

Original Article

From hitting to tattling to gossip: An evolutionary rationale for the development of indirect aggression

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Abstract: Adult humans are characterized by low rates of intra-group physical aggression, relative to both human children and non-human animals. I propose that the suppression of physically aggressive tendencies has been achieved partly through the replacement of dominance hierarchies by prestige hierarchies, driven by indirect reciprocity and mediated by indirectly aggressive competition and linguistic transmission of reputations. Reviewing the developmental literature on indirect aggression and related constructs provides three pieces of evidence that evolutionarily old impulses towards physical aggression are gradually socialized into indirect aggression: (i) physical aggression falls in early childhood over the same age range during which indirect aggression increases; (ii) the same individuals engage in both physical and indirect aggression; and (iii) dominant individuals practice indirect aggression more frequently. Consideration of the developmental course of indirect aggression is complemented by analysis of similar developments in verbal behaviors that are not necessarily aggressive, namely tattling and gossip. Two

developmental transitions in indirect aggression and related behaviors are postulated. The first occurs in early childhood as children become aware of norms against physical aggression. The second occurs in preadolescence with the development of increasingly covert forms of reputational competition, as children try to renegotiate their status within peer social networks.

Keywords: (3-6 keywords here) dominance, evolution of cooperation, indirect reciprocity, language, prestige, reputation

Introduction: Aggression and Indirect Reciprocity

Humans are a remarkably cooperative species, able to live in much larger societies than other mammals (Dunbar, 2004; Hrdy, 2009). One aspect of this cooperativeness is that most humans show low rates of physical aggression towards other individuals (Hrdy, 2009; Pinker, 2011). A particularly striking feature of human societies, at least compared to chimpanzees, is the relative absence of direct physical aggression between same-sex males within the same group, who are after all potentially in fierce competition over mates (Boehm, 1999; Wrangham, Wilson, and Muller, 2006). Yet it is noticeable that in young children, intrasexual physical aggression is much more common than in older children and adults (Tremblay, 2000). Given that children share a higher propensity for aggression with our closest living relatives, an evolutionary developmental account holds promise for explaining how directly aggressive behavior is socialized out of children, leading to the evolutionary novelty of relatively peaceful behavior in most human adults.

Most aggressive interactions in both human and non-human societies are caused by

conflicts over resources: particularly mates, but also food and territory (which can lead to access to both food and mates). Within other social mammals such as chimpanzees, such interactions tend to be suppressed and regulated by means of dominance hierarchies, which lead to low-ranking individuals backing off without a fight when threatened by high-ranking individuals (De Waal, 2007; Lorenz, 1966; Watts, 2010). As with non-human animals, so with human children: preschoolers tend to organize themselves into well-defined dominance hierarchies; and most agonistic interactions are transient and one-sided, because dominant individuals are more likely to initiate aggression, and their subordinates tend not to retaliate (Hawley, 2003; Ingram and Bering, 2010; Strayer and Strayer, 1976). However, the preschool is a small social world, and young children do not have many acquaintances. At least in the modern world, adult groups are too large, complex, and anonymous to be regulated by dominance hierarchies alone: some other mechanism must be responsible for helping to reduce conflict and promote cooperation in adult populations.

One possible mechanism of this kind is indirect reciprocity (Alexander, 1987; Nowak and Sigmund, 2005). This is an extension of Trivers's (1971) idea of direct reciprocity, based on the idea that if you scratch my back, someone else (perhaps a relative or other associate of mine) will scratch yours. Conversely, if you scratch my associate's back, I will scratch yours; and if you stab me in the back, my associate may stab you in yours. Indirect reciprocity may be unique to humans, since its power is greatly amplified by language (Flinn and Alexander, 2007; Nowak and Sigmund, 2005): there may not be many direct witnesses to an aggressive interaction who can retaliate on behalf of the victim; but as long as the victim survives, information about the perpetrator's identity can be spread

throughout a social group through acts of linguistic communication—often glossed as gossip—leading to a downgrading of the latter’s reputation (Dunbar, 2004; Ingram, Piazza, and Bering, 2009). Similarly, Boehm (1999) argued that in small groups of humans—most notably in hunter-gatherer societies—language is used to build coalitions that inhibit the formation of rigid hierarchies led by a dominant male, as are characteristic of chimpanzee societies (De Waal, 2007).

Given that indirect reciprocity greatly expands the scope of potential retaliators to aggression, it may well be adaptive to inhibit *direct* aggression, in which the author of the aggression is easily identifiable and the effects are unambiguously damaging to the victim, in favor of *indirect* aggression, in which both author and effects are more ambiguous. The two senses of “indirect” used in these two concepts are not the same, since indirect reciprocity may involve repayment to a different target from the one from whom one received an initial positive or negative action; whereas indirect aggression implies action against the same target towards whom aggressive impulses are felt. Nevertheless, I argue that the inhibition of directly aggressive strategies relies on a developmental process in which direct forms of aggression in children are “socially selected” against (cf. Boehm, 2012) by both adults and peers, by means of indirect reciprocity, and gradually replaced by indirect forms of aggression. In turn, the simple dominance hierarchies mediated by physically aggressive interactions that are characteristic of children and chimpanzees are replaced in adult humans by *prestige hierarchies* (see Henrich and Gil-White, 2001) based on competition over reputation, mediated by indirect aggression.

Development of Indirect Reciprocity and Indirect Forms of Aggression

The implication of indirect reciprocity in the socialization of aggression is plausible because from a very young age—perhaps as early as 5 months (Hamlin, Wynn, Bloom, and Mahajan, 2011)—infants and young children prefer to interact with toys or puppets that have exhibited prosocial rather than antisocial behavior (Hamlin, Wynn, and Bloom, 2007; Kenward and Dahl, 2011; Vaish, Carpenter, and Tomasello, 2010). Such responses have been argued by these authors to be early forms of indirect reciprocity. Moreover, in a demonstration of the potential of language to mediate third-party punishment, children as young as 2 reliably *tattle*—i.e., report a peer’s misbehavior to an adult or a more powerful peer—on individuals who violate social norms, in home, preschool and experimental settings (Den Bak and Ross, 1996; Ingram and Bering, 2010; Schmidt, Rakoczy, and Tomasello, 2011; Vaish, Missana, and Tomasello, 2011). Hence children may quite early in life become aware of the potential for their antisocial actions to be punished by third parties, who may even be absent at the time of the transgression: Ingram and Bering (2010) found that tattling was far more often linked to punishment of the child who was tattled on than of the child who did the tattling. Recent research indicates that by the age of 5, this incipient concern with reputation may lead children to be more generous and less likely to violate social norms in settings where their actions are public, compared to settings where they are anonymous (Engelmann, Herrmann, and Tomasello, 2012; Leimgruber, Shaw, Santos, and Olson, 2012; cf. Piazza, Bering, and Ingram, 2011). Note however that all these authors acknowledge that their results do not necessarily indicate an explicit form of

reputation management: with such young children, indirect reciprocity is likely to work only at an ultimate rather than a proximate level.

Naturally, children continue to be motivated to aggress against peers, for various reasons, whether reactively retaliating against a perceived offence by the other child, or proactively enforcing or contesting their position in the dominance hierarchy (see, e.g., Prinstein and Cillessen, 2003, for a discussion of proactive and reactive aggressors). Hence they will gradually learn that aggressing indirectly, rather than directly, is less likely to result in unfavorable outcomes such as punishment or escalated retaliation. Similar arguments have been made outside of an explicitly evolutionary theoretical framework by Björkvist, Lagerspetz, and Kaukiainen (1992), and by Berkowitz (2003); while Goldstein, Tisak, and Boxer (2002) found that preschoolers rated relationally aggressive responses to provocation as more acceptable than physically or verbally aggressive responses. The relative benefits of indirect aggression will apply even in cases in which, were it not for indirect reciprocity and the spread of reputationally relevant information relevant via language, dominant individuals might feel quite secure in aggressing (e.g., when retaliating against a lower-ranking individual; cf. Boehm, 1999).

So far I have referred to ‘indirect forms of aggression’ without defining this construct explicitly. An issue is that there are three separate research traditions in this area, which have investigated three related theoretical constructs, under the names of indirect, relational and social aggression (Archer and Coyne, 2005; Heilbron and Prinstein, 2008). In an integrative review, Archer and Coyne (2005) argued that all three constructs draw on essentially the same form of aggression, suggesting that they each represent “an alternative

aggressive strategy used for individual or situational reasons when the costs of direct confrontation are high” (p. 213). This approach seems reasonable, but it is important also to keep in mind the differences between the constructs. The construct that best fits Archer and Coyne’s definition is *indirect aggression*, where “the aggressor may remain unidentified, thereby avoiding both counterattack from the target and disapproval by others” (Lagerspetz, Björkqvist, and Peltonen, 1988, p. 404). This form of aggression is often, but not necessarily, covert—it can include behaviors such as telling someone that one is not their friend (Björkqvist et al., 1992)—and may be either verbal (e.g., spreading rumors about someone) or non-verbal (e.g., putting chewing-gum on someone’s chair; see Goldstein et al., 2002). *Relational aggression*, defined as “harming others through purposeful manipulation and damage of their peer relationships” (Crick and Grotpeter, 1995, p. 711) is typically verbal and does not always involve a third party, but is sometimes based on a direct threat to the victim’s own relationship with the aggressor (termed relational manipulation; see, e.g., Ostrov and Godleski, 2010). *Social aggression* (Cairns, Cairns, Neckerman, Ferguson, and Gariépy, 1989; Galen and Underwood, 1997) is similar to relational aggression, except that it can include non-verbal, but also non-violent, means of direct aggression such as gestures and facial expressions, which are not usually considered to be forms of relational aggression. Here I follow Archer and Coyne (2005) in using the term “indirect aggression” to refer to behavioural data gathered by all three research traditions, since this was the first of the three terms to appear in the scientific literature (dating back at least to Lesser, 1959). In the rest of the article I will try to preserve individual authors’ use of one of the above terms as far as possible, though it

should be noted that different authors do not always use them in consistent ways.

In the next section, I trace the development of direct and indirect aggression through childhood and adolescence, showing some of the ways in which direct aggression may be replaced by indirect aggression. Following that, I argue that a similar developmental pattern applies to two forms of everyday verbal behavior that are not always seen as aggressive, namely gossip and tattling, raising the possibility that indirect aggression may be part of a broader system of inhibition of directly aggressive responses. I then analyze the links between indirect aggression and social dominance, arguing that indirect aggression, tattling and gossip underpin the development of dominance hierarchies into prestige hierarchies as children grow older. Finally, I investigate what may be driving the developmental changes in indirect aggression that I identify in the course of this article.

Changes in Direct Aggression and Indirect Aggression Through Childhood

Up until the 1990s, many psychologists favored social learning accounts of aggressive development (discussed by Tremblay, 2000), in which physical aggression was seen as a learned but maladaptive response to frustration, acquired by observing adult models of the behavior. These accounts were undermined by studies showing that the great majority of 18–24-month-old infants sometimes practiced forms of physical aggression (e.g., Alink et al., 2006). Most toddlers use physical aggression from time to time, while a minority almost never use it and another minority use it frequently (Tremblay, 2000). Frequency of physical aggression increases up until the age of about 3 before decreasing steadily thereafter (Côté, Vaillancourt, LeBlanc, Nagin, and Tremblay, 2006): a major

longitudinal, multinational study by Broidy et al. (2003) found that most children reduce the frequency of physically aggressive behavior throughout their school careers.

Crucially, over the same age range (4–8) at which levels of direct physical aggression start to fall, levels of indirect aggression rise in the same individuals (Côté, Vaillancourt, Barker, Nagin, and Tremblay, 2007; Vaillancourt, Miller, Fagbemi, Côté, and Tremblay, 2007). However, physical aggression then briefly rises again—alongside indirect aggression—during preadolescence. For instance, Björkqvist et al. (1992) compared levels of physical, verbal and indirect aggression in a cross-sectional sample of Finnish boys and girls at ages 8, 11, and 15. All three forms of aggression peaked at age 11; yet verbal and indirect aggression increased in frequency between 8 and 15 and overtook physical aggression, which was initially more common but declined with age (see Figure 1 below).

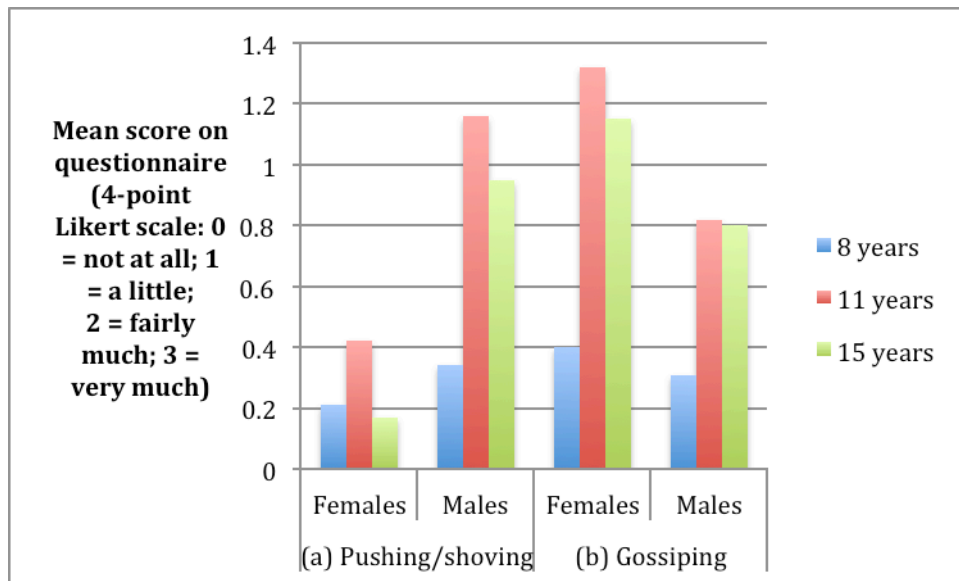


Figure 1. Mean answers (across all participants, as rated by all classmates) for two representative questions from an aggression questionnaire: (a) How much does someone push or shove others? (b) How much does someone gossip about others? (redrawn from data in Björkqvist et al., 1992)

Similarly, Cairns et al. (1989) found that social aggression increased dramatically—at least for girls—as their participants moved from 4th grade (age 9/10) to early adolescence. The later tendency of indirect aggression to decrease slightly in frequency is complicated by the fact that it also seems to become more covert, and therefore perhaps more hidden from researchers. In young adulthood—and presumably even more so at older ages—aggressive moves are sometimes disguised as “rational-appearing” argument, especially perhaps in work contexts (Björkqvist, Osterman, and Lagerspetz, 1994; Kaukiainen et al., 2001). Yet this process of covering up indirect aggression starts well before the frequency of indirect aggression has peaked. In middle childhood, relational aggression gradually becomes more sophisticated (Crick et al., 1999). Instead of directly threatening not to be someone’s friend, as in the preschool years, 8–11-year-old children are “more likely to focus on an individual’s social group, with aggressors excluding and ignoring individuals or spreading vicious rumors about them” (Archer and Coyne, 2005, pp. 221–222). This is paralleled by Laursen, Finkelstein, and Betts’s (2001) meta-analytic finding that as young people move through adolescence, disengagement and negotiation become more common responses to conflict relative to coercion, which predominates at earlier ages—raising the possibility that increasing rates of indirect aggression may be just one element of increasingly indirect, sociocentric responses to conflict in general.

However, caution should be exercised in considering this proposed developmental trend. Sixteen years after Björkqvist et al. (1992) proposed that a reduction in direct aggression is accompanied by an increase in indirect aggression during middle childhood, Heilbron and Prinstein (2008) argued that it was still premature to regard this theoretical

model as well supported by the research evidence, since there have not been many long-term longitudinal studies examining the transition from direct to indirect strategies within particular individuals over many years. (An important exception was the large-scale National Longitudinal Survey of Children and Youth—NLCSY—in Canada; see Côté et al., 2007; Vaillancourt et al., 2007). The situation is further complicated by the existence of many hard-to-replicate gender effects in the literature, some of which suggests that the rise in indirect aggression during this age range might be specific to girls, or at least much stronger among girls (e.g., Vaillancourt et al., 2007). Another important point is that most studies find that the same individuals practice both physical and nonphysical forms of aggression: in a meta-analysis, Card, Stucky, Sawalani, and Little (2008) were able to demonstrate a strong intercorrelation ($r = .76$) between direct and indirect aggression at an individual level. This is just what one would expect if both forms of aggression were practiced by people with high levels of aggressive impulses, but the external forms of their aggressive behavior were altered by socialization processes (Berkowitz, 2003).

According to the limited evidence that is currently available, we can say that across children as a group there are two major developmental transitions relating to a reduction in physically aggressive behavior. The first reduction begins in early childhood, following a rise in physical aggression during toddlerhood, and is certainly associated with a broadly simultaneous rise in indirectly (but not covertly) aggressive behavior. The second reduction takes place during adolescence, following a brief rise in physical aggression during preadolescence and early adolescence, and may be associated with a simultaneous but less dramatic *fall* in indirect aggression. Before considering what is responsible for these shifts,

I will examine parallel changes in a related form of behavior that is not necessarily classed as aggressive: the everyday verbal activity of gossip.

Development of Gossip and Tattling

A key contention of this article is that aggression, as classically defined, is not the only type of behavior that becomes increasingly indirect as children get older. Overt verbal protests about another individual's norm violations are theoretically likely to be replaced by covert gossip, since the former can trigger emotionally damaging verbal conflicts (Goodwin, 1990), which can even spill over into physical conflicts. While malicious gossip is often used as an index of indirect, relational or social aggression, here I am defining gossip more broadly as any behind-the-scenes talk about another individual's behavior. The relatively low frequency of indirect aggression in early childhood is paralleled by the very low frequencies of gossip found by the few studies that have focused on gossip in children younger than 10. After coding and analyzing the natural conversations of dyads of girls aged 6–7, 11–12, and 16–17, Mettetal (1983) found that the frequency of gossip increased dramatically between the youngest and middle age groups, remaining at a similar level—about one-third of all conversation—in the oldest group. A similar longitudinal pattern, for younger age groups, was found by Engel and Li (2004), who asked three groups of children—aged 4, 7 and 10—to tell stories about their friends in semi-structured interviews. The length, descriptiveness and evaluative content of the stories all increased significantly with age, implying that the younger children's stories were far less informative than the older children's. This supported Engel and Li's naturalistic observation, from tape

recordings of conversations in a daycare center, that 4-year-old children very rarely tell stories about absent peers: “It was surprisingly difficult to catch the children gossiping” (2004, p. 160). Preschoolers’ lack of gossip is reflected in aggression researchers’ methods: whilst negative gossip is used as one of the main indices of indirect aggression and related constructs in older age groups, even those questionnaires designed for preschool children that measure indirect rather than relational aggression make little mention of gossip, presumably because it is not a category of discourse that makes sense for such young children (but see Ostrov, Woods, Jansen, Casas, and Crick, 2004, p. 367, for an example of misfired secret-telling among preschoolers).

While covert gossip is rare among young children, there is another kind of verbal discourse that is very common in this age group. *Tattling* has been defined as “the reporting to a second party of a third party’s counter-normative behavior” (Ingram and Bering, 2010, p. 945). This broad definition actually subsumes negative gossip, since tattling may be overt or covert; but in practice, with young children, it is normally overt (Ingram, 2009). Tattling has been observed to take place in home settings against siblings (Den Bak and Ross, 1996; Ross and Den Bak-Lammers, 1998), in preschool and elementary school settings against peers (Ingram and Bering, 2010; Lancelotta and Vaughn, 1989), and in laboratory settings against puppets (Rakoczy, Warneken, and Tomasello, 2008; Schmidt et al., 2011; Vaish et al., 2011). Tattling may not be a prototypical form of indirect aggression, since the intended audience is typically an adult rather than a peer; and as long as the content of tattling is not too trivial, parents or teachers may see it as justified. Yet tattling was often used as an example of indirect aggression in earlier studies, before the

latter construct was formalized (e.g., Lancelotta and Vaughn, 1989; Lesser, 1959). More recently, Ingram and Bering (2010) found that tattling had a number of features that suggest it is related to indirect aggression in interesting ways.

First, observed frequency of tattling correlated with the Relational Aggression subscale of the PSBS-T form (Preschool Social Behavior Scale—Teacher form; see Crick, Casas, and Mosher, 1997, and Ostrov et al., 2004, for discussion of this instrument): the children who tattled the most tended to be rated by teachers as engaging most often in relational aggression (Ingram and Bering, 2010). Second, tattling usually takes place to an adult authority figure such as a parent or teacher, and often results in punishment for the target of tattling but not for the tattler themselves, thereby reducing the target child's standing relative to the child who is doing the reporting. Third, tattling is a very common form of discourse for young children, making up about 60% of all talk about third parties in Ross and Den Bak-Lammers's (1998) sample of 6-year-olds, 80% in their sample of 4-year-olds, and as much as 90% in Ingram and Bering's (2010) sample of 3–4-year-olds. Fourth, tattling has been observed in younger children (23–31 months in Den Bak and Ross, 1996; 34–38 months in Schmidt et al., 2011) than have taken part in indirect aggression studies—yet Ross and Den Bak-Lammers (1998) also showed that tattling between siblings increased in frequency between the ages of 2 and 4, and 4 and 6, just as indirect aggression does. Therefore, even if tattling is not a prototypical form of indirect aggression, it looks like it may fill a gap, in terms of providing an outlet for aggressive impulses, that is left by the decline in physical aggression from age 3 and the relative absence of prototypical indirect (i.e., covert) aggression until a few years later. Of course,

there may be individual differences here in that for some children who rarely tattle, the behavior may simply represent justified outrage at another individual's norm violation.

As children enter middle childhood, the absolute frequency of tattling may continue to rise, even as there is a fall in the proportion of conversation about others that it comprises. Ross and Den Bak-Lammers (1998) found that 6-year-olds tattled on their younger siblings 40% more frequently than when they were 4, but over the same age range their rate of positive or neutral descriptions of sibling behavior more than quadrupled. Unfortunately, to my knowledge there has not been any systematic observational study of tattling in children older than six. I therefore turn to vignette studies, which have examined changes in the acceptability of tattling and gossip for older children.

As part of his classic investigation into the development of moral judgment, Piaget (1932, ch. 3) told 6–10-year-old children a story about a father with two sons, one “good” and one “silly”, who went away on a long journey, and on his return asked the good son to tell him about anything “naughty” that the silly son had done. The participants were then asked what the good son ought to do. The younger children tended to say that he should obey his father and report on his brother's actions, while the older children more frequently said that he should not, as it would lead to the brother being punished. Loke, Heyman, Forgie, McCarthy, and Lee (2011) recently used a very similar methodology to update and extend Piaget's findings. They found that 8–11-year-old-children distinguished between tattling on major transgressions (e.g., putting worms in someone's shoes) and on minor transgressions (e.g., not eating one's vegetables at lunch), seeing the former kind of tattling as appropriate but the latter as inappropriate. However, 6–7-year-old children made

no such distinction. So what this seems to indicate is that as children move out of middle childhood, they start to recognize that trivial tattling—in the sense of reporting minor norm violations—is something that causes unnecessary harm or annoyance to other children and should therefore be avoided. Conversely, the use of covert gossip may be increasingly positively evaluated over a similar age range: Kuttler, Parker, and La Greca (2002) examined preadolescents' attitudes to hypothetical instances of gossip, and found that surprisingly, 5th/6th graders (average age: 11.40 years) expressed significantly *less* skepticism about gossip than 3rd/4th graders (average age: 9.65 years). This parallels the increasing frequency in gossip reported by Mettetal (1983) and by Engel and Li (2004)—reviewed at the start of this section—and perhaps reflects preadolescents' increasing use of gossip to make social evaluations in everyday life.

To sum up, I have argued in this section that although rates of prototypical (i.e., covert) indirect aggression are low in early childhood, tattling may serve as a form of overt indirect aggression that is very common for this age group, and meets the aggressive child's drive to punish perceived norm violators. Given the rise in indirect and social aggression in preadolescence (Björkqvist et al., 1992; Cairns et al., 1989) and the simultaneous fall in skepticism about gossip (Kuttler et al., 2002), one possibility is that the motives that produce overt tattling in young children are diverted into producing covert negative gossip in preadolescents and teenagers. In the final section, I attempt to explain why this developmental shift might take place. Before that, I briefly examine the links between indirect aggression and dominance.

Dominance, Prestige, Indirect Aggression, and Tattling

A key part of my argument is the contention that behaviors like indirect aggression, gossip and tattling support the creation of *prestige hierarchies*, in which most competition take place in the realm of linguistically mediated reputation, rather than via physical means as with simple dominance hierarchies. Prestige hierarchies help to coordinate members of a large social group by reducing direct conflicts between them, which might otherwise escalate into large-scale feuds based on cycles of indirect reciprocity. It follows that dominant individuals should engage in more indirect aggression, gossip and tattling than their subordinates. Another prediction is that they will also be more frequent targets for such behaviors (cf. McAndrew, Bell, and Garcia, 2007) but I will not attempt to evaluate this hypothesis here.

There is a superficial problem for this theory in that numerous studies (reviewed by Heilbron and Prinstein, 2008) have demonstrated *negative* links between indirect aggression (or related constructs) and peer acceptance, likeability or social preference; and positive links with apparently maladaptive sociometric measures such as rejection and exclusion. This is the case for preschoolers (e.g., Crick et al. 1997; Ostrov et al., 2004), elementary-school-age children (e.g., Crick and Grotpeter, 1995; Lancelotta and Vaughn, 1989), young adolescents (e.g., Cillessen and Mayeux, 2004), and young adults (e.g., Werner and Crick, 1999). However, as Heilbron and Prinstein (2008) have pointed out, *likeability* is only moderately correlated with *popularity*. Popularity measures, obtained by asking children who are the most popular individuals in their class, rather than whom they

personally like best—or by measuring social centrality directly—may be a better indicator of children’s dominance hierarchies than likeability measures, because there is no reason why powerful individuals should necessarily be well liked (as the examples of politicians and bankers attest). The positive link between indirect aggression and popularity may also be more reliable than the negative link between indirect or relational aggression and likeability, since many of the studies reporting the latter link found that it was limited to one or other gender (e.g., Crick et al., 1997; Ostrov et al., 2004), whereas this was not the case for most of the studies reporting a popularity effect (e.g., Andreou, 2006; Cillessen and Mayeux, 2004; Prinstein and Cillessen, 2003; Xie, Cairns, and Cairns, 2002). And among preschoolers, where it is easier to assess dominance directly by observing physical interactions, Ostrov and Keating (2004) found associations between dominance and verbal and relational aggression (albeit mediated by gender).

One way of making sense of this rather complex pattern of results is through Hawley’s (1999) “resource control theory”. According to this theory, certain individuals (termed “bistrategic controllers” or simply “bistrategics”) use a mixture of prosocial and aggressive strategies to achieve dominance within their peer group (see Hawley and Geldhof, 2012, for recent empirical examples). They may thus be simultaneously disliked and perceived as popular—unlike their peers who use only aggressive strategies, who are both disliked and unpopular. Indirect aggression is an appealing strategy for bistrategics, since it allows them to be antisocial to one peer under the guise of being neutral or even prosocial to another (e.g., by providing them with useful information in the form of gossip). And indeed, Hawley, Little, and Card (2007) found high levels of relational aggression in

both girls and boys identified as bistrategic. These individuals are also predicted to have high social impact (defined sociometrically as the sum of peer acceptance and rejection), which has independently been found to be positively associated with relational aggression (Zimmer-Gembeck, Geiger, and Crick, 2005). Bistrategics are also predicted to have strong social skills—necessary for working out which type of strategy to use in particular contexts—and several studies have found socio-cognitive skills to be associated with relational aggression (e.g., Andreou, 2006; Carpenter and Nangle, 2006). The relationship between indirect aggression and social dominance may thus be driven by a subset of rather Machiavellian young people, who use socially aggressive strategies and sophisticated socio-cognitive skills to manipulate their peers into giving them what they want. In line with this idea, Ostrov, Ries, Stauffacher, Godleski, and Mullins (2008) demonstrated a link between relational aggression and deception among preschoolers, while Pellegrini and Long (2003) found that socially dominant middle-school girls were more likely to use indirectly aggressive strategies).

Something similar may be going on with tattling. Although the relationship between tattling and dominance has been very little studied, Ingram and Bering (2010) found a strong correlation between the two variables in the one preschool classroom where they examined this relationship. This effect was mainly, though not exclusively, driven by a young girl who clearly fitted the picture of a bistrategic controller (see Ingram, 2009, ch. 4, for ethnographic details). Hence, Ingram and Bering (2010) argued that: “Tattling may be one of several interpersonal strategies—including relationally aggressive behavior such as saying ‘I’m not your friend,’ verbally aggressive behavior such as threats or taunts, and

direct physical aggression such as pushing—which some preschool children use, to varying degrees, to achieve social dominance” (p. 954).

The question then arises of whether tattling continues to be used as a strategy by dominant individuals at older ages. Friman et al. (2004) found a strong negative correlation between tattling and likeability among 12–18-year-old boys in a boys’ home; but since they did not ask about popularity, it is impossible to say for sure whether this reflects the same bistrategic pattern of high popularity and low likeability that is found for indirect aggression at the same age, or whether tattling by this age is a completely derogated strategy. However, the evidence from vignette studies (Loke et al., 2011; Piaget, 1932) on the unacceptability of tattling on peers by this age would suggest the latter interpretation, as would the harsh treatment meted out to adult “snitches” in criminal gangs (Rosenfeld, Jacobs, and Wright, 2003), and even to corporate whistleblowers (Mesmer-Magnus and Viswesvaran, 2005). The suppression of overt tattling would fit well with the idea of the creation of prestige hierarchies, in which direct conflict between individuals is gradually reduced, as some individuals come to use avoidant strategies to escape conflict with others whose reputation precedes them (cf. Laursen et al., 2001).

An Evolutionary Developmental Approach to the Psychology of Indirect Aggression

In this article, I have argued that the presence of networks of indirect reciprocity in human societies encourages the development of strategies of indirect aggression, through which certain individuals can satisfy their inclinations to aggress against peers (for whatever reason) while reducing the risk of retaliation from more powerful associates of

their victims. Reviewing the extensive literature on indirect, relational and social aggression (as already reviewed by Archer and Coyne, 2005, and Heilbron and Prinstein, 2008) offers three main lines of evidence for the contention that indirect aggression is a developmental elaboration of direct aggression rather than a strategy with completely separate motivations. Firstly, indirect aggression increases over the same age ranges at which direct, physical aggression is falling. Secondly, the same individuals are probably responsible for most instances of both direct and indirect aggression (see especially Card et al., 2008). Thirdly, indirect aggression is associated with socially dominant individuals, suggesting that it may be linked to the extension of dominance hierarchies into prestige hierarchies, maintained through oblique conversation rather than direct confrontation.

As well as reviewing the indirect aggression literature, I have suggested that a similar developmental pattern may be present in behaviors that have not traditionally been thought of as aggressive, namely tattling and gossip. This is important, because it indicates that negotiating for position in prestige hierarchies can be done through behaviors that are not superficially aggressive at all (cf. Björkqvist and colleagues', 1994, concept of "rational-appearing" aggression; and Laursen et al., 2001, on withdrawal and negotiation in response to conflict), providing further insight into why human societies are normally so peaceful. Prestige hierarchies reduce overt conflict in two main ways, both of which have interesting theoretical implications: they allow for multi-layered competition based on the idea of diverse skillsets in different arenas of social identity, rather than on a monolithic attribute of "dominance" (Henrich and Gil-White, 2001); and they are socially open-ended in terms of their capacity for plugging in new members based on verbal reputation, without

the need to observe their dominance directly. In the following two sub-sections, I consider the theoretical implications of this argument in terms both of what a developmental perspective can add to evolutionary accounts of human cooperation, and what an evolutionary perspective can add to developmental accounts of indirect aggression.

Contributions of a Developmental Approach to the Evolution of Cooperation

Bjorklund and Pellegrini (2002) have argued that an evolutionary developmental approach can contribute much both to evolutionary psychology and to developmental psychology. A developmental perspective helps us understand the proximate mechanisms that generate evolved behavior, which in turn provides insight into the dynamics of evolved behavior in the real world. One speculative idea that flows from my argument is the possibility of a kind of positive feedback loop involving indirect reciprocity and indirect aggression. Imagine the following scenario: you are a small child in a preschool, and another child has just grabbed a toy that you were recently playing with. Yesterday, you tried to grab it back off him, and ended up in a physical altercation that was only resolved by a severe reprimand from the teacher. This time, you try telling the teacher what has happened, and end up getting another turn with the toy while the other boy has to wait for his turn. Here, your choice of an indirectly aggressive rather than a directly aggressive strategy is not only more peaceful in itself, but it has two side-effects that are also beneficial for the group: the teacher gains useful knowledge about an aggressor's behavior, and the aggressor is impressed with the value accorded by the teacher to a norm of sharing.

Tattling is thus a normative response to a non-normative event, rather than a non-

normative response (as direct aggression is). Hawley and Geldhof (2012) made the similar point that “the tattler invites no punitive response from authority figures” (p. 29), and hence an aggressive action against another child may be cloaked as the socially beneficial action of informing an authority figure about wrongdoing. The positive feedback loop occurs because the aggressor will be less likely to choose a coercive, directly aggressive strategy to try to gain control over the toy in future: if she is astute, she will instead assert the value of a social norm: e.g., “You have to share” (Ingram, 2009). While these dynamics may be less clear-cut for gossip among adults, it is certainly the case that gossip can be spread for selfish motives and yet can have the group-beneficial side-effects of transmitting useful information and reinforcing social norms (Baumeister, Zhang, and Vohs, 2004; Dunbar, 2004; Gluckman, 1968; Wilson, Wilczynski, Wells, and Weiser, 2000). This sort of feedback loop may be linked to the dynamic of “runaway social selection” for prosocial traits, which is argued to have been triggered by the evolution of language (Flinn and Alexander, 2007; cf. Boehm, 2012).

Another contribution of a developmental account is to suggest a couple of ontogenetic transitions that may correspond to important evolutionary innovations. The first potential transition occurs at about 3 years, when tattling and indirect aggression begin just as physical aggression is reaching its peak. According to Tomasello and Vaish (2013), it is at age 3 that young children first become aware that they live in a world of generalized social norms. Indeed, Tomasello and his collaborators who have observed tattling in experimental settings (reviewed by Tomasello and Vaish, 2013) have used it—along with other behaviors that correspond to verbal aggression, such as protesting to or threatening

the offender—to show that children have come to possess a generalized understanding of social norms, and are prone to objecting when other individuals violate them. The inhibition of physically aggressive responses in favour of communicative responses such as tattling may well also require the development of emotion regulation and other executive-functioning skills (Cooney, Hutchison, and Costigan, 1996).

The second potential transition, from overt tattling and relational manipulation to negative gossip and other covert forms of indirect aggression, seems less clearly defined. Partly this is due to the lack of a clear distinction between covert and overt forms of aggression in the indirect/relational/social aggression literature. Based on the vignette studies of both gossip and tattling reviewed in this article, however, it seems likely that this second transition takes place around the age of 9 or 10. Following this transition, overall rates of indirect aggression are gradually seen to fall as they become more and more covert. This seems quite a late development if the introduction of covert aggression is seen as the result of improvements in linguistic skills and social competence during middle childhood (e.g., Crick et al., 1999). After all, 7–8-year-old children are well aware of the effects of language on reputation (Hill and Pillow, 2006); so why do they continue to tattle on peers, when they should know that it will make their targets annoyed with them?

The answer may be connected with fundamental shifts in social networks that take place during preadolescence and early adolescence (Krebs, 2005). A reduction in identification with adult authority figures seems to be part of this realignment, as Piaget (1932) showed with his vignette studies of tattling. The increasingly covert nature of indirect aggression at this age may thus be driven by motivational changes—an increased

concern with peer reputation, rather than with upholding adults' rules. As Krebs (2005) has pointed out, there may be evolutionary reasons for this realignment: for young children who are entirely dependent on adults, it makes sense to 'play by the rules' and even to have adults' interests to heart; but for preadolescents who are potentially approaching their first mating, peer reputation suddenly becomes much more important, as it mediates the negotiation of new coalitional and mating opportunities in social networks. This realignment, and associated upheaval in (and expansion of) preadolescent dominance hierarchies, may also explain why physical aggression spikes and indirect aggression peaks at this age. Note that this is unlikely to be due simply to the transition from primary to secondary levels of education (cf. Pellegrini and Long, 2002), since physical aggression actually falls around the time of entry to primary education (Côté et al., 2006).

Contributions of an Evolutionary Approach to the Development of Indirect Aggression

In order to highlight the potential contributions of an evolutionary approach to developmental accounts of indirect aggression, I will now consider an interesting and apparently transitional phenomenon in the social behavior of certain young people in this same preadolescent age group. Goodwin (1990) analyzed a specific pattern of discourse among black American young people that she called the "he-said-she-said dispute." In the "he-said-she-said"—which can occur among boys but was primarily observed by Goodwin among preadolescent girls—one girl accuses another of saying something about her behind her back. A third girl (known as the "instigator") plays a key role in engineering this confrontation by relaying to the first girl what the second girl allegedly said. During the

confrontation, the first and second girl—sometimes joined by the “instigator”—go back and forth in argument for some time, each trying to save face by painting what was said in a more favorable light to herself. Goodwin argued that this kind of dispute was sometimes used explicitly to rearrange social relationships within the girls’ peer group. Since the he-said-she-said centers on private reports to a third party but is played out in a very public arena (typically the neighborhood street or school playground), it may represent an intermediate stage between overt tattling and covert negative gossip.

Although Goodwin herself was not writing from an evolutionary perspective, reflecting on her work suggests two ways in which researchers studying the development of indirect aggression (and related constructs) might benefit from a consideration of evolutionary ideas. Firstly, the category of *covert* aggression is theoretically critical, because a successfully covert aggressor cannot be retaliated against. The “he-said-she-said” only arises because the instigator chooses to betray a secret that she has been given by a gossip. This suggests that an accurate assessment of the strength and trustworthiness of social relationships—an assessment that is perhaps less available to preadolescents than to older individuals—may determine whether a gossip is secure in confiding in a peer. Yet *covert*ness is not a category that is captured by current distinctions between indirect, relational and social aggression: while indirect aggression is often conceptualized as covert (e.g., by Heilbron and Prinstein, 2008), it can include some overt relationally manipulative behaviors such as telling a peer that one is not their friend (Archer and Coyne, 2005; Björkqvist et al., 1992). Instead of arguing about definitional boundaries between these three constructs, it might be more productive if researchers in these areas adapted their

instruments, or even perhaps reanalyzed their data, to examine the transition from overt relational manipulation to covert indirect aggression.

Secondly, Goodwin (1990) was describing a form of indirectly aggressive ritual contest that was particularly associated with preadolescent girls, but also on occasions practiced by boys. It is not hard to guess why this form of competition was less associated with boys: the latter have their own, more direct, forms of competition at this age group, namely sports, games, and play-fighting (cf. Ingram et al., 2012). There is little mystery here if indirect aggression is viewed as a form of competition within a prestige hierarchy: the intra-female preference for indirect over direct forms of aggression is easily explained by parental investment theory (Trivers, 1972), which leads women to avoid physical confrontations that might affect their ability to nurture offspring (Archer, 2009; Campbell, 1999). Evolutionary theory makes no firm predictions about whether females would actually be more indirectly aggressive than males (Archer, 2009). Yet, perhaps because these forms of behavior are so often viewed as maladaptive (see Heilbron and Prinstein, 2008)—and hence there may be a desire to show that girls are more at risk from them than boys—a large proportion of the literature on indirect, relational and social aggression seems preoccupied with demonstrating just this gender effect. Most reviews have concluded that there is a slight tendency for girls to be more indirectly aggressive than boys (Archer, 2004; Card et al., 2008; Heilbron and Prinstein, 2008). However, this effect is far from universal: it varies according to the local peer context and method of measurement (Archer, 2004), and is associated with different effects on adjustment for both boys and girls from different backgrounds and in different settings (Ostrov and Godleski, 2010;

Putallaz et al., 2007). Given that there are huge, reliable differences in frequency of physical aggression between girls and boys (Archer, 2004; Card et al., 2008), it may be less interesting that girls practice relational aggression slightly more than boys, than that boys practice it about as much as girls.

Rather than being concerned with small gender effects across hundreds of participants, it might be more fruitful to focus on the microdynamics of indirect aggression as it is used in particular contests for dominance in localized peer contexts. Initial research on indirect aggression has been well served by peer-rating and other forms of questionnaire studies, but it might be time to engage with the phenomenon using more in-depth methods. It is encouraging that there has been some interest in observational (e.g., Ostrov et al., 2004) and narrative methods (e.g., Xie et al., 2002). For maximum effect, such studies could be combined with analyses of the effects of social network position on indirect aggression (as in Xie et al., 2002, for social aggression). Longitudinal studies might be used to confirm the predicted decrease in overt relational manipulation and increase in covert aggression from preadolescence onwards. Contextual studies could examine the local drivers of links between indirect aggression and dominance. Finally, experimental studies might test whether transitions in attitudes towards anonymity occur at about the same ages as the theorized transitions in indirect aggression: it might be predicted that sensitivity to anonymity when cheating might arise at around the age of 3, and sensitivity to anonymity when punishing at around the age of 10 years.

Conclusion

In this article, I have provided an evolutionary rationale for the existing observation (e.g., Berkowitz, 2003; Björkqvist et al., 1992) that certain individuals might alter their behavioral strategies from direct to indirect aggression over the course of development, due to the greater likelihood of punishment for the former. Aggression is of course a multifaceted phenomenon, without any single cause: it is not all about competition within a dominance hierarchy. Nevertheless, aggression between mutual acquaintances in a preschool classroom, as in a group of male chimpanzees, always takes place *in the context of* a dominance hierarchy. Whatever the reason for the aggression, the actors' relative positions in the hierarchy help to determine whether, and how, retaliation takes place. I have argued that the evolution of systems of indirect reciprocity, mediated by language, has fundamentally changed the game of dominance in human societies. An expanded potential for retaliation has led to the replacement of dominance hierarchies by prestige hierarchies (cf. Henrich and Gil-White, 2001), mediated by indirect rather than direct aggression. Again, this expanded potential for retaliation applies whatever the reasons for the aggression in the first place.

There are a couple of interesting theoretical directions in which the ideas in this article might be taken. One follows from the point that engaging in conflict through indirect, rather than direct, aggression makes it less adaptively risky for females as well as males to participate in prestige hierarchies. This might have far-reaching consequences for the potential size of human societies, since groups of female chimpanzees tend to be much smaller and based on looser, more egalitarian arrangements (Watts, 2010). Another direction would be to look at gossip and the formation of cliques from preadolescence

onwards. If, as I have suggested here, tattling to teachers becomes derogated in preadolescence because it implies a betrayal of the peer group, then this suggests that gossip might also be prevented from crossing clique boundaries as defined by social identity. This in turn suggests that certain prestigious individuals might be insulated from indirectly aggressive retaliation by people outside their cliques, allowing them to rise to positions of power within the wider society. Yet over the long run, as societies become more integrated, cliques and other social groupings may be subject to the same reputational dynamics as individuals, contributing to a possible reduction in violence over the course of cultural evolution (cf. Pinker, 2011).

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From hitting to tattling to gossip

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