associated with low frustration tolerance and poorly
regulated responses to emotional stimuli (Vitaro et al.

M. A. Marsee (✉) · P. J. Frick
Department of Psychology, University of New Orleans,
2001 Geology and Psychology Bldg,
New Orleans, LA 70148, USA
e-mail: monica.marsee@usm.edu

P. J. Frick
e-mail: pflick@uno.edu

2002), while proactive aggression has been associated with reduced levels of emotional reactivity (i.e., skin conductance and heart rate acceleration; Hubbard et al. 2002) and with callous and unemotional (CU) personality traits, which are defined as a failure to show prosocial emotions such as empathy or guilt (Frick et al. 2003; Kruh et al. 2005).

These cognitive and emotional differences provide one piece of evidence supporting the distinction between reactive and proactive aggression. However, one limitation of this research is that most studies have focused on male samples. A few notable exceptions using mixed-gender samples suggest that the findings may generalize to girls. For example, Crick and Dodge (1996) found that both boys and girls who were classified as reactively aggressive using teacher ratings were more likely to exhibit a hostile attributional bias than children classified as proactively aggressive. Further, they found that proactively aggressive boys and girls were more likely than reactively aggressive children to evaluate aggressive behavior in a positive way and to expect positive outcomes for their aggressive behavior. Similarly, two studies reported that reactively aggressive boys and girls exhibited more anger and anxiety than proactively aggressive children (Hubbard et al. 2002; Vitaro et al. 2002). Thus, available research suggests that the correlates to reactive and proactive aggression are similar for boys and girls. This conclusion, however, is based on a limited number of studies.

In extending this literature to girls, it is also important to consider another distinction that has been made within aggressive behaviors. Several studies have shown that when girls behave aggressively, they are more likely to choose relational aggression¹ (rather than physical or overt aggression) as a strategy for use within the peer group (Crick 1996; Crick et al. 1997; Crick and Grotpeter 1995; Lagerspetz et al. 2004). Overt and relational forms of aggression can be descriptively distinguished by their method of harm and the goals they serve (Crick and Grotpeter 1995). Overt aggression (also referred to as “physical aggression” in some studies) harms others by damaging their physical well-being and includes physically and verbally aggressive behaviors such as hitting, pushing, kicking, and threatening

(Coie and Dodge 1988; Parke and Slaby 1983). In contrast, relational aggression harms others by damaging social relationships, friendships, or feelings of inclusion and acceptance in the peer group (Crick et al. 1999). Relational aggression consists of behaviors such as gossiping about others, excluding target children from a group, spreading rumors, or telling others not to be friends with a target child (Crick and Grotpeter 1995; Lagerspetz et al. 1988).

Overt and relational aggression show moderate correlations in past research, ranging from approximately 0.50 to 0.70 in both normative and clinical samples (e.g., Crick 1996; Moretti et al. 2001). Despite these correlations, factor analyses of teacher (Crick 1996; Rys and Bear 1997), self (Prinstein et al. 2001), and peer ratings (Crick and Grotpeter 1995) provide some support for the distinctiveness of relational and overt aggression. Further, many studies have found that relational aggression predicts social-psychological maladjustment above and beyond overt aggression, especially for girls (e.g., Crick 1996; Crick and Grotpeter 1995; Prinstein et al. 2001).

With a few notable exceptions, past research on relational aggression has generally not considered whether youth use this type of aggression both reactively and proactively. However, in recent years researchers have begun to examine this hypothesis in samples of children and adolescents (e.g., Little et al. 2003; Prinstein and Cillessen 2003). In a unique and sophisticated examination of aggressive behavior in German youth (grades 5 through 10), Little et al. (2003) developed a measurement system that allowed them to disentangle the overriding forms of aggression (i.e., overt and relational), from the underlying functions (i.e., reactive and proactive) using structural equation modeling. While this study did not test hypotheses related to the cross-products of the four dimensions (e.g., reactive relational, proactive relational, reactive overt, and proactive overt), it did provide evidence for the existence of these subtypes and the ability to validly measure them in youth. Subsequent research examining these four dimensions has indicated that they are internally consistent and show differential associations with internalizing disorder symptoms (Marsee et al., submitted for publication; Marsee et al., manuscript in preparation) and peer status (Prinstein and Cillessen 2003). However, past research has not tested the question of whether, similar to past findings for overt or physical aggression, these four dimensions show differences in their cognitive and emotional correlates.

The purpose of the current study is to expand on past research in two important ways. First, this study includes cognitive (e.g., hostile attributional bias; outcome expectations for aggressive behavior) and emotional (e.g., callous–unemotional traits; anger to provocation) characteristics that have not been examined in previous research, but that may be uniquely associated with reactive and proactive

¹While Crick and colleagues use the term “relational” aggression, other researchers have used different terminology to refer to this type of behavior (i.e., “indirect” aggression; Lagerspetz et al. 1988 and “social” aggression; Cairns et al. 1989; Galen and Underwood 1997). These three labels have often been used interchangeably in the literature, with some researchers claiming that “the same phenomenon is referred to by these three concepts” (Björkqvist 2001, p.272; see also Underwood et al. 2001). While the three types are measured in somewhat different ways, they are virtually indistinguishable in terms of their basic characteristics and goals, in that they all focus on harming others through social manipulation strategies. Therefore, in order to maintain parsimony, the current investigation uses the term relational aggression to refer to this type of behavior.

167 forms of relational aggression. Second, the current study
 168 examined the distinctions between both reactive and
 169 proactive aggression and overt and relational aggression
 170 in a sample of detained adolescent girls. This sample was
 171 chosen due to the high rates of aggressive behavior in
 172 detained girls, as well as the lack of appropriate gender-
 173 based treatments for problem behavior among girls
 174 involved in the juvenile justice system (Chamberlain and
 175 Moore 2002). Distinguishing among subtypes of aggression
 176 in such high-risk samples could be especially important for
 177 designing interventions for incarcerated girls based on the
 178 cognitive and emotional processes that may be leading to or
 179 maintaining their problem behaviors (Frick 2006).

180 Based on past research, we hypothesized that reactive
 181 and proactive aggression (used both overtly and relationally)
 182 would show differential correlates in a sample of detained
 183 girls. Specifically, we hypothesized that reactive aggression
 184 would be associated with poorly regulated emotions (i.e.,
 185 emotional dysregulation), anger to perceived provocation,
 186 and a hostile attributional bias, while proactive aggression
 187 would be associated with callous unemotional (CU) traits,
 188 positive outcome expectations for aggression, and low
 189 punishment expectations for aggression. In this study, we
 190 examined both anger as a response to perceived provocation
 191 as well as poorly regulated emotional behaviors in general
 192 (i.e., inappropriate displays of negative emotions), but did
 193 not determine whether poorly regulated emotional behavior
 194 was due to high levels of physiological reactivity, deficient
 195 strategies to regulate this reactivity, or both. We chose to
 196 focus on the behavioral outcome as past research has
 197 consistently linked such behaviors to reactive aggression
 198 but has not conclusively determined which processes lead to
 199 these unregulated behaviors (Frick and Morris 2004). Given
 200 the expected correlation between reactive and proactive
 201 aggression, we tested both the overall association and the
 202 unique variance associated with these cognitive and emo-
 203 tional characteristics and each type of aggression. Further,
 204 given that (a) relational and overt aggression are frequently
 205 correlated (Crick 1996; Moretti et al. 2001), and (b) a
 206 detained sample is likely to have higher rates of overt
 207 aggression than a community sample, we also tested
 208 whether relational aggression was associated with theoret-
 209 ically important cognitive and emotional characteristics
 210 independently of the presence of overt aggression.

211 **Method**

212 **Participants**

213 The parents or legal guardians of 82 pre-adjudicated
 214 adolescent girls housed in three short-term detention
 215 facilities in southeastern Louisiana were contacted by

detention center staff and asked for permission for the 216
 researcher to contact them for potential participation. The 217
 participating detention facilities were locally operated and 218
 primarily housed pre-adjudicated youth awaiting trial. 219
 Approximately half (52%) of the participants were recruited 220
 from a facility in a large urban area of southeastern 221
 Louisiana, while the other half were recruited from two 222
 facilities serving surrounding suburban and rural areas. One 223
 youth was excluded based on parental report of an educa- 224
 tional exceptionality of mild mental retardation and one 225
 youth was excluded based on parental refusal to consent. The 226
 parents/guardians of seven youth could not be contacted for 227
 consent purposes and 13 youth were released from detention 228
 before parental consent could be obtained. Data from two 229
 additional girls were excluded because of outlying scores 230
 (i.e., greater than three SD from the mean) on the aggression 231
 measures. The overall participation rate in this study was 232
 comparable to other self-report studies with detained 233
 adolescent females (e.g., Holsinger and Holsinger 2005). 234

235 The final sample consisted of 58 adolescent girls
 236 ranging in age from 12 to 18 ($M=14.98$; $SD=1.30$). The
 237 self-reported ethnic breakdown of the sample was 78%
 238 African-American and 22% Caucasian, which is largely
 239 representative of girls housed in detention centers across the
 240 state (Louisiana Youth Services Office of Youth Develop-
 241 ment 2004). Based on a review of their institutional records,
 242 the majority of participants had at least one prior detention
 243 (79%) with an average age of 14.21 ($SD=1.34$) at first
 244 detention. In terms of offense history, 35% of the girls had
 245 committed at least one violent offense, most commonly
 246 assault/battery (33%). The majority of the girls had past
 247 arrests for nonviolent offenses such as public order offenses
 248 (59%), status offenses (22%), and theft (21%).

249 **Measures**

250 *Peer Conflict Scale (PCS; Marsee et al. 2004)* The PCS
 251 was developed based on items from existing rating scales
 252 assessing reactive, proactive, overt, and relational aggres-
 253 sion (Brown et al. 1996; Björkqvist et al. 1992; Crick and
 254 Grotperter 1995; Dodge and Coie 1987; Galen and
 255 Underwood 1997). The PCS was created to overcome
 256 certain limitations of past aggression measures, including
 257 narrowly worded items (e.g., proactive items assessing only
 258 aggression for gain but not for dominance or sadistic
 259 reasons) and items not directly assessing harm to a victim.
 260 All items were reworded to ensure that there was direct
 261 correspondence between overt and relational items, such
 262 that for each reactive overt item there was an analogous
 263 reactive relational item, and for each proactive overt item
 264 there was an analogous proactive relational item. This
 265 process led to the creation of a self-report measure
 266 including ten items in each of four aggression categories:

267 proactive overt (“I start fights to get what I want”),
268 proactive relational (“I gossip about others to become
269 popular”), reactive overt (“When someone hurts me, I end
270 up getting into a fight”), and reactive relational (“If others
271 make me mad, I tell their secrets”). Items are rated on a four-
272 point scale (0=“not at all true,” 1=“somewhat true,” 2=
273 “very true,” and 3=“definitely true”) and scores are
274 calculated by summing the ten items separately for the four
275 subscales (range=0–30 for each subscale). Scores for overall
276 overt and relational aggression can also be calculated by
277 summing the 20 items that comprise their respective
278 subscales (range=0–60).

279 Examination of the factor structure of the PCS in at-risk
280 adolescents showed that a correlated four-factor model
281 adequately fit the data for both boys and girls (Marsee et
282 al., submitted for publication; Marsee et al., manuscript in
283 preparation). Both relational and overt aggression scores on
284 the PCS were significantly correlated with self-reported
285 delinquency in a sample of adolescent boys and girls
286 enrolled in an intervention program designed for youth who
287 have dropped out of school (Barry et al. 2007). Further, in a
288 sample of detained adolescent boys, reactive overt aggres-
289 sion scores on the PCS were associated with increased
290 aggressive responding to low levels of provocation in a
291 laboratory measure of aggression and with greater auto-
292 nomic reactivity during provocation (Muñoz et al. 2007).
293 Internal consistency for the PCS scales in this study was
294 satisfactory: total overt=0.90; reactive overt=0.87; overt=
295 0.82; total relational=0.87; reactive relational=0.80; pro-
296 active relational=0.76.

297 *Inventory of Callous-Unemotional Traits* (ICU; Frick
298 2004). The ICU is a 24-item self-report scale designed to
299 assess callous and unemotional traits in youth. The ICU was
300 derived from the six-item callous-unemotional (CU) subscale
301 of the Antisocial Process Screening Device (APSD; Frick and
302 Hare 2001). The CU component of the APSD has emerged
303 as a distinct factor in clinic and community samples of
304 preadolescent boys and girls (Frick et al. 2000) and detained
305 samples of adolescent boys and girls (Vitacco et al. 2003). It
306 has been associated with more severe aggression and more
307 proactive patterns of aggression and violence in detained
308 male adolescents (Kruh et al. 2005). However, the self-
309 reported CU scale has demonstrated only moderate internal
310 consistency in many past studies (e.g., Loney et al. 2003),
311 which is likely due to its small number of items ($n=6$) and
312 three-point rating system. Also, five out of the six items are
313 worded in the same direction, increasing the possibility of
314 response bias.

315 The ICU was developed to overcome these limitations
316 and to provide a more extended assessment of CU traits. It
317 was constructed using the four items (out of the original
318 six) that loaded significantly on the CU scale in both clinic-

referred and community samples (Frick et al. 2000). For 319
each item (“I am concerned about the feelings of others,” “I 320
feel bad or guilty when I do something wrong,” “I care 321
about how well I do at school or work,” and “I do not show 322
my emotions to others”), three positively and three 323
negatively worded variations were developed (including 324
the original item in its exact wording), and these 24 items 325
were placed on a four-point scale (0=“not at all true,” 1= 326
“somewhat true,” 2=“very true,” and 3=“definitely true”). 327
Scores are calculated by reverse-scoring the positively 328
worded items and then summing the items to obtain a total 329
score. The validity of this expanded self-report measure of 330
CU traits was supported in a large community sample of 331
adolescent boys and girls in which the ICU showed 332
significant correlations with severity of antisocial behavior, 333
impairment, and sensation-seeking (Essau et al. 2006). 334
Internal consistency of the ICU in the current sample of 335
detained girls was satisfactory ($\alpha=0.79$). 336

Abbreviated Dysregulation Inventory (ADI; Mezzich et al. 337
2001) The Abbreviated Dysregulation Inventory (ADI) is 338
a 30-item self-report measure designed to assess three 339
aspects of dysregulation (emotional/affective, behavioral, 340
and cognitive) in adolescents. The emotional/affective 341
dysregulation subscale consists of ten items that measure 342
poorly regulated emotional behavior (e.g., “I have trouble 343
controlling my temper”). This was the only subscale used 344
in the current study. Each item on the ADI is rated on a 345
four-point scale from 0 (never true) to 3 (always true). The 346
ADI is a shortened version of the original dysregulation 347
inventory (DI) and was formed using item response theory 348
to include only those items with the highest discriminant 349
coefficients (A. C. Mezzich, personal communication, July 350
19, 2004). Both the full DI (Mezzich et al. 2001) and the 351
ADI (Pardini et al. 2003) have shown significant correla- 352
tions with established measures of emotional and behav- 353
ioral distress in adolescent boys and girls. The ADI 354
emotional/affective dysregulation subscale showed ade- 355
quate internal consistency in this sample ($\alpha=0.75$) 356

Adolescent Stories (Conduct Problems Prevention Research 357
Group 1999) The Adolescent Stories interview assesses 358
male and female adolescents’ attributional tendencies in 359
response to ambiguous provocation. The version of 360
Adolescent Stories used in the present study was modified 361
to assess hostile intent attributions to both overt and 362
relational provocation situations. The current measure 363
consists of eight hypothetical stories in which youth find 364
themselves targets of ambiguous provocation by a peer. 365
Four of the vignettes describe overt provocation (e.g., 366
books knocked on the floor by another student), and four 367
describe relational provocation (e.g., not being invited to a 368
party). Youth are asked to rate the likelihood that the an- 369

370 tagonist in the vignette had hostile intent (on a five-point
371 scale, from “not at all likely” to “very likely”), and also to
372 rate how angry they would feel in the situation (on a five-
373 point scale, from “not at all” to “very angry”). Scores for
374 Adolescent Stories are calculated by summing items
375 across stories in order to form hostile attribution and
376 anger to provocation subscales. Internal consistency for
377 these scales in the current study was moderate ($\alpha=0.77$
378 and 0.68 for hostile attribution and anger to provocation
379 scales, respectively).

380 *Outcome Expectations Questionnaire (OEQ; Pardini et al.*
381 *2003)* This version of the Outcome Expectations Question-
382 naire (OEQ; Perry et al. 1986) consists of eight brief
383 vignettes designed to measure adolescents’ expectations
384 that aggressive behavior against a same-sex peer will result
385 in various outcomes. In the vignettes, participants are asked
386 to imagine using overtly or relationally aggressive behavior
387 to either obtain a tangible reward from a peer (e.g., phy-
388 sically threatening a peer to get something from her) or
389 retaliate against aversive treatment from a peer (e.g.,
390 writing a mean note about a peer because she has been
391 gossiping about you). Four of the vignettes depict overtly
392 aggressive situations and four vignettes depict relationally
393 aggressive situations. The relational aggression vignettes
394 were modeled after those used in Goldstein and Tisak
395 (2004).

396 After reading each vignette, participants are asked to rate
397 the likelihood that various outcomes will occur on a four-
398 point scale, with 1 indicating that the participant is “very
399 sure” that the outcome *will not* occur, 2 indicating that the
400 participant is “pretty sure” that the outcome *will not* occur,
401 3 indicating that the participant is “pretty sure” that the
402 outcome *will* occur, and 4 indicating that the participant is
403 “very sure” that the outcome *will* occur. For each vignette,
404 participants are asked to rate the likelihood that they will
405 successfully obtain the desired object/reduce aversive
406 treatment (depending on the goal depicted in the vignette),
407 be punished for their actions, and gain a sense of
408 dominance over their peer. Similar scales have been shown
409 to successfully differentiate between aggressive/nonag-
410 gressive and antisocial/control boys and girls (Hall et al.
411 1998; Perry et al. 1986). Further, delinquent boys and girls
412 with CU traits exhibited a tendency to overestimate the
413 rewarding aspects and underestimate the punishing aspects
414 of aggression using this measure (Pardini et al. 2003). For
415 the purposes of the current study, only the positive outcome
416 expectation and punishment expectation scales were used.
417 Scores were calculated by summing the items for these two
418 subscales. Internal consistency for these scales was adequate
419 ($\alpha=0.65$ and 0.80 for positive outcome expectation and
420 punishment expectation, respectively).

Procedure 421

422 Prior to the initiation of the study, all procedures were
423 approved by the university Institutional Review Board
424 (IRB), which included a prisoner representative from a
425 statewide juvenile justice initiative. Prior to data collection,
426 a telephone informed consent procedure was conducted
427 with the parents of potential participants. Parents were
428 contacted by telephone, provided a description of the study,
429 and read an informed consent form. The consent form
430 included information regarding the procedures of the study,
431 the voluntary nature of participation, risks and benefits
432 associated with study participation, and the terms of
433 confidentiality. Parents were then asked whether they
434 agreed to allow their child to participate in the study. Upon
435 agreement, the researcher asked parents if they would allow
436 their consent to be audiotaped. All parents agreed and a
437 tape recording device was connected to the telephone to
438 record verbal parental consent. Following verbal consent
439 procedures, hard copies of all consent forms were mailed to
440 parents.

441 Procedures for youth assent were implemented individ-
442 ually with each youth. The researcher read an assent form
443 (written at a seventh grade reading level) to potential
444 participants describing the basic procedures of the study,
445 the voluntary nature of participation, risks and benefits
446 associated with the study, and the terms of confidentiality.
447 Youth were informed that refusal to participate would not
448 result in any disciplinary action at the detention facility.
449 They were also informed that the information they
450 provided would be used for research purposes only and
451 that no detention staff would have access to the informa-
452 tion. Finally, potential participants were allowed to ask
453 questions about the study before agreeing to participate.
454 After obtaining parental consent and youth assent, the
455 principal investigator administered the questionnaires to
456 participants during small group sessions (three to eight
457 participants per group). All questionnaires were read to all
458 participants in order to control for potential reading level
459 differences. Additionally, at least one trained undergradu-
460 ate research assistant was present during data collection.
461 Assistants were trained to answer any questions that the
462 participants had, to ensure that participants understood the
463 questionnaires and were not skipping ahead, and to ensure
464 that participants did not look around at others’ papers
465 during the session. Upon completion of data collection,
466 participants were rewarded with a pizza party.

Results 467

468 Table 1 reports the means, standard deviations, and internal
469 consistency for the main study variables. As found in past

470 research (e.g., Brown et al. 1996; Dodge and Coie 1987;
 471 Vitaro et al. 2002), levels of self-reported reactive aggression
 472 in this sample were much higher than levels of
 473 proactive aggression, although this was somewhat more
 474 evident for overt ($t(57)=-15.20, p<0.001$) than relational
 475 aggression ($t(57)=-6.83, p<0.001$). Neither age ($r_s=-0.10$
 476 to 0.07) nor ethnicity ($r_s=-0.09$ to -0.06) was significantly
 477 correlated with any of the aggression scales. Ethnicity
 478 (coded as 1=Caucasian and 2=African-American) was
 479 associated with the hostile attribution bias ($r=-0.31, p<$
 480 0.05) and anger to provocation ($r=-0.32, p<0.05$) scales
 481 from the Adolescent Stories measure, indicating that
 482 Caucasian participants attributed greater hostile intent (t
 483 $(56)=2.41, p<0.05$) and endorsed stronger angry reactions
 484 ($t(56)=2.52, p<0.05$) to the provocations described in this
 485 measure. Ethnicity was also associated with punishment
 486 expectation ($r=0.30, p<0.05$), indicating that African-
 487 American participants endorsed a greater tendency to expect
 488 punishment for their aggressive actions ($t(56)=-2.31,$
 489 $p<0.05$). Also, the aggression subscales from the PCS were
 490 significantly intercorrelated. The overt and relational sub-
 491 scales were correlated $r=0.73, r=0.56,$ and $r=0.76$ (all $p<$
 492 0.001) for the total, reactive, and proactive scales, respec-
 493 tively. The reactive and proactive scales were correlated $r=$
 494 0.65 ($p<0.001$) for both overt and relational aggression.

495 Correlations between the subscales of the PCS and the
 496 cognitive and emotional variables are provided in Table 2.
 497 Consistent with past research, overt aggression was

498 significantly associated with five of the six cognitive and
 499 affective variables. The only variable that was not signifi-
 500 cantly associated with self-report of overt aggression was
 501 the hostile attributional bias score from the Adolescent
 502 Stories measure ($r=0.11, p=n.s.$). Also, consistent with
 503 predictions, only the reactive overt aggression scale was
 504 significantly associated with the emotional dysregulation
 505 subscale of the ADI ($r=0.42, p<0.01$), and only the pro-
 506 active overt aggression scale was associated with positive
 507 outcome expectation scale of the OEQ ($r=0.31, p<0.05$).
 508 The results were similar but less strong for the relational
 509 aggression subscales. Relational aggression was signifi-
 510 cantly associated with three of the six emotional/cognitive
 511 variables. Further, for the three variables that did reach
 512 significance, there was no evidence for differential associ-
 513 ations between reactive and proactive aggression on the
 514 relational aggression subscales (see Table 2).

515 Due to the significant correlation between the reactive
 516 and proactive subscales of the PCS, differential correlations
 517 with the cognitive and affective variables of interest may
 518 have been obscured. To examine the separate associations
 519 between the aggression and cognitive/emotional variables,
 520 hierarchical regression analyses were conducted. The
 521 regression models were set up to assess the unique variance
 522 in the cognitive and affective variables associated with each
 523 of the aggression subscales. In order to examine unique
 524 variance, the aggression variables were entered as separate
 525 predictor variables in the regression equations. Since the

t1.1 **Table 1** Means, standard deviations, and internal consistency of main study variables

t1.2 Variable	Mean (SD)			Min-max	Alpha
t1.3	Total	CA	AA		
t1.4 Aggression					
t1.5 OVT	18.61 (10.38)	19.92 (11.03)	18.23 (10.29)	1-44	0.90
t1.6 REA	14.66 (7.05)	15.54 (7.91)	14.41 (6.86)	1-27	0.87
t1.7 PRO	3.95 (4.31)	4.38 (3.84)	3.82 (4.47)	0-17	0.82
t1.8 REL	11.97 (8.44)	13.23 (9.70)	11.60 (8.13)	0-32	0.87
t1.9 REA	7.78 (5.14)	8.38 (6.10)	7.60 (4.89)	0-22	0.80
t1.10 PRO	4.19 (4.15)	4.85 (4.24)	4.00 (4.16)	0-18	0.76
t1.11 Emotional/cognitive					
t1.12 ED	18.62 (5.68)	19.54 (6.10)	18.36 (5.59)	7-30	0.75
t1.13 ANG	27.60 (4.99)	30.54 (3.82) ^a	26.76 (5.00) ^a	16-38	0.68
t1.14 HAB	26.09 (6.64)	29.85 (3.78) ^b	25.00 (6.92) ^b	8-36	0.77
t1.15 CU	23.50 (9.17)	26.85 (7.81)	22.53 (9.38)	5-45	0.79
t1.16 PEX	21.47 (4.92)	22.56 (4.05)	21.15 (5.14)	8-30	0.65
t1.17 PUN	19.12 (5.03)	16.38 (4.07) ^c	19.91 (5.04) ^c	8-30	0.80

Q2 t1.18 $N=58$; CA Caucasian ($n=13$); AA African-American ($n=45$); OVT overt; REL relational; REA reactive; PRO proactive; ED emotional dysregulation; ANG anger to provocation; HAB hostile attributional bias; CU callous-unemotional traits; PEX positive expectation for aggression; PUN punishment expectation for aggression. Means sharing like superscripts are significantly different at $p<0.05$ using a t test for independent samples ($df=56$).

t2.1 **Table 2** Correlations between aggression and emotional/cognitive variables

t2.2 Variable	TR	RR	PR	TO	RO	PO
t2.3 Emotional dysregulation	0.20	0.24	0.12	0.32*	0.42**	0.09
t2.4 Anger to provocation	0.44**	0.42**	0.37**	0.47***	0.46***	0.37**
t2.5 Hostile attributional bias	0.08	0.06	0.09	0.11	0.14	0.03
t2.6 CU traits	0.47***	0.39**	0.48***	0.34*	0.26*	0.38**
t2.7 Positive expectation	0.20	0.15	0.23	0.26*	0.20	0.31*
t2.8 Punishment expectation	-0.48***	-0.44**	-0.43**	-0.47***	-0.41**	-0.47***

t2.9 *TR* Total relational, *RR* reactive relational, *PR* proactive relational, *TO* total overt, *RO* reactive overt, *PO* proactive overt, *CU* callous–unemotional
 * $p < 0.05$
 ** $p < 0.01$
 *** $p < 0.001$

526 predictor variables were highly correlated, the degree of explained by other independent variables, whereas VIF 531
 527 multicollinearity among the variables was examined for all indicates whether the proportion of variability in an 532
 528 regression analyses by calculating variance inflation factor independent variable has been exaggerated due to multi- 533
 529 (VIF) and tolerance values. Tolerance represents the collinearity (Allison 1999). In general, these values did not 534
 530 proportion of variability in an independent variable not indicate problematic levels of multicollinearity, as all VIFs 535

t3.1 **Table 3** Hierarchical regression analyses examining unique associations of reactive aggression with measures of emotional dysregulation, anger, and attributional bias

t3.2 Aggression variable	Emotional/cognitive variables								
	ED			ANG			HAB		
	<i>B</i>	SE <i>B</i>	β	<i>B</i>	SE <i>B</i>	β	<i>B</i>	SE <i>B</i>	β
t3.5 Model 1									
t3.6 Step 1: RR	0.27	0.14	0.24	0.41	0.12	0.42**	0.08	0.17	0.06
t3.7 R^2			0.06			0.18**			0.00
t3.8 Model 2									
t3.9 Step 1: RR	0.32	0.19	0.29 ^a	0.31	0.15	0.32*	-0.00	0.23	-0.00
t3.10 Step 2: PR	-0.10	0.23	-0.07 ^a	0.20	0.19	0.17	0.15	0.28	0.10
t3.11 R^2			0.06			0.19			0.01
t3.12 Model 3									
t3.13 Step 1: RR	0.01	0.16	0.01 ^b	0.24	0.14	0.24	-0.03	0.21	-0.02
t3.14 Step 2: RO	0.34	0.12	0.42** ^b	0.23	10.32*	0.14	0.15	0.15	
t3.15 R^2			0.18**			0.25*			0.02
t3.16 Model 4									
t3.17 Step 1: RO	0.34	0.10	0.42**	0.32	0.08	0.46***	0.13	0.13	0.14
t3.18 R^2			0.18**			0.21***			0.02
t3.19 Model 5									
t3.20 Step 1: RO	0.51	0.12	0.64*** ^c	0.26	11.37* ^d	.19	.17	.20	
t3.21 Step 2: PO	-0.43	0.20	-0.33* ^c	0.15	0.18	0.13 ^d	-0.14	0.27	-0.09
t3.22 R^2			0.24*			0.22			0.02

Q3 t3.23 Betas sharing like superscripts are significantly different.
ED Emotional dysregulation, *ANG* anger to provocation, *HAB* hostile attributional bias, *RR* reactive relational, *PR* proactive relational, *RO* reactive overt, *PO* proactive overt
^a $t(55)=2.68$ at $p < 0.01$
^b $t(55)=3.76$ at $p < 0.001$
^c $t(55)=3.62$ at $p < 0.001$
^d $t(55)=2.32$ at $p < 0.05$
 * $p < 0.05$
 ** $p < 0.01$
 *** $p < 0.001$

were less than 2.50 and all tolerance values were greater than 0.40, which are considered acceptable values (Allison 1999). A power analysis (calculated using GPOWER; Erdfelder et al. 1996) for a sample of 58 ($\alpha=0.05$) indicated that the power to detect a medium effect for these analyses was over 0.70.

Table 3 reports results for five hierarchical regression models examining the unique variance associated with reactive aggression. Each model represents a distinct analysis in which the aggression variables were entered at separate steps to test their unique associations with the cognitive/affective variables of interest. For example, in model 1 reactive relational aggression was entered by itself, and in model 2 proactive relational aggression was added to model 1's equation at a separate step to examine its ability

to account for variance in the cognitive/affective variables over and above that accounted for by reactive relational aggression. The results reported in Table 3 generally support the predicted divergent associations among the emotional/cognitive variables and reactive aggression. That is, reactive relational aggression but not proactive relational aggression accounted for unique variance in anger to provocation ($\beta=0.32, p<0.05$) and reactive but not proactive overt aggression accounted for unique variance in the emotional dysregulation ($\beta=0.64, p<0.001$) and anger to provocation ($\beta=0.37, p<0.05$) variables.

To further examine the differences in the relative strength of the unique associations between reactive and proactive forms of aggression and the variables of interest, difference scores between the standardized regression

Table 4 Hierarchical regression analyses examining unique associations of proactive aggression with callous–unemotional traits and outcome expectancies

Aggression variable	Emotional/cognitive variables								
	CU			PEX			PUN		
	B	SE B	β	B	SE B	β	B	SE B	β
Model 1									
Step 1: PR	1.06	0.26	0.48***	0.27	0.15	0.23	-0.52	0.15	-0.43**
R ²			0.23***		0.05			0.18**	
Model 2									
Step 1: PR	0.86	0.34	0.39* ^a	0.26	0.20	0.22 ^b	-0.31	0.19	-0.25
Step 2: RR	0.25	0.28	0.14 ^a	0.01	0.17	0.01 ^b	-0.27	0.15	-0.27
R ²			0.24		0.05			0.23	
Model 3									
Step 1: PR	0.98	0.40	0.44* ^c	-0.04	0.23	-0.03 ^d	-0.19	0.22	-0.16 ^e
Step 2: PO	0.10	0.39	0.05 ^c	0.39	0.23	0.34 ^d	-0.41	0.21	-0.35 ^e
R ²			0.23		0.10			0.24	
Model 4									
Step 1: PO	0.82	0.26	0.38**	0.36	0.15	0.31*	-0.55	0.14	-0.47***
R ²			0.15**		0.10*			0.22***	
Model 5									
Step 1: PO	0.79	0.35	0.37* ^f	0.37	0.19	0.32 ^g	-0.42	0.18	-0.36*
Step 2: RO	0.03	0.21	0.02 ^f	-0.01	0.12	-0.01 ^g	-0.12	0.11	-0.17
R ²			0.15		0.10			0.24	

Betas sharing like superscripts are significantly different. CU Callous–unemotional traits, PEX positive expectation for aggression, PUN punishment expectation for aggression, RR reactive relational, PR proactive relational; RO reactive overt, PO proactive overt

^a $t(55)=2.44$ at $p<0.05$
^b $t(55)=1.94$ at $p<0.05$
^c $t(55)=5.30$ at $p<0.001$
^d $t(55)=4.78$ at $p<0.001$
^e $t(55)=2.20$ at $p<0.05$
^f $t(55)=3.52$ at $p<0.001$
^g $t(55)=3.02$ at $p<0.01$
 * $p<0.05$
 ** $p<0.01$
 *** $p<0.001$

566 coefficients were calculated using the test for differences in
 567 dependent correlations (Bruning and Kintz 1997). The
 568 standardized Betas for reactive relational aggression were
 569 significantly stronger in predicting emotional dysregulation
 570 ($t(55)=2.68, p<.01$) than the standardized coefficients for
 571 proactive aggression. Further, the standardized coefficients
 572 for reactive overt aggression were significantly stronger for
 573 predicting emotional dysregulation ($t(55)=3.62, p<.001$)
 574 and anger to provocation ($t(55)=2.32, p<.05$) than the
 575 standardized coefficients for proactive aggression. These
 576 differences were all in the predicted directions.

577 Similar analyses are reported in Table 4 for the variables
 578 predicted to be more strongly associated with proactive
 579 aggression. As predicted, proactive relational aggression
 580 accounted for unique variance in CU traits after controlling
 581 for reactive relational aggression ($\beta=0.39, p<0.05$). Fur-
 582 ther, proactive overt aggression accounted for unique
 583 variance in CU traits ($\beta=0.37, p<0.05$) and punishment
 584 expectation ($\beta=-0.36, p<0.05$) when controlling for
 585 reactive overt aggression. Also, the standardized beta for
 586 proactive overt aggression in the prediction of positive
 587 outcome expectancies for aggression ($\beta=0.32, p=0.06$)
 588 approached significance. In comparing the regression
 589 coefficients for proactive and reactive relational aggression
 590 in the prediction of CU traits ($t(55)=2.44, p<0.05$) and
 591 positive outcome expectancies for aggression ($t(55)=1.94,$
 592 $p<0.05$), the coefficients differed significantly and were in
 593 the predicted direction, with proactive relational aggression
 594 showing stronger associations than reactive relational
 595 aggression with these variables. Similarly, the coefficients
 596 for proactive overt aggression and reactive overt aggression
 597 in the prediction of CU traits ($t(55)=3.52, p<0.001$) and
 598 positive outcome expectation for aggression ($t(55)=3.02, p<$
 599 0.01) were significantly different from each other and in the
 600 expected direction.

601 Also reported in Tables 3 and 4 (model 3) are results
 602 from hierarchical regression equations testing the unique
 603 variance accounted for in the cognitive/affective variables
 604 by relational and overt forms of aggression. These analyses
 605 generally indicated that overt aggression accounted for a
 606 greater degree of the unique variance in the measures than
 607 relational aggression, although in many cases there was
 608 evidence for substantial shared variance. The one exception
 609 to this finding was evident in the analysis using proactive
 610 aggression as a predictor of the measure of CU traits (see
 611 Table 4, model 3). In this analysis, proactive relational
 612 aggression accounted for a significant amount of unique
 613 variance in CU traits after controlling for proactive overt
 614 aggression ($\beta=0.44, p<0.05$), whereas proactive overt
 615 aggression only accounted for a minimal amount of unique
 616 variance after controlling for proactive relational aggression
 617 ($\beta=0.05, p=n.s.$). In further support of this finding, the
 618 regression coefficients for proactive relational and proactive

overt aggression in the prediction of CU traits were 619
 significantly different ($t(55)=5.30, p<0.001$), with proac- 620
 tive relational aggression showing a stronger association 621
 than proactive overt aggression with the measure of CU 622
 traits². 623

Discussion 624

The results of the current study support past research 625
 suggesting that reactive and proactive aggression are 626
 associated with distinct cognitive and emotional character- 627
 istics (Day et al. 1992; Little et al. 2003; Vitaro et al. 2002). 628
 The current findings expand on this research by examining 629
 these differential correlates in a sample of detained girls. 630
 Similar to past research with boys and community samples 631
 of girls, reactive overt aggression was uniquely associated 632
 with measures of poorly regulated emotion (emotional 633
 dysregulation) and anger to perceived provocation when 634
 controlling for proactive overt aggression. Further, proac- 635
 tive overt aggression was more strongly associated with 636
 positive outcome expectations than reactive overt aggres- 637
 sion, and was uniquely associated with CU traits and lower 638
 expectations for punishment when controlling for reactive 639
 overt aggression. These results suggest that distinguishing 640
 between reactive and proactive aggression may be as 641
 important for understanding aggression in girls as it is in 642
 boys (see Frick and Marsee 2006, for a review). 643

644 One finding in the current study that was notably
 645 inconsistent with past research was the lack of association
 646 between a hostile attributional bias and aggression. This
 647 finding may be due to our small sample size which may
 648 have limited our ability to detect significant associations.
 649 Still, this finding is somewhat surprising given the
 650 abundance of research suggesting that aggression in
 651 general, and reactive aggression specifically, is often

²In addition to the analyses conducted using reactive and proactive aggression as continuous variables, we also conducted analyses using these variables categorically in order to group participants based on their aggression scores (median split). ANOVAs were used to determine whether group differences existed and Tukey HSD tests were conducted to compare pairs of group means. Although small *n*'s in the high reactive/low proactive groups ($n=8$ for both overt and relational scales) and the high proactive/low reactive groups ($n=5$ for both overt and relational scales) may have prevented the finding of differences for these groups, the overall pattern of results was consistent with the continuous analyses. Specifically, participants in the high reactive/high proactive groups ($n=20$ for overt scales; $n=21$ for relational scales) scored significantly higher on both anger to provocation and CU traits than those in the low reactive/low proactive groups ($n=25$ for overt scales; $n=24$ for relational scales). Further participants in the low reactive/low proactive groups scored significantly higher on the punishment expectation scale than those in the high reactive/high proactive groups, suggesting that those with lower levels of aggression expected more punishment for their actions.

652 associated with the tendency to interpret ambiguous
653 provocations as intentionally hostile (Day et al. 1992;
654 Dodge and Coie 1987; Hubbard et al. 2001). However, with
655 some exceptions (e.g., MacBrayer et al. 2003), these
656 findings have largely been found in samples of boys, with
657 results for girls being much less consistent (Frick et al.
658 2003). One possible reason for this inconsistency may be
659 that the hostile attributional bias in girls is dependent on the
660 type of provocation situation they experience. That is,
661 aggressive girls may only exhibit a hostile attributional bias
662 for situations depicting relational provocation because girls
663 find these situations more distressing than boys (Crick et al.
664 2002). However, in post-hoc analyses dividing the provo-
665 cation scenarios used in our analyses into those with either
666 relational or overt provocations, hostile attributions were
667 still not significantly associated with any of the measures of
668 reactive aggression ($r_s=0.05-0.17$). Thus, more research is
669 needed to better understand potential gender differences in
670 the association between hostile attributional biases and
671 aggression.

672 Our results suggest that reactive and proactive relational
673 aggression may show some of the same divergent correlates
674 as reactive and proactive overt aggression. Specifically,
675 reactive relational aggression was more strongly associated
676 with poorly regulated emotion and anger to perceived
677 provocation, whereas proactive relational aggression was
678 more strongly associated with CU traits and positive
679 outcome expectations for aggression. These results support
680 the contention that relational aggression, despite not
681 involving physical harm to a victim, captures a similar
682 construct as overt aggression- potentially in a way that is
683 more applicable to how girls harm others (Crick and
684 Grotpeter 1995). However, it is important to note that in
685 our detained sample, relational aggression did not consis-
686 tently account for unique variance in the cognitive and
687 emotional variables when controlling for overt aggression,
688 as it has in many past studies of non-detained girls (e.g.,
689 Crick 1996; Crick and Grotpeter 1995; Prinstein et al.
690 2001). These discrepant findings may be due to our small
691 sample size, or may be a result of the use of a sample with
692 much higher rates of overt aggression than would typically
693 be found in non-detained samples of girls. Thus, the current
694 sample may have consisted of fewer girls who exhibit
695 relational aggression without overt aggression.

696 Interestingly, the one variable with which relational
697 aggression showed a stronger unique association than overt
698 aggression was CU traits, and this was the case for
699 proactive relational aggression only. This finding is con-
700 sistent with past research suggesting that CU traits seem to
701 be uniquely associated with a severe pattern of aggression
702 involving proactively aggressive behaviors (Frick et al.
703 2003; Kruh et al. 2005). This finding is also consistent with
704 past research documenting the importance of CU traits for

705 understanding serious delinquent and/or aggressive behav-
706 ior in girls (Chamberlain and Moore 2002; Frick et al.
707 2003; Marsee et al. 2005; Moretti et al. 2001; Silverthorn
708 and Frick 1999). The link between relational aggression
709 and CU traits is especially important due to the finding that
710 the presence of CU traits seems to designate a distinct
711 developmental pathway to serious conduct problems that is
712 associated with a temperamental style characterized by
713 reduced emotional reactivity to the distress of others (Frick
714 2006; Frick and Morris 2004). The fact that proactive
715 relational aggression, as opposed to proactive overt aggres-
716 sion, accounted for the most unique variance in this
717 theoretically important personality dimension further sup-
718 ports the importance of relational aggression in studying the
719 development of aggressive tendencies in girls.

720 It is important to note that the divergent correlations
721 found in the current study between reactive and proactive
722 aggression and emotional/cognitive variables were largely
723 found when controlling for the overlap between the two
724 types of aggression. This finding is consistent with a
725 number of past studies (Day et al. 1992; Dodge and Coie
726 1987; Dodge et al. 1997; Little et al. 2003; Vitaro et al.
727 2002), and provides support for the idea that these
728 differential correlates need to be interpreted in light of the
729 high degree of association between proactive and reactive
730 aggression (Bushman and Anderson 2001; Walters 2005).
731 A related issue to consider when interpreting the divergent
732 emotional/cognitive correlates found in this study is the
733 finding that there may be some asymmetry in the high
734 degree of association between the two types of aggression.
735 Specifically, past research suggests that a significant
736 number of children exhibit only reactive forms of aggres-
737 sion, whereas most children who exhibit high levels of
738 proactive aggression also show high rates of reactive
739 aggression (Brown et al. 1996; Dodge and Coie 1987;
740 Frick et al. 2003; Pitts 1997). Further, research suggests that
741 children who use both reactive and proactive of aggression,
742 rather than showing characteristics associated with both,
743 seem to show cognitive and emotional characteristics
744 associated with proactive aggression (Hubbard et al. 2002;
745 Pardini et al. 2003; Pitts 1997). Thus, due to the different
746 pattern of correlates found in youth who use both types, the
747 unique emotional and cognitive correlates to reactive
748 aggression may only become apparent when controlling
749 for proactive aggression.

750 Results from the current study need to be interpreted in
751 light of several limitations. First, the cross-sectional nature
752 of the data makes it impossible to make any type of causal
753 interpretations regarding the associations between the
754 cognitive and emotional variables and aggression. For
755 example, while it is certainly possible that expectations of
756 positive outcomes for aggressive behavior may increase the
757 likelihood that a child will act aggressively, it is also

758 possible that a child who is aggressive and receives positive
 759 gains from this behavior could develop such positive
 760 expectancies over time. Second, all of the variables measured
 761 in this study were assessed through self-report. Thus, all
 762 measures solely assess participants' self-perceptions, which
 763 could be susceptible to reporter biases. For example, the
 764 vignette procedure used to assess positive outcome expectan-
 765 cies only measures participants' perceptions of how aggres-
 766 sion works in social situations but does not assess whether
 767 these perceptions are accurate. In addition to increased
 768 susceptibility to reporter biases, the reliance on self-report
 769 measures may have artificially inflated associations among
 770 variables due to shared method variance. However, the effects
 771 of shared method variance could not explain the differences in
 772 correlations across the two types of aggression, both of which
 773 were measured by self-report.

774 A third limitation to the current study was our small
 775 sample size, which may have affected the power to detect
 776 significant associations among variables. Although a-priori
 777 considerations of sample size as well as post-hoc power
 778 analyses indicated that our sample size was adequate to
 779 detect medium effects (Cohen 1988), the small size of the
 780 sample may have prevented us from detecting certain
 781 expected associations, such as that between reactive
 782 aggression and hostile attributional bias. Also, the small
 783 sample size prevented us from testing potentially important
 784 interactions, such as interactions between reactive and
 785 proactive aggression or the possible moderating role of
 786 ethnicity. Fourth, our focus solely on detained adolescent
 787 girls, while justified by the paucity of research on separate
 788 dimensions of aggression in this population, limits the
 789 generalizability of our results to boys, community youth,
 790 and/or youth in different age groups. Further, although the
 791 ethnic breakdown of our sample was representative of
 792 detained girls in the region of the participating detention
 793 centers, it was primarily composed of African-American
 794 youth, which may further influence the generalizability of
 795 the results.

796 Within the context of these limitations, the current
 797 results support the need to consider relational aggression
 798 in understanding serious delinquent and aggressive behav-
 799 ior in girls and, as with overt aggression, to consider
 800 reactive and proactive dimensions when studying cognitive
 801 and emotional correlates to aggression. While we have
 802 focused primarily on the theoretical implications of these
 803 findings, they could also have important clinical implica-
 804 tions as well. It is possible that reactive and proactive
 805 relational aggression represent distinct pathways to problem
 806 behavior, pathways which may require drastically different
 807 treatment approaches (Frick and Morris 2004). For exam-
 808 ple, interventions for youth who use reactive aggression
 809 often focus on developing better emotion regulation skills,
 810 and may consist of strategies such as helping youth control

aggressive responses when angry (Larson and Lochman 811
 2003). In contrast, youth who use proactive aggression may 812
 require a different treatment focus that addresses either their 813
 perceptions of the usefulness of aggression for obtaining 814
 social goals and/or their deficits in empathic concern 815
 towards others (Frick 2001, 2006). Children who use both 816
 types of aggression typically show cognitive and emotional 817
 correlates consistent with children who only use proactive 818
 aggression (Hubbard et al. 2002; Pardini et al. 2003; Pitts 819
 1997), and therefore might benefit most from the latter type 820
 of intervention. However, given that the current study did 821
 not focus on distinct groups of aggressive youth, this 822
 assumption was not tested. 823

824 For both reactive and proactive treatment approaches,
 825 however, most past interventions have focused largely on
 826 reducing overt aggression. The results of the current study
 827 support past research in suggesting that these programs
 828 need to be broadened to target relational forms of aggres-
 829 sion, especially when intervening with detained or incar-
 830 ceterated girls (Chamberlain and Moore 2002; Moretti et al.
 831 2001; Van Schoiack-Edstrom et al. 2002). A focus on
 832 relational aggression may allow for more prevention-
 833 centered efforts, given findings that relational aggression
 834 may precede more serious delinquent and aggressive
 835 behavior in girls (Moretti and Odgers 2002). Thus, attention
 836 to relational aggression as well as reactive, proactive, and
 837 overt forms of aggression may be important in the design
 838 and implementation of individualized approaches to treat-
 839 ment that consider both emotional and cognitive differ-
 840 ences, as well as gender differences, in the manifestation of
 841 aggressive behavior.

Acknowledgment This research is based on the doctoral dissertation 843
 of the first author and was supported in part by an APA Dissertation 844
 Research Award. Portions of this research were presented at the 2007 845
 Biennial meeting of the Society for Research in Child Development in 846
 Boston, MA. The authors would like to thank those who contributed 847
 to this project, with special thanks given to the directors and staff of 848
 the Youth Study Center in New Orleans, LA, the Terrebonne Parish 849
 Juvenile Detention Center in Houma, LA, and the St. James Youth 850
 Center in St. James, LA. 851

References 852

Allison, P. D. (1999). *Logistic regression using the SAS system—* 853
Theory and application. Cary, NC: SAS Institute, Inc. 854
 Barry, C. T., Grafeman, S. J., Adler, K. K., & Pickard, J. D. (2007). The 855
 relations among narcissism, self-esteem, and delinquency in a 856
 sample of at-risk adolescents. *Journal of Adolescence* (in press). 857
 Berkowitz, L. (1993). *Aggression: Its causes, consequences, and* 858
control. New York: Academic. 859
 Björkqvist, K. (2001). Comments to 'Top ten challenges for 860
 understanding gender and aggression in children: Why can't we 861

862 all just get along?' Different names same issue. *Social Develop-*
 863 *ment, 10, 272–274.*

864 Björkqvist, K., Lagerspetz, K. M. J., & Österman, K. (1992). *The*
 865 *direct and indirect aggression scales.* Vasa, Finland: Abo
 866 Akademi University, Department of Social Sciences.

867 Brown, K., Atkins, M. S., Osborne, M. L., & Milnamow, M. (1996).
 868 A revised teacher rating scale for reactive and proactive
 869 aggression. *Journal of Abnormal Child Psychology, 24,*
 870 *473–479.*

871 Bruning, J. L., & Kintz, B. L. (1997). *Computational handbook of*
 872 *statistics* (4th ed.). New York: Addison-Wesley.

873 Bushman, B. J., & Anderson, C. A. (2001). Is it time to pull the plug
 874 on hostile versus instrumental aggression dichotomy? *Psycholo-*
 875 *gical Review, 108, 273–279.*

876 Cairns, R. B., Cairns, B. D., Neckerman, H. J., Ferguson, L. L., &
 877 Garipey, J. L. (1989). Growth and aggression: 1. Childhood to
 878 early adolescence. *Developmental Psychology, 25, 320–330.*

879 Chamberlain, P., & Moore, K. J. (2002). Chaos and trauma in the
 880 lives of adolescent females with antisocial behavior and
 881 delinquency. *Journal of Aggression, Maltreatment, and Trauma,*
 882 *6, 79–108.*

883 Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*
 884 (2nd ed.). Hillsdale, NJ: Erlbaum.

885 Coie, J. D., & Dodge, K. A. (1998). Aggression and antisocial
 886 behavior. In W. Damon & N. Eisenberg (Eds.), *Handbook of*
 887 *child psychology: Social, emotional, and personality development*
 888 (pp. 779–862). Toronto: Wiley.

889 Conduct Problems Prevention Research Group (1999). *Adolescent*
 890 *stories.* Retrieved from <http://www.fasttrackproject.org/>.

891 Crick, N. R. (1996). The role of overt aggression, relational
 892 aggression, and prosocial behavior in the prediction of children's
 893 future social adjustment. *Child Development, 67, 2317–2327.*

894 Crick, N. R., & Grotpeter, J. K. (1995). Relational aggression, gender,
 895 and social-psychological adjustment. *Child Development, 66,*
 896 *710–722.*

897 Crick, N. R., & Dodge, K. A. (1996). Social information-processing
 898 mechanisms in reactive and proactive aggression. *Child Develop-*
 899 *ment, 67, 993–1002.*

900 Crick, N. R., Casas, J. F., & Mosher, M. (1997). Relational and overt
 901 aggression in preschool. *Developmental Psychology, 33, 579–588.*

902 Crick, N. R., Werner, N. E., Casas, J. F., O'Brien, K. M., Nelson,
 903 D. A., Grotpeter, J. K., et al. (1999). Childhood aggression and
 904 gender: A new look at an old problem. In D. Bernstein (Ed.), *The*
 905 *45th Nebraska symposium on motivation: Gender and motivation*
 906 (pp. 75–141). Lincoln, NE: Nebraska University Press.

907 Crick, N. R., Grotpeter, J. K., & Bigbee, M. A. (2002). Relationally
 908 and physically aggressive children's intent attributions and
 909 feelings of distress for relational and instrumental peer provoca-
 910 tions. *Child Development, 73, 1134–1142.*

911 Day, D. M., Bream, L. A., & Pal, A. (1992). Proactive and reactive
 912 aggression: An analysis of subtypes based on teacher percep-
 913 tions. *Journal of Clinical Child Psychology, 21, 210–217.*

914 Dodge, K. A. (1991). Emotion and social information processing. In J.
 915 Garber & K. A. Dodge (Eds.), *The development of emotion*
 916 *regulation and dysregulation* (pp. 159–181). New York: Cam-
 917 bridge University Press.

918 Dodge, K. A., & Coie, J. D. (1987). Social-information-processing
 919 factors in reactive and proactive aggression in children's peer
 920 groups. *Journal of Personality and Social Psychology, 53,*
 921 *1146–1158.*

922 Dodge, K. A., Price, J. M., Bachorowski, J., & Newman, J. P. (1990).
 923 Hostile attributional biases in severely aggressive adolescents.
 924 *Journal of Abnormal Psychology, 99, 385–392.*

925 Erdfelder, E., Faul, F., & Buchner, A. (1996). GPOWER: A general
 926 power analysis program. *Behavior Research Methods, Instru-*
 927 *ments, and Computers, 28, 1–11.*

Essau, C. A., Sasagawa, S., & Frick, P. J. (2006). Callous-unemotional
 928 traits in a community sample of adolescents. *Assessment, 13,*
 929 *454–469.*

Frick, P. J. (2001). Effective interventions for children and adolescents
 930 with conduct disorder. *The Canadian Journal of Psychiatry, 46,*
 931 *26–37.*

Frick, P. J. (2004). *Inventory of callous-unemotional traits.* Unpub-
 932 lished rating scale, University of New Orleans.

Frick, P. J. (2006). Developmental pathways to conduct disorder.
 933 *Child Psychiatric Clinics of North America, 15, 311–332.*

Frick, P. J., & Hare, R. D. (2001). *Antisocial process screening device:*
 934 *Technical manual.* New York: Multi-Health Systems, Inc.

Frick, P. J., & Morris, A. S. (2004). Temperament and developmental
 935 pathways to conduct problems. *Journal of Clinical Child and*
 936 *Adolescent Psychology, 33, 54–68.*

Frick, P. J., & Marsee, M. A. (2006). Psychopathy and developmental
 937 pathways to antisocial behavior in youth. In C. J. Patrick (Ed.),
 938 *Handbook of Psychopathy* (pp. 353–374). New York: Guilford.

Frick, P. J., Bodin, S. D., & Barry, C. T. (2000). Psychopathic traits
 939 and conduct problems in community and clinic-referred samples
 940 of children: Further development of the psychopathy screening
 941 device. *Psychological Assessment, 12, 382–393.*

Frick, P. J., Cornell, A. H., Barry, C. T., Bodin, S. D., & Dane, H. E.
 942 (2003). Callous-unemotional traits and conduct problems in the
 943 prediction of conduct problem severity, aggression, and self-
 944 report of delinquency. *Journal of Abnormal Child Psychology,*
 945 *31, 457–470.*

Galen, B. R., & Underwood, M. K. (1997). A developmental
 946 investigation of social aggression among children. *Developmen-*
 947 *tal Psychology, 33, 589–600.*

Goldstein, S. E., & Tisak, M. S. (2004). Adolescents' outcome
 948 expectancies about relational aggression within acquaintances-
 949 ships, friendships, and dating relationships. *Journal of Adoles-*
 950 *cence, 27, 283–302.*

Hall, J. A., Herzberger, S. D., & Skowronski, K. J. (1998). Outcome
 951 expectancies and outcome values as predictors of children's
 952 aggression. *Aggressive Behavior, 24, 439–454.*

Holsinger, K., & Holsinger, A. M. (2005). Differential pathways to
 953 violence and self-injurious behavior: African American and white
 954 girls in the juvenile justice system. *Journal of Research in Crime*
 955 *and Delinquency, 42, 211–242.*

Hubbard, J. A., Dodge, K. A., Cillessen, A. H. N., Coie, J. D., &
 956 Schwartz, D. (2001). The dyadic nature of social information
 957 processing in boys' reactive and proactive aggression. *Journal of*
 958 *Personality and Social Psychology, 80, 268–280.*

Hubbard, J. A., Smithmyer, C. M., Ramsden, S. R., Parker, E. H.,
 959 Flanagan, K. D., Dearing, K. F., et al. (2002). Observational,
 960 physiological, and self-report measures of children's anger:
 961 Relations to reactive versus proactive aggression. *Child Develop-*
 962 *ment, 73, 1101–1118.*

Kruh, I. P., Frick, P. J., & Clements, C. B. (2005). Historical and
 963 personality correlates to the violence patterns of juveniles tried as
 964 adults. *Criminal Justice and Behavior, 32, 69–96.*

Lagerspetz, K. M. J., Björkqvist, K., & Peltonen, T. (1988). Is indirect
 965 aggression typical of females? Gender differences in aggressive-
 966 ness in 11- to 12-year-old children. *Aggressive Behavior, 14,*
 967 *403–414.*

Larson, J., & Lochman, J. E. (2003). *Helping schoolchildren cope*
 968 *with anger.* New York: Guilford.

Little, T. D., Jones, S. M., Henrich, C. C., & Hawley, P. H. (2003).
 969 Disentangling the "whys" from the "whats" of aggressive
 970 behavior. *International Journal of Behavioral Development, 27,*
 971 *122–133.*

Loney, B. R., Frick, P. J., Clements, C. B., Ellis, M. L., & Kerlin, K.
 972 (2003). Callous-unemotional traits, impulsivity, and emotional
 973 processing in adolescents with antisocial behavior problems. 993

- 994 *Journal of Clinical Child and Adolescent Psychology*, 32,
995 66–80.
- 996 Louisiana Youth Services Office of Youth Development Fact Sheet
997 (2004). Retrieved from <http://www.oyd.louisiana.gov>.
- 998 MacBrayer, E. K., Milich, R., & Hundley, M. (2003). Attributional
999 biases in aggressive children and their mothers. *Journal of*
1000 *Abnormal Psychology*, 112, 698–708.
- 1001 Marsee, M. A., Kimonis, E. R., & Frick, P. J. (2004). *Peer conflict*
1002 *scale*. Unpublished rating scale, University of New Orleans.
- 1003 Marsee, M. A., Silverthorn, P., & Frick, P. J. (2005). The association
1004 of psychopathic traits with aggression and delinquency in non-
1005 referred boys and girls. *Behavioral Sciences and the Law*, 23,
1006 803–817.
- 1007 Mezzich, A. C., Tarter, R. E., Giancola, P. R., & Kirisci, L. (2001).
1008 The dysregulation inventory: A new scale to assess the risk for
1009 substance use disorder. *Journal of Child and Adolescent*
1010 *Substance Abuse*, 10, 35–43.
- 1011 Moretti, M., & Odgers, C. (2002). Aggressive and violent girls:
1012 Prevalence, profiles, and contributing factors. In R.R. Corrado
1013 et al. (Eds.), *Multi-problem violent youth* (pp.116–129). Canada:
1014 IOS Press.
- 1015 Moretti, M. M., Holland, R., & McKay, S. (2001). Self-other
1016 representations and relational and overt aggression in adolescent
1017 girls and boys. *Behavioral Sciences and the Law*, 19, 109–126.
- 1018 Muñoz, L. C., Frick, P. J., Kimonis, E. R., & Aucoin, K. J. (in press).
1019 Types of aggression, responsiveness to provocation, and callous-
1020 unemotional traits in detained adolescents (in press).
- Q4 1021 Ostrov, J. M., & Keating, C. F. (2004). Gender differences in
1022 preschool aggression during free play and structured interactions:
1023 An observational study. *Social Development*, 13, 255–275.
- 1024 Pardini, D. A., Lochman, J. E., & Frick, P. J. (2003). Callous/
1025 unemotional traits and social- cognitive processes in adjudicated
1026 youths. *Journal of the American Academy of Child and*
1027 *Adolescent Psychiatry*, 42, 364–371.
- 1028 Parke, R. D., & Slaby, R. G. (1983). The development of aggression. In
1029 P.H. Mussen (Series Ed.) and M. Hetherington (Vol. Ed.),
1030 *Handbook of child psychology, vol. 4. Socialization, personality,*
1031 *and social development* (4th ed.) (pp. 547–642). New York: Wiley.
- 1032 Perry, D. G., Perry, L. C., & Rasmussen, P. (1986). Cognitive social
1033 learning mediators of aggression. *Child Development*, 57,
1034 700–711.
- 1035 Pitts, T. B. (1997). Reduced heart rate levels in aggressive children. In
1036 A. Raine, P. A. Brennan, D. P. Farrington, & S. A. Mednick
1037 (Eds.), *Biosocial bases of violence* (pp. 317–320). New York:
1038 Plenum.
- Poulin, F., & Boivin, M. (2000a). Reactive and proactive aggression: 1039
Evidence of a two-factor model. *Psychological Assessment*, 12, 1040
115–122. 1041
- Poulin, F., & Boivin, M. (2000b). The role of proactive and reactive 1042
aggression in the formation and development of friendships in 1043
boys. *Developmental Psychology*, 36, 1–8. 1044
- Prinstein, M. J., & Cillessen, A. H. N. (2003). Forms and functions of 1045
adolescent peer aggression associated with high levels of peer 1046
status. *Merrill-Palmer Quarterly*, 49, 310–342. 1047
- Prinstein, M. J., Boergers, J., & Vernberg, E. M. (2001). Overt and 1048
relational aggression in adolescents: Social-psychological adjust- 1049
ment of aggressors and victims. *Journal of Clinical Child* 1050
Psychology, 30, 479–491. 1051
- Rys, G. S., & Bear, G. G. (1997). Relational aggression and peer 1052
relations: Gender and developmental issues. *Merrill-Palmer* 1053
Quarterly, 43, 87–106. 1054
- Salmivalli, C., & Nieminen, E. (2002). Proactive and reactive 1055
aggression among school bullies, victims, and bully-victims. 1056
Aggressive Behavior, 28, 30–44. 1057
- Schwartz, D., Dodge, K. A., Coie, J. D., Hubbard, J. A., Cillessen, 1058
A. H. N., Lemerise, E. A., et al. (1998). Social-cognitive and 1059
behavioral correlates of aggression and victimization in boys' 1060
play groups. *Journal of Abnormal Child Psychology*, 26, 1061
431–440. 1062
- Silverthorn, P., & Frick, P. J. (1999). Developmental pathways to 1063
antisocial behavior: The delayed-onset pathway in girls. *Devel-* 1064
opment and Psychopathology, 11, 101–126. 1065
- Underwood, M. K., Galen, B. R., & Paquette, J. A. (2001). Top ten 1066
challenges for understanding gender and aggression in chil- 1067
dren: Why can't we all just get along? *Social Development*, 10, 1068
248–266. 1069
- Van Schoiack-Edstrom, L., Frey, K. S., & Beland, K. (2002). 1070
Changing adolescents' attitudes about relational and physical 1071
aggression: An early evaluation of a school-based intervention. 1072
School Psychology Review, 31, 201–216. 1073
- Vitacco, M. J., Rogers, R., & Neumann, C. S. (2003). The antisocial 1074
process screening device: An examination of its construct and 1075
criterion-related validity. *Assessment*, 10, 143–150. 1076
- Vitaro, F., Brendgen, M., & Tremblay, R. E. (2002). Reactively and 1077
proactively aggressive children: Antecedent and subsequent 1078
characteristics. *Journal of Child Psychology and Psychiatry and* 1079
Allied Disciplines, 43, 495–506. 1080
- Walters, G. D. (2005). Proactive and reactive aggression: A lifestyle 1081
view. In J. P. Morgan (Ed.), *Psychology of aggression* (pp. 29–43). 1082
Hauppauge, NY: Nova. 1083

AUTHOR QUERIES

AUTHOR PLEASE ANSWER ALL QUERIES.

- Q1. Dodge et al. 1997; Lagerspetz et al. 2004 were cited in the body but was not listed in the references. Please check.
- Q2. Please indicate in the legend the significance of the footnote labels used in the table body.
- Q3. Please check the changes made in the legends.
- Q4. Ostrov and Keating 2004 was listed in the references but was not cited in the text. Please check

UNCORRECTED PROOF

UNCORRECTED PROOF