



*Brief report*

## **Sex-biased ratio of avoidant/ambivalent attachment in middle childhood**

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In this study, new evidence is presented of marked sex differences in the distribution of insecure attachment patterns in middle childhood. Attachment was assessed with the Manchester Child Attachment Story Task (MCAST) in a sample of 122 Italian 7-year-olds. The four-way distribution of attachment patterns was significantly unbalanced, with insecure boys more often avoidant (27%) than ambivalent (2%), and insecure girls more often ambivalent (25%) than avoidant (4%). In addition, boys were rated as more severely disorganized than girls on a continuous disorganization score. A survey of previous literature strongly corroborates these findings, showing that similar attachment distributions have been obtained cross-culturally (US, Canada, and Israel) in nearly all of the (relatively few) studies in which children's sex had been taken into account. It is argued that sex biases in attachment avoidance/ambivalence become apparent starting at about 6–7 years, in contrast with the lack of sex-related effects in infancy and early childhood, and probably anticipate the pattern of sex differences found in adults with romantic attachment questionnaires.

In this report, evidence will be provided that, in contrast with common assumptions, the distribution of children's attachment patterns shows marked sex-related effects. Apparently starting from middle childhood (i.e. about 7–11 years), insecure patterns become highly sex-biased, with males showing a prevalence of avoidant (A) patterns and females showing an opposite majority of ambivalent (C) patterns. A review of the literature reveals that this effect has been previously reported by a number of investigators in different nations, but it has never been recognized as a genuine feature of attachment development, nor discussed in any depth. The aim of the present paper is thus twofold: (1) to bring the relevant evidence together and (2) to add supporting data from a new region (Italy). It is hoped that pointing out this effect will prompt researchers to pay more attention to possible sex differences in attachment styles, and to start investigating their causes both theoretically and empirically.

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### **Patterns of attachment**

One of the most remarkable achievements of attachment theory was the discovery that early child caregiver relationships can be categorized in a limited number of interactional patterns (or 'styles'), first described by Ainsworth, Blehar, Waters, and Wall (1978). The behaviour of infants upon the Strange Situation separation-reunion procedure can be classified as belonging to a *secure* (B) pattern, and two *insecure-anxious* ones, namely the *avoidant* (A) and the *ambivalent-resistant* (C) pattern. Moreover, *disorganized/disoriented* (D) patterns can also be identified (see Lyons-Ruth, Bronfman, & Parsons, 1999). For a thorough description of attachment patterns and their developmental correlates, see Weinfield, Sroufe, Egeland, and Carlson (1999) and Thompson (1999).

Although there is some debate on whether attachment is better described in a categorical versus dimensional fashion (for an overview, see Fraley & Spieker, 2003, and subsequent commentaries), the ABCD (or *four-way*) scheme is one of the most powerful concepts in attachment theory, and it has been widely applied beyond first infancy. Today, many assessment procedures have been developed to evaluate attachment in infants and children (Kerns, Schlegelmilch, Morgan, & Abraham, 2004; Solomon & George, 1999). Testing procedures involve actual separation-reunion tests, storytelling, doll-play tasks, and even questionnaires and interviews to be used with older children.

### **Sex differences in attachment**

#### *Infancy and early childhood*

The first decades of attachment research were characterized by the almost complete absence of reported sex differences in attachment security, organization, and style. This was probably due to a prevailing focus on infants and preschool children, who do not present sex differences in attachment, as shown by several meta-analyses (e.g. van Ijzendoorn, 2000). Studies with children as old as 6 years usually find comparable proportions of avoidant and ambivalent children in both sexes (e.g. Moss, Rousseau, Parent, St-Laurent, & Saintonge, 1998). As a consequence, the absence of sex effects in childhood has been taken for granted, to the point that most attachment researchers omit to include sex as a variable in their analyses, and seldom tabulate their data by sex (this is unfortunate, since samples are often small and could possibly hide statistically 'non-significant' effects).

The only exceptions have been a few reports from high-risk samples, where boys were found to be more frequently and/or severely disorganized than girls (Carlson, Cicchetti, Barnett, & Braunwald, 1989; Lyons-Ruth *et al.*, 1999). More recently, David and Lyons-Ruth (2005) reconsidered the sex differences in disorganization in the light of the biological hypothesis by Taylor *et al.* (2000) of a sexually dimorphic response to stress and threat ('tend-and-befriend' vs. 'fight-or-flight'). They found that female infants were more likely than males to approach their mother when she showed frightening behaviours; in contrast, males (especially at high levels of stress) were more prone to conflicted and aggressive reactions. This finding suggests that the behavioural cues usually employed to diagnose disorganized attachment may underestimate its severity in females.

Finally, indications of small sex-related effects came from the meta-analysis by van Ijzendoorn (2000), who found that same-sex siblings were slightly more likely to be both secure or both insecure, compared with mixed-sex pairs.

*Adolescence and adulthood*

When examining sex differences in adult attachment, the issue of measurement methods (interviews vs. questionnaires) becomes crucial. The first surveys of adult attachment styles were based on interviews like the Adult Attachment Interview, and consistently failed to reveal any sex difference (e.g. van Ijzendoorn & Bakermans-Kranenburg, 1996). The same seemed to happen, at first, with questionnaire-based measures: indeed, most early studies failed to find significant sex differences in styles of romantic attachment (e.g. Collins & Read, 1990; Feeney & Noller, 1990; Hazan & Shaver, 1987). However, early self-report attachment measures had a categorical response format and very low reliability (Baldwin & Fehr, 1995). Newer studies, employing continuous ratings, soon began to find sex effects on attachment self-reports: notably, men (on average) rate themselves as more dismissing (avoidant) than women (e.g. Bartholomew & Horowitz, 1991; Brennan, Clark, & Shaver, 1998; Kirkpatrick, 1998; Scharfe & Bartholomew, 1994), and this pattern is seen cross-culturally (Schmitt *et al.*, 2003). However, not all questionnaire studies found sex differences (e.g. Gentzler & Kerns, 2004; Jang, Smith, & Levine, 2002). For discussion on the scope, merits, and limitations of questionnaires and interviews, see, for example, Belsky (2002), George and West (1999), and Shaver and Mikulincer (2002).

*Middle and late childhood*

One of the limitations of current attachment research is the dearth of studies in middle and late childhood compared with those in infancy and adulthood (Kerns, Tomich, Aspelmeier, & Contreras, 2000; Kerns *et al.*, 2004). This applies to longitudinal research as well, considering that Fraley (2002), in the largest published meta-analysis on attachment stability, could include only four studies in the range from 1 to 6 years, and *none* addressing change between 6 and 16 years. The reason is that practical measures of attachment in school-age children have been developed only recently; in particular, a host of procedures using doll-play story-completion tasks is now available.

A database search was performed by the present author for published papers measuring attachment in middle childhood; of the retrieved studies, only five satisfied the following requirements: (1) the measure employed allowed for coding of avoidance/ambivalence, in addition to security and (2) data were analysed or displayed separately by sex (note that, in most studies, sex was not taken into account at all). Fortunately, the relevant studies are based on relatively large samples; remarkably, all but one supports the existence of consistent sex differences in the avoidance/ambivalence dimension.

The first cues that attachment styles in middle childhood are related to sex come from three studies using a questionnaire on attachment behaviour, the Coping Styles Questionnaire (CSQ). The original study by Finnegan, Hodges, and Perry (1996) was performed in the United States with a sample of 229 children aged 8–13. Boys reported significantly higher scores of avoidant coping, while girls reported more preoccupied (ambivalent) coping. The authors noted this association and attributed it to gender stereotypes.

These results were replicated in a Canadian study by Karavasilis, Doyle, and Markiewicz (2003), who investigated the relation between parenting and attachment to mother in a sample of 202 children aged 9–11. At the CSQ, boys reported more avoidant coping while girls reported more preoccupied coping; both associations were statistically significant.

Third, Corby (2006) administered an expanded version of the CSQ to 199 US children aged 8–14 (mean age: 11). Again, she found significantly higher avoidance scores in boys and higher ambivalence scores in girls.

The fourth study was performed in Israel by Granot and Mayseless (2001) on 113 children aged 9–11. In this study, researchers employed a doll-play procedure adapted from the Doll Story Completion Task (Bretherton, Ridgeway, & Cassidy, 1990), and focused on the relationship between attachment and school adjustment. Results showed unanticipated, striking sex differences: boys and girls differed significantly in their prevailing insecure patterns, with insecure girls classified as more often ambivalent than avoidant, and *all* insecure boys classified as avoidant. This result was briefly noted by the authors, but not discussed further.

Finally, in a recent study, Kerns, Abraham, and Schlegelmilch (2007) administered the same doll-play procedure to a sample of 52 US children aged 9–11 (K. A. Kerns, personal communication, December 2007). In this study, females were more likely to be classified as avoidant than ambivalent (35% A vs. 4% C); the same was true of males, to a lesser degree (19% A vs. 4% C). Boys were more often classified as disorganized (42% of boys vs. 4% of girls). This is the only study which departed from the overall pattern, at least for avoidant attachment; note however that sample size was comparatively smaller than that of the other studies.

In synthesis, there is consistent evidence that, in middle childhood, the distribution of insecure attachment patterns becomes sex-biased, with more avoidant (A) males and more ambivalent (C) females, respectively. So far, this finding holds across methods (questionnaires and doll play) and cultures. Since the stability of attachment *security* is estimated to be more or less constant from 1 year to adulthood (Fraleigh, 2002), this would seem to imply a sex-biased ‘shift’ among insecure children, with some avoidant females becoming ambivalent, and the reverse happening to males. It is quite possible that sex differences in attachment patterns in middle childhood anticipate those found in adult questionnaires; if so, romantic attachment styles in adults would indeed turn out to have a developmental antecedent, which so far was deemed to be lacking (Belsky, 2002).

## Method

This and the next section will present new data from a middle childhood sample, collected in Italy in the context of a research programme on children’s emotional development. Attachment measures were administered during an ongoing project carried out with Dr. Livia Colle (Center for Cognitive Science, University of Turin).

### Participants

Participants were  $N = 122$  children, 71 girls and 51 boys, aged 6 years 9 months to 7 years 6 months ( $M = 7.2$  years,  $SD = 3.1$  months). Children were recruited from three public schools in northern Italy and were selected solely on the basis of age. Parents signed a consent form for testing and videotaping; all data were recorded anonymously using a numerical code scheme. The initial sample comprised 130 children; eight children were selected out before testing because either they had a history of cognitive impairment or they had experienced divorce or death of a parent during the last 6 months. The latter criterion was decided to avoid overly distressing the child during the assessment procedure. The sample is a low-risk one, since the majority of children in the three schools came from middle-class families.

**Material and procedure**

Attachment patterns were rated using the Manchester Child Attachment Story Task (MCAST; Green, Stanley, Smith, & Goldwyn, 2000). The MCAST is a story-completion task composed of one warm-up vignette and four test vignettes, representing situations of separation and distress, designed to elicit attachment representations from the child. The four vignettes' content is as follows: (1) in the night, the child has a nightmare; (2) the child hurts his/her knee while playing in the yard; (3) the child has a tummy ache; and (4) the child loses him/herself in a big mall while shopping with the caregiver.

The task takes about 15–45 minutes to administer; administration is videotaped and the taped session is used for scoring. Material consists in a doll's house and two dolls, representing the child and the mother. The administrator introduces each standardized vignette with the dolls, then lets the child complete the story as he/she wishes.

Scores are attributed to the following dimensions: represented doll behaviour, child behaviour, expressed and described emotions, and narrative coherence. An overall attachment category is then assigned to the child based on the predominant strategy represented in the four vignettes. In addition to the categorical classification, each child also receives a continuous (0–9) disorganization score. In the next paragraphs, I briefly outline the classification criteria for the four main attachment categories.

*Secure attachment (B)*

Secure stories show an effective interpersonal transaction between child and caregiver. The child asks for help and comfort, and the caregiver responds quickly and appropriately to the child's needs. The result is a prompt resolution of distress, with the child returning to exploratory activities (e.g. relaxed play). The caregiver is represented as warm and sensitive, but not overly controlling. The story is coherent, with appropriate emotions and a clear ending. *Note:* the 'secure' MCAST category actually includes four subclassifications. 'Very secure' children are those who closely match the prototype, displaying optimal parental behaviour and quick resolution of distress. 'Secure/avoidant' and 'secure/ambivalent' children represent a basically secure strategy, with minor elements of insecurity. There is also a 'secure/other' subclassification for dubious cases.

*Avoidant attachment (A)*

Avoidant stories show non-interpersonal ways of resolving distress, either by self-care (e.g. going to the hospital alone) or by displacement (e.g. watching TV, cleaning the house, denying the distressing event). The caregiver is not represented, or represented as cold and rejecting. Interaction can be minimal and is ineffective in resolving distress.

*Ambivalent attachment (C)*

Ambivalent stories represent interpersonal transactions with the caregiver that are *not* effective in resolving distress, actually increasing or maintaining it, and typically involve high levels of anger and reciprocal control. The child often introduces new elements of distress (e.g. after medication of the hurt knee, the child goes playing but then hurts his/her head, and so on), and the story may never reach a clear ending.

*Disorganized attachment (D)*

In disorganized stories, the attachment strategy is incoherent and ineffective in calming distress. There may be complete lack of a recognizable strategy or rapid alternation of incompatible strategies. Most of the times, stories are characterized by narrative/behavioural 'lapses' (e.g. freezing, trance-like states, interrupted sequences) and intrusion of bizarre, frightening, or overly aggressive content.

*Coding of MCAST protocols*

All videotaped sessions were scored by the author, who is a reliable MCAST coder. Seventeen videos (14% of the sample), randomly selected, were cross-rated by one of three reliable coders: Dr. Jonathan Green (University of Manchester, developer of the MCAST), Barbara Actis (University of Turin), and Dr. Francesca Manaresi (ARPAS, Rome). The raw inter-coder agreement on four-way categories was 88% (Cohen's  $\kappa = .81$ ;  $p < .001$ ).

Coding was blind to the hypothesis of the present paper. Attachment ratings were collected during a study on children's emotional competence to test a different set of predictions, and the sex differences in attachment were unanticipated at the time when protocols were scored.

**Results*****Avoidant versus ambivalent attachment***

As shown in Table 1, there were clear-cut sex differences in the distribution of A versus C attachment patterns. While the proportions of secure and disorganized children were almost exactly the same for boys and girls (55% vs. 54% and 16% vs. 17%, respectively), only one boy in the sample could be classified as ambivalent (2%), compared with 25% of the girls. Conversely, 27% of the boys were avoidant compared with only 4% of the girls. The overall comparison was statistically significant  $\chi^2(3) = 22.00$ ,  $p < .001$ , as were the differences in the proportion of both ambivalent (Fisher's exact test:  $p = .001$ ) and avoidant ( $p = .002$ ) patterns.

**Table 1.** Frequency distribution of four-way attachment patterns

	Attachment patterns				Total
	A	B	C	D	
Males	14 (27%)	28 (55%)	1 (2%)	8 (16%)	51
Females	3 (4%)	38 (54%)	18 (25%)	12 (17%)	71
Total	17 (14%)	66 (54%)	19 (16%)	20 (16%)	122

***Secure subtypes***

As described in the methods section, the MCAST coding system allows for a finer level of detail in attachment classification; in particular, four *secure subtypes* can be scored. The distribution of secure subtypes in the sample is shown in Table 2. Interestingly, the sex difference in avoidance versus ambivalence was also apparent at the level of secure subclassifications, even if not as dramatically as for insecure patterns.

In particular, 21% of secure boys could be classified as secure/ambivalent, which is a high proportion if compared to the virtual absence of insecure-ambivalent boys. The overall comparison between males and females was nearly significant:  $\chi^2(3) = 7.51, p = .057$ .

**Table 2.** Frequency distribution of secure subtypes

	Attachment patterns				Total
	B	B/A	B/C	B/nc	
Males	6 (21%)	13 (46%)	6 (21%)	3 (11%)	28
Females	12 (32%)	6 (16%)	12 (32%)	8 (21%)	38
Total	18 (27%)	19 (29%)	18 (27%)	11 (17%)	66

Key: B, very secure; B/A, secure/avoidant; B/C, secure/ambivalent; B/nc, secure/not classified.

### Attachment disorganization

Previous research (see above) found that males tend to be classified more often as disorganized and/or tend to show more severe degrees of disorganized behaviour. The proportion of disorganized children in our sample did not differ between boys and girls: proportions test,  $Z = 0.18, p = .858$  (two-tailed).

Even if the *frequency* of disorganized classifications is the same for males and females, it is still possible that disorganization *levels* differ to some degree. Boys and girls were then compared on their continuous disorganization score, which rates the severity of disorganized behaviours on a 9-point scale. Since avoidant and ambivalent patterns are extremely sex-unbalanced, comparison were made between (1) disorganized boys versus girls and (2) secure boys versus girls. The comparisons were statistically significant, showing that boys are rated as more severely disorganized, both at high levels (D boys:  $M = 5.9, SD = 1.5$  vs. D girls:  $M = 4.7, SD = 0.6; t(18) = 2.87, p = .010$ ) and low levels of disorganization (B boys:  $M = 1.3, SD = 1.2$  vs. B girls:  $M = 0.7, SD = 1.1; t(64) = 2.12, p = .038$ . All tests are two-tailed).

### Discussion

The data showed a marked association between sex and specific insecure patterns of attachment. The effect was especially strong in males, where the ambivalent pattern was virtually absent. A similar distribution was found when analysing the secure subtypes, although the effect was weaker. In addition, the data confirmed previous observations of higher disorganization in males. While the proportion of categorical D attachment did not differ between sexes, continuous ratings of disorganization severity did; this result suggests that sex differences in disorganization may persist well beyond infancy.

It is especially interesting to compare the present results with those from the Israeli sample by Granot and Mayseless (2001). This study employed a similar assessment method, a revised version of the Doll Story Completion Task (Bretherton *et al.*, 1990). The coding scheme for ABCD attachment patterns was also very similar to that of the MCAST. One of the main differences between MCAST and the Granot and Mayseless (2001) task is that, in the latter, stories include both parents, while the MCAST is designed to represent only one caregiver (the mother in the present case).

Despite obvious differences in cultural background, the sex-related effect on the distribution of insecure attachment patterns in the Israeli study was very similar to that observed in Italy. Actually, the two distributions were nearly identical for males: the proportion of avoidant males was 27% in both samples, while ambivalent males were 2% in Italy and 0% in Israel. As for females, there were similar proportions of avoidant (4% and 7%) and ambivalent (25% and 18%) classifications in Italy and Israel, respectively.

It is important to note that the two samples differed not only in culture of origin but also in age, with the Israeli children being older (9–11 years) than the Italian ones (7 years). Of course, more research is needed to fully establish the developmental course of attachment from middle childhood to adolescence. If the data presented here proved representative of a general trend, they would mean that by age 7 the sex differences in attachment are already well established. Since investigators have not reported sex differences even in 6-year-old samples, it is possible that sex-biasing of attachment patterns involves a rapid shift at about 6–7 years. It is also possible, however, that change is more gradual and previous studies failed to report smaller sex differences because of limited statistical power; only a detailed meta-analytic approach is likely to clarify the issue. In the meantime, attachment researchers should begin to report and analyse sex in their studies on a routine basis. The absence of sex effects in childhood cannot be longer assumed, and future meta-analyses will surely benefit from a greater amount of published data (including ‘non-significant’ ones).

What are the causes and reasons of sex differences in attachment? And specifically, why do such differences show up in middle childhood? While space constraints forbid any attempt at a full discussion (see Del Giudice, 2008, for a thorough theoretical treatment), some preliminary points can be sketched. In a biological perspective, the attachment motivational system has a double role: securing care and protection in early development, and providing a basis for reproductive bonding later in life. Whereas adult couple relationships obviously involve more than attachment, their neurobiological substrate and behavioural dynamics overlap strikingly with those regulating early caregiving (Carter, 1998; Feeney, 1999; Hazan & Zeifman, 1999; Insel & Young, 2001; Leckman *et al.*, 2005; Panksepp, 1998; Pedersen *et al.*, 2005). In an evolutionary framework, it can be expected that in adulthood (but not in childhood) sexual selection would favour sex differences in the dynamics of bond formation represented by romantic attachment styles, with males more often oriented towards low-investment and short-term relational strategies (e.g. avoidance) than females (for an overview see Andersson, 1994; Geary, 2002).

In this perspective, middle childhood would mark the transition between two distinct phases in the development and function of the attachment system (an early phase oriented to parent–child relationship and a mature phase oriented to couple relationships), thus leading to a partial reorganization of attachment patterns. Often virtually ignored by developmental researchers, middle childhood is in fact a period of fast psychological change, and is endocrinally characterized by the so-called ‘adrenal puberty’, or *adrenarche* (see Auchus & Rainey, 2004; Ibanez, Dimartino-Nardi, Potau, & Saenger, 2000; Palmert *et al.*, 2001; Spear, 2000). Adrenarche involves secretion of androgen precursors in both sexes, and can activate sexual differentiation of the nervous system; McClintock and Herdt (1996; Herdt & McClintock, 2000) consider adrenarche to be responsible for the onset of the first sexual/romantic attractions, usually happening at about 7–9 years of age. Thus, it appears that middle childhood is an important biological landmark, when the organism begins to reorganize its behaviour in view of future reproduction (even before achieving sexual maturity). While cultural

factors and gender roles may certainly have a role in producing the observed sex differences in attachment, the above arguments, together with the strong cross-cultural results by Schmitt *et al.* (2003), suggest a likely biological basis for the effect. Placing sex differences in a broader evolutionary perspective will prove essential to gain an integrated understanding of the function of attachment over an individual's life course.

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