



# Hostile attribution bias and aggression in children and adolescents: A systematic literature review on the influence of aggression subtype and gender



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## ABSTRACT

Hostile attributions of intention have been discussed in relation to the development and maintenance of aggressive behavior in children for over thirty years. In this time, factors such as subtypes in the function (reactive versus proactive) and form (relational versus physical) of aggression as well moderators of aggression, such as gender, have been studied in increasing detail in relation to attributions of intention. The present article reviews the literature on hostile attributions and aggressive behavior in children and adolescents under consideration of aggression subtypes and the influence of gender. Results of 27 empirical research articles show that hostile attribution biases (1) are more consistently related to reactive rather than proactive aggression, (2) show evidence for separate pathways between relational and physical aggression and the respective attribution bias, and (3) are associated with aggression in both genders, with no clear gender differences in association strength. Implications for cognitive training to reduce attribution bias in treatment of childhood aggression and an outlook on further research domains are discussed.

## 1. Introduction

In everyday processing of social behavior, the attribution of an underlying benign, neutral or hostile intention to the action of another is a predominant factor influencing an individual's response to that action. In particular, ascribing hostile intention to a behavior is associated with an increased likelihood to engage in an aggressive response (Bjoerkqvist, Lindstrom, & Pehrsson, 2000; Calvete & Orue, 2010). Such attributions have therefore been incorporated in numerous discussions on the development, maintenance and treatment of aggressive behavior in childhood and adolescence. The tendency to attribute hostile intention (termed “hostile attribution bias”, or HAB; Nasby, Hayden, & DePaulo, 1980) has been shown to correlate positively with aggressive behavior in community children and adolescents (Dodge, 1980; Godleski & Ostrov, 2010; Nelson, Mitchell, & Yang, 2008), in children with clinical levels of aggressive or delinquent behavior (Dodge, Price, Bachorowski, & Newman, 1990; Gomez, Gomez, DeMello, & Tallent, 2001), and with clinical diagnoses of conduct disorder (CD), oppositional defiant disorder (ODD), or attention deficit/hyperactivity disorder (ADHD) (Bickett, Milich, & Brown, 1996; MacBrayer, Milich, & Hundley, 2003).

However, although the association between aggressive behavior and HAB in multiple areas of society and across a broad age range has been well-established, the effect size of this relationship varies widely across studies. A meta-analysis including 41 studies and 6017 participants reported an overall effect size of  $r = 0.17$  ( $Z = 11.25$ ,  $p < .001$ ) for the relationship between aggressive behavior and hostile attributions (Orobio de Castro, Veerman, Koops, Bosch, & Monshouwer, 2002). However, effect sizes across these studies ranged from  $r = -0.29$  to  $r = 0.65$ . Along with several methodological characteristics, the authors calculated effect size differences among studies in relation to specific characteristics of the study participants, including aggression type, sociometric status, intelligence, age, and gender. Studies including 8–12 year old, more severely affected participants who were additionally socially rejected reported the highest effect sizes. However, some child characteristics were difficult for the authors to compare between studies. In particular, differences based on aggression type and gender could not appropriately be addressed due to either a lack of specificity (aggression) or a lack of studies (gender) in the existing literature.

Since publication of this meta-analysis, the literature on aggression and HAB has expanded considerably. In particular, the assessment of

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subtypes of aggression has become more common. Not only do studies distinguish between functions of aggression (reactive versus proactive), but increasing attention is being paid to differences in the form of aggression (relational versus physical) (Crick, 1995). The latter was not addressed by Orobio de Castro and colleagues, as its assessment in relation to HAB had not been investigated at the time. In addition, the consideration of gender differences in the relationship between aggression and HAB could only partially be addressed due to a lack of studies including female only samples. In the past 15 years, however, studies investigating aggression function and form, and studies including female samples have become much more common. The aim of the present review is therefore to provide a systematic overview of the literature on aggression and HAB with respect to these three factors.

### 1.1. Function of aggression: reactive vs. proactive

Aggression can be divided into two types according to its function: **reactive or proactive**. Reactive aggression is considered highly related to the emotion of anger, occurs in reaction to frustration or perceived threat, and is emotionally “hot”, impulsive or automatic. Proactive aggression, in contrast, is considered premeditated, or “cold”. It is instrumental, serving to achieve an anticipated reward for the aggressor (Vituro, Brendgen, & Barker, 2006). It has been suggested that differences in the function of aggression which children display correspond to deviations in distinct social information processing (SIP) steps. Specifically, it has been proposed (Crick & Dodge, 1996; Dodge & Coie, 1987) that children high in reactive aggression interpret hostile intention in the actions of others (perceived threat), while children high in proactive aggression evaluate aggression more positively and expect positive outcomes for aggression (anticipated reward) (Dodge, 2006). If this is the case, it would indicate the importance of emphasizing, to the extent possible, different aspects of SIP in treatment programs, dependent on the underlying function of a child's aggressive behavior. Therefore, the first question addressed in this review is whether there is evidence for distinct relationships between both reactive and proactive aggression and hostile attribution biases, independently of the interrelation between the aggression types themselves (Question 1).

### 1.2. Form of aggression: physical vs. relational

Aggression can be also divided into two types according to its form: **physical or relational**. The majority of evidence to date supports the notion that physically aggressive children display HAB in response to physically provocative situations (for example, being hit with a ball or having one's toy broken; in following “physical HAB”). Beginning with the work of Crick and colleagues in the 1990s, however, ever more consideration has been given to the study of relational aggression, i.e. the infliction of harm via actual or threatened damage to, or control of, relationships (Crick & Grotpeter, 1995). Crick (1995) developed vignettes of ambiguous relational aggression such as social exclusion (for example, not being invited to a friend's birthday party; in following “relational HAB”). It was proposed that individuals engaging in physical aggression correspondingly show physical HAB, while those engaging in relational aggression show relational HAB (Crick, Grotpeter, & Bigbee, 2002). It has also been suggested that HAB acts as a mediator between relational and physical victimization and development of the respective type of aggression (Ostrov, Hart, Kamper, & Godleski, 2011). The current article therefore reviews the evidence for distinct relationships between relational aggression and relational HAB on the one hand and physical aggression and physical HAB on the other. In addition, evidence of mediation effects between relational and physical victimization and relational and physical aggression via the respective form of HAB will also be reviewed (Question 2).

### 1.3. Gender

The meta-analysis by Orobio de Castro and colleagues found that in population-based samples, studies which included only boys reported approximately two times larger effect sizes for the relationship between HAB and aggression than did studies with mixed-gender samples (Orobio de Castro et al., 2002). In studies with extreme group samples, however, effect sizes did not differ between mixed-gender and male-only samples. However, in this meta-analysis it was not possible to compare male-only and female-only samples, as there was only one study with a female-only sample. Over the last fifteen years, numerous studies with all-female samples have been published. As such, it is now possible to consider gender differences of HAB in relation to aggression more appropriately. The current review considers whether there is evidence of a relationship between HAB and aggression in female-only samples and whether the strength of this relationship has been compared to male-only samples (Question 3).

In summary, the goal of the current review is to assess the relationship between aggression and hostile attribution biases when considering the distinctions in function and form of aggression. In addition, gender differences for each aggression subtype in relation to hostile attribution biases will be reviewed. Given this aim, the current review does not summarize the literature on the overall relationship between aggression and HAB, as has been reviewed elsewhere (Dodge, 2006), but rather aims to expand and newly examine previous findings in light of these three particularly specified aspects.

## 2. Method

To answer the above questions, a systematic literature review was undertaken. A literature search in the electronic databases PsycInfo and PubMed was conducted on June 22nd 2017 using the search terms [“hostile attribution\*” or “attribution bias” or “attribution of intent”] AND [“conduct disorder” or “conduct problems” or “behavior problems” or “aggression” or “anger”] AND [“children or adolescents”]. Studies were included in the initial screening if they included a valid and reliable measure of aggressive behavior in children and adolescents and if HAB was assessed with one of the following measures: vignettes of provocations (read aloud, read silently or in combination with picture representations), videos of provocations, real-life provocations, or interpretations of neutral or morphed emotional expressions. In a second step, papers referenced in the previously identified articles were included when these also fit the above-mentioned inclusion criteria. Lastly, the question-specific inclusion criteria were implemented for including articles for each question being investigated (see Table 1). An overview of the articles included per question is given in Tables 2–4.

## 3. Results

A total of 219 publications were identified in the database search. An additional 33 publications were identified by hand searching. After removing duplicates, 216 abstracts were screened for inclusion. In a second step, implementation of the question-specific inclusion criteria

**Table 1**  
Inclusion criteria per question of the current review.

Question	Inclusion criteria
1	Articles separately assessed and reported the relationship of only reactive aggression, only proactive aggression, or both, with HAB.
2	Articles separately assessed and reported the relationship of either only relational aggression with relational HAB, only physical aggression with physical HAB, or each aggression form with each HAB form.
3	Articles reported the strength of the association between aggression and HAB for females only or for females and males separately.

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