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A Meta-Analytic Review of Gender Variations in Children's Language Use: Talkativeness, Affiliative Speech, and Assertive Speech

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Three sets of meta-analyses examined gender effects on children's language use. Each set of analyses considered an aspect of speech that is considered to be gender typed: talkativeness, affiliative speech, and assertive speech. Statistically significant average effect sizes were obtained with all three language constructs. On average, girls were slightly more talkative and used more affiliative speech than did boys, whereas boys used more assertive speech than did girls. However, the average effect sizes were either negligible (talkativeness, $d = 0.11$; assertive speech, $d = 0.11$) or small (affiliative speech, $d = 0.26$). Larger effect sizes were indicated for some language constructs depending on either the operational definition of the language measure, the method of recording, the child's age level, the interaction partner (adult or peer), group size, gender composition, observational setting, or type of activity. The results are interpreted in relation to social-developmental and social-constructionist approaches to gender; these views are presented as complementary—rather than competing—meta-theoretical viewpoints.

Language is a powerful tool for transmitting and expressing gender-related cultural practices in society (Crawford, 1995). The relation between language and gender during childhood has been addressed in popular books (e.g, Tannen, 1990) as well as scholarly publications in developmental psychology (Leaper, 1991, 1994; Maccoby, 1998), education (Swann, 1992), communication (J. T. Wood, 2001), and anthropology (Maltz & Borker, 1982). In general, the research literature suggests that girls are more likely than boys to use language to form and maintain connections with others, whereas boys are more likely to use language to assert their independence and to achieve utilitarian goals. Although the pattern of gender differences in the use of language tends to be consistent when differences are reported, many studies find no significant differences. Questions also remain regarding the magnitude of average gender differences in language use at different ages as well as the social conditions that moderate the likelihood of average differences. Meta-analysis is a potentially useful procedure for addressing these types of questions. Furthermore, the findings from meta-analyses can guide theory development (a topic addressed later). Accordingly, in the present article, we report three sets of meta-analyses that tested for average gender differences in talkativeness, affiliative speech, and assertive speech, as well as for the influences of various moderators.

Gender Differences in Language Use: Talkativeness, Affiliative Speech, and Assertive Speech

Talkativeness, affiliative speech, and assertive speech are three pragmatic aspects of children's use of language that we investigated. Talkativeness can serve as a broad index of children's general communicative competence (e.g., Gallagher, 1993). However, the pragmatics (i.e., social functions) of language are expressed more specifically through particular speech acts (J. L. Austin, 1962). For the purposes of the present review, a distinction is made between *affiliative* and *self-assertive* speech acts (Leaper, 1991, 2000a).[1] The affiliative function refers to language used to establish or maintain connections with others. Examples include statements that show support or elaborate upon the other person's prior remarks. The self-assertive function refers to language that is used to influence others. Examples include directive statements or disagreements. Both types of communication are related to children's developing social competence (e.g., Burleson, Applegate, Burke, & Clark, 1986). Moreover, the ability to coordinate the use of self-assertive and affiliative communication functions is generally viewed as the hallmark of the highest levels of psychosocial competence (see Selman, 1989).

The distinction between affiliation and assertion is also useful for understanding the ways that language is used to create and maintain gender divisions in society. Narrative reviews of the

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[1] Other authors have described affiliative and assertive interpersonal behavior using a variety of terms. Some notable examples include *task-oriented* and *socioemotional* activity (Bales, 1970), *instrumental* and *expressive* behavior (Parsons & Bales, 1955), *agency* and *communion* (Bakan, 1966), and *power* and *affiliation* (Wiggins, 1979), respectively. Assertion and affiliation are not mutually exclusive psychological acts, and they can be viewed as separate dimensions (see Leaper, 1991, 1994, 2000a; Leaper, Tenenbaum, & Shaffer, 1999). A speech act may be both assertive and affiliative when it is collaborative. Examples include suggestions for joint activity ("Let's go for a walk") or elaborating in relevant ways on the other speaker's topic (Leaper, 1991).

research literature (e.g., Leaper, 1994; Maccoby, 1998; Maltz & Borker, 1982) suggest that girls are more likely than boys to use language to make connections with others. This may include greater talkativeness and the frequent use of affiliative speech acts. In contrast, boys appear more likely than girls to use assertive language to establish dominance or to achieve utilitarian goals. Gender-related variations in children's use of language are reviewed below. After this synopsis, we consider possible explanations for gender differences in language use.

Talkativeness

One popular stereotype in America is that women are more talkative than men (see James & Drakich, 1993). The stereotype reflects the traditional image of women and girls as expressive and affiliative in contrast to the traditional view of men and boys as stoic and independent. This assumption has received some support from two meta-analyses. First, in their meta-analysis of gender effects on verbal ability across the life span, Hyde and Linn (1988) reported a small effect size ($d = 0.33$) favoring females over males in tests of verbal production. Most of the studies included in their meta-analysis relied on formal tests of language performance and ability rather than on observations of actual conversations. In addition, these authors did not consider possible contextual moderators of gender differences in verbal production.

In their meta-analysis of parents' speech to their children, Leaper, Anderson, and Sanders (1998) provided additional evidence for an average gender difference in talkativeness. They found that mothers were more talkative than fathers when interacting with children. These authors examined aspects of the interactive context as possible moderators; they found that the type of activity moderated the likelihood of gender differences in talkativeness, with differences being greater during unstructured activities than during structured activities. In the present study, we hypothesized that gender differences in talkativeness during childhood would be similar to those reported among adults. Specifically, we anticipated that girls would be more talkative than boys but that the gender difference would be influenced by various moderators (reviewed later).

Affiliative and Assertive Speech Acts

In addition to differences in the amount of language spoken, researchers have described gender differences in the uses of affiliative and assertive speech acts. Examples of affiliative language include showing support, expressing agreement, or acknowledging the other's contributions. Types of assertive language include directive statements, criticism, or giving information. Gender differences in the uses of affiliative and assertive language functions have been interpreted as manifestations of traditional gender divisions in society (e.g., Graddol & Swann, 1989). Men's dominant status in society and their task orientation are enacted and maintained through the use of self-assertive language strategies such as directive and instrumental speech. Conversely, women's relatively subordinate status as well as their traditional role as caregivers are expressed through the use of affiliative language strategies such as showing support and agreement. These average gender differences are seen in childhood as well as adulthood (see Leaper, 1994; Maltz & Borker, 1982).

Gender-related variations in affiliative and assertive speech have been described in prior narrative reviews of adults' language use (e.g., Aries, 1996). Also, in Leaper et al.'s (1998) meta-analysis, mothers were found to use more affiliative speech and less assertive speech than were fathers. However, there has not been a corresponding meta-analytic review testing for gender differences in *children's* language use. Nor has there been any systematic analysis of the factors that may moderate the likelihood and the magnitude of any gender differences in child language use. Of particular note is that an increasing number of reviewers have highlighted the role of situational factors as moderating influences on the incidence and the magnitude of gender differences in adults' social interaction (e.g., Aries, 1996, 1998; Deaux & Major, 1987; Eagly, 1987; Leaper et al., 1998; Ridgeway & Smith-Lovin, 1999). To help frame some of the specific moderators, we review theoretical explanations for gender-related variations in social behavior next.

Interpreting Gender-Related Variations in Children's Language Use

Three broad types of explanation for gender differences in behavioral development are popularly invoked: biological, social-constructionist, and social-developmental. These are meta-theoretical paradigms that guide how researchers think about gender development. The *biological* explanation calls attention to sex differences in brain organization and functioning. With regard to the three language constructs currently under review, the biological explanation may be pertinent when considering average gender differences in talkativeness. Girls tend to develop language earlier than do boys (see Gleason & Ely, 2002). Also, girls score higher than boys on measures of verbal production (see Hyde & Linn, 1988). Although sex-related biological influences on language development are likely, social factors are believed to account for a larger amount of the variance in language use (see Gleason & Ely, 2002, for a review). Furthermore, most researchers who emphasize the influence of biological factors also acknowledge that social factors can mitigate or exaggerate biological predispositions (see Halpern, 2000).

The second type of explanation, the *social-constructionist* perspective, emphasizes the situational demands of the immediate context as well as the indirect influences of the larger sociocultural context. Gender is not interpreted as a fixed, static entity but rather as something that is fluid, enacted, and contextually situated (see Kimmel, 2004; West & Zimmerman, 1987). In Kimmel's (2004, p. 94) words, "When we say that gender identity is socially constructed, what we mean is that our identities are a fluid assemblage of the meanings and behaviors that we construct from the values, images, and prescriptions we find in the world around us. Our gendered identities are both voluntary—we choose to become who we are—and coerced—we are pressured, forced, sanctioned . . . into submission to some rules." Accordingly, the social-constructionist perspective places great emphasis on structural power in relationships and institutions.

Researchers who take a social-constructionist approach have highlighted several aspects of the social-interactive and cultural contexts that influence gender-related variations in social behavior. First, gender differences in communication style can result from girls' and boys' participation in different activities (e.g., Huston,

1985; Leaper, 1994). For example, girls' gender-typed domestic fantasy play is likely to involve collaborative conversations emphasizing affiliative speech, whereas boys' gender-typed construction play is likely to involve task-oriented communication emphasizing assertive speech (see Leaper, 2000a). Second, peers regularly exert social pressures on one another to act in gender-typed ways (e.g., Fagot, 1977). For example, girls may feel pressure to act nice, whereas boys may experience an expectation to act tough (see Leaper, 1994). Whether children act nice or tough shapes how they use language (Maltz & Borker, 1982). Finally, those taking a social-constructionist approach point to men's (and possibly boys') greater status and power in society as a source for gendered social relations. Studies of adults suggest that gender often acts as a status characteristic among strangers, with men being afforded greater privilege and authority than women (e.g., W. Wood & Karten, 1986). However, the possible relevance of structural dominance to gender differences in children's speech has received little attention (for some exceptions, see Kyratzis, 2001; Leaper, 1994, 2000b; Thorne, 1993). Across all of these situational influences, an underlying assumption of the social-constructionist view is that girls and boys will act in similar ways if they are placed in similar circumstances with equal status.

Finally, the *social-developmental* approach stresses the influence of cognitive learning and experience over time (for reviews, see Bussey & Bandura, 1999; Liben & Bigler, 2002; Martin, Ruble, & Szkrybalo, 2002). For example, gender schema theory emphasizes the importance of forming a gender concept in guiding one's self-definition (Bigler, 1995; Liben & Bigler, 2002; Martin & Ruble, 2004; Martin et al., 2002). Activities, traits, and roles that appear relevant for one's own gender take on more salience and value than those labeled for the other gender (see Liben & Bigler, 2002; Martin & Ruble, 2004). Social cognitive theory additionally points to the importance of having opportunities to practice particular behaviors that foster self-efficacy (Bussey & Bandura, 1999). To the extent that girls and boys are systematically encouraged to participate in different types of activities, they are likely to develop different areas of expertise. Gender-segregated peer groups may play an especially important role in strengthening these trends (Leaper, 1994; Maccoby, 1998). Thus, gender-differentiated experiences are viewed as shaping girls' and boys' developing expectations, preferences, knowledge, and abilities. These differences, in turn, may lead girls and boys to act differently across various situations.

Some feminist sociologists such as Thorne (1990) and Kimmel (2004) have criticized the social-developmental explanation as an essentialist approach for emphasizing how the development of individual differences in self-concept, attitudes, and traits influences later behavior; these critics further argue that the social-developmental approach does not allow for the context-specific nature of many gender-related differences. We disagree. Most contemporary developmental theories address the interplay between personal and situational factors (see Bussey & Bandura, 1999; Martin et al., 2002). Many developmentalists have specifically addressed the role of context during children's gender development. The research clearly shows that situations do create particular demands for particular behaviors. For example, playing with a toy food set calls for a different play script than does playing with construction toys (Leaper, 2000a; Liss, 1983). But if girls and boys are systematically exposed to different contexts over time, this fact creates different opportunities that will affect children's developing expectations and abilities. Thus, contextually mediated gender differences can develop into individual differences in attitudes and behavioral tendencies (see Leaper, 2000b).

Whereas contemporary theories of gender development, such as gender schema theory or social cognitive theory, do acknowledge the importance of context in social development, there is no theory that has outlined in *an explicit and detailed manner* how these influences are interrelated.[2] We have a lot to learn about how socialized gender differences are affected by particular contexts. At the same time, we need to know more about how girls' and boys' responses to specific situational demands are shaped by their prior socialization (e.g., see Eccles, Freedman-Doan, Frome, Jacobs, & Yoon, 2000; Huston, Carpenter, Atwater, & Johnson, 1986). One goal of our meta-analyses was to consider some of the relative influences of contextual and developmental influences. For the purposes of the present article, we used the social-developmental and the social-constructionist paradigms to generate particular hypotheses regarding the manifestation of gender-related differences in language use. In particular, the social-developmental explanation places relatively more emphasis on the influences of children's understandings and practiced behaviors, whereas the social-constructionist explanation focuses on the situational demands of the current sociocultural context (especially in relation to status and power). Accordingly, we refer to social-developmental and social-constructionist *approaches*—rather than to particular theories that may or may not address both individual and contextual influences.

The Social-Interactive Context

The studies included in the meta-analyses looked at children's interactions with either peers or adults (usually parents). We examined average effect sizes and tested moderators across all types of interaction partners. Also, we tested for moderators separately with child–adult and child–peer samples. There are theoretical and practical reasons to test gender differences and moderators separately for child–adult interactions and for child–peer interactions. Hartup (1989) referred to adult–child interactions as vertical relationships because one partner (the adult) has more social power than the other (the child). In contrast, peer interactions constitute horizontal relationships because the partners share similar levels of social power. Children's acquisition of basic social skills occurs within the context of vertical relationships, whereas their development of more complex social skills is more likely to transpire in horizontal relationships (Hartup, 1989). With regard to gender, vertical relationships could be interpreted as contexts for imparting early gender lessons. Peer relations can be viewed as contexts in which gender social norms are enacted and refined. Therefore, when warranted, we carried out separate analyses with only studies of peer interactions and with only studies of child–adult interactions.

According to many scholars, girls and boys constitute two "cultures" whose separate developmental histories establish different social norms and preferences (for reviews, see Leaper, 1994; Maccoby, 1998; Maltz & Borker, 1982). Thus, girls' participation

[2] We thank Rebecca Bigler for highlighting this point.

in dyadic interactions involving cooperative social-dramatic activities is seen as fostering affiliative concerns and behavior. Girls may thus learn to use their words to create and maintain closeness with others through the use of supportive and inclusive types of speech. Conversely, boys' participation in group interactions emphasizing competitive or instrumental goals are viewed as promoting self-assertive interests and behaviors. Boys may thereby learn to assert their position of dominance in relation to others through the use of commands and challenging statements.

Whereas girls' and boys' peer groups may tend to emphasize different social norms, a criticism of the "two cultures" interpretation is that it ignores the larger social-structural forces in which gender relations are situated (Henley & Kramarae, 1991; Kimmel, 2004). First, the different social norms associated with girls' and boys' peer groups may both reflect and perpetuate gender asymmetries in power and status (see Leaper, 2000b). Also, some gender differences in social behavior may depend less on underlying differences in social norms and more on the power and status dynamics between the sexes in particular interactions (Carli, 1990; W. Wood & Karten, 1986). Carli (1990) argued that the relative influence of social norms versus status and power can be inferred by comparing the likelihood of gender differences during same- and mixed-gender interactions: If gender differences in language use reflect underlying gender differences in social norms or preferences, then behavioral differences should be most likely when children interact with other children who share similar norms or preferences—that is, with same-gender peers. By way of contrast, proponents of the social-constructionist explanation point to individuals' relative status and power as important. Accordingly, if gender acts as a status characteristic (as opposed to reflecting different social norms), gender differences in social behavior should be most likely when the presumed status difference would be most salient—that is, during mixed-gender interactions (see Carli, 1990).

Carli (1990) compared the social norms (i.e., socialization) and the status and power (i.e., social constructionist) explanations as testable hypotheses of gender differences in adults' language use. She found support for both explanations depending on the language measure examined. The social status and power explanation was supported for observed gender differences in assertive speech. Women were less assertive than men in mixed-gender pairs but not in same-gender pairs. In contrast, women used more supportive speech than did men but only when interacting with same-gender partners. Carli interpreted her findings to suggest that adult gender differences in assertive speech may depend more on status and power differences (i.e., aspects of the situation), whereas adult gender differences in affiliative speech may depend more on social norms (i.e., the cumulative impact of socialization). We do not know how strongly gender might act as a status characteristic among children and if the same patterns that Carli proposed might apply. The meta-analyses may suggest some answers.

Additional aspects of the interactive context were considered as possible moderators. According to Deaux and Major's (1987) contextual model, the salience of gender is greater in situations when the participants' concerns for self-presentation are heightened—particularly in ambiguous social settings. In uncertain social situations, gender becomes a readily available (and well-practiced) schema for guiding people's expectations (Deaux & Major, 1987; W. Wood & Karten, 1986). To consider the premises of Deaux and Major's model, we tested the familiarity between the participants as well as the familiarity of the observational setting. Studies of gender-related variations in children's social behavior tend to examine interactions either between friends or between strangers. Also, these studies tend to occur either in naturalistic settings or in laboratories. Accordingly, we hypothesized that gender differences would be more likely when children were observed with strangers (compared with familiar partners) and in unfamiliar (compared with naturalistic) settings.

Another factor we considered was the number of interaction partners with whom the child was observed. In particular, we contrasted dyadic versus group (three or more persons) interactions. "In dyadic relationships, children learn how to behave with [specific individuals]. In the peer group they learn how to behave in public" (J. Harris, 1995, p. 476). Thus, gender may be more salient in larger groups as peer norms become more prominent. Hence, gender differences were hypothesized to be more likely in group settings than in dyadic settings.

Finally, according to the social-constructionist view, what children are *doing* should matter. Many gender-related variations in children's behavior may be mediated by the type of activity in which they are engaged (Carpenter, 1983; Etaugh, 1983; Huston, 1985; Liss, 1983). This mediation was seen when Leaper (2000a) observed children playing separately with both a feminine-stereotyped toy set (toy foods and plates) and a masculine-stereotyped toy set (toy track and cars). Both girls and boys demonstrated significantly more affiliative behavior during the feminine-stereotyped activity than during the masculine-stereotyped activity. With the activity controlled, however, there was no gender difference in their affiliative behavior. Also, in their meta-analysis of parents' speech to their children, Leaper et al. (1998) indicated that gender differences were more likely in unstructured settings, where the parent and child could select the activity, than in structured settings, where a particular activity or toy was assigned. Thus, we hypothesized that gender differences in language use would be more likely in studies that observed children in unstructured than in structured activities.

Developmental Changes

Social factors may explain how and why gender-related variations in social behavior occur. The impact of any social influence, however, will depend on the developmental level of the child. First, the cultural messages about gender are different for a 5-year-old than they are for a 15-year-old. Whereas a preschooler may be learning the play activities considered gender typical, an adolescent may be considering the types of academic subjects or sexual roles that are viewed as acceptable for her or his gender. Moreover, a 5-year-old processes information about the world differently than a 15-year-old does. Thinking about gender is more concrete and rigid for a preschooler; in contrast, an adolescent can appreciate that gender roles are social conventions that are subject to change (Katz & Ksansnak, 1994; Stoddart & Turiel, 1985). Given the many changes in gender understanding and gender-related social relations that transpire from the toddler years into adolescence, age is of particular relevance in our consideration of gender differences in language use. For the purposes of the present analyses, we considered the following age levels: Early childhood (2 to 5 years of age) is a period when children are first acquiring gender-related

concepts, stereotypes, and preferences. Middle childhood (6 to 10 years) is a period following the consolidation of gender typing; during this period, gender-segregated peer grouping is pervasive, yet children's gender stereotyping may be somewhat less rigid than during early childhood. Preadolescence (10 to 12 years) and adolescence (13 to 18 years) are years of possible gender intensification as pressures increase to adopt culturally dominant adult sexual and occupational roles.

In general, children become more flexible in their attitudes about gender between early and middle childhood (Katz & Ksansnak, 1994; Liben & Bigler, 2002; Stoddart & Turiel, 1985). Between middle childhood and adolescence, however, there are two suggestions about their gender attitudes in the research literature. According to some research, increases in flexibility continue into adolescence both in gender attitudes and personal preferences (Katz & Ksansnak, 1994; Liben & Bigler, 2002; Serbin, Powlishta, & Gulko, 1993). Alternatively, other researchers suggest increasing rigidity during the adolescent transition (Archer, 1984; Galambos, Almeida, & Petersen, 1990; Hill & Lynch, 1983; Stoddart & Turiel, 1985). Increased rigidity at adolescence is known as the gender-intensification hypothesis (Hill & Lynch, 1983; also see Archer, 1984), which proposes that adolescents' options may become more restricted as they encounter gender-typed pressures for occupational achievement and sexual attractiveness. Also, the emergence of conventional thinking may lead adolescents to see gender roles as shared social norms requiring conformity (Stoddart & Turiel, 1985).

Still another age-related pattern may be that gender differences in communication style will follow a linear increase from early childhood into adolescence. Although children's gender-related cognitions may become more flexible as they move from early to middle childhood, it is possible that these changes are not reflected in their actual behavior (see Liben & Bigler, 2002). For example, some girls may come to believe that it is acceptable for girls to play sports while showing no increased interest in sports themselves. As children continue to practice gender-typed behaviors, their attitudes may become more entrenched (see Leaper, 2000b). That is, expectations become reinforced while certain behaviors are practiced and others are avoided. Thus, by testing age as a moderator in the meta-analyses, we were able to consider three possible developmental patterns: (a) increasing flexibility (i.e., increasing gender similarity) from childhood through adolescence, (b) increasing flexibility (i.e., increasing gender similarity) until adolescence followed by increasing rigidity (i.e., increasing gender difference), or (c) increasing rigidity (i.e., increasing gender difference) from childhood through adolescence.

Methodological Moderators

In addition to testing contextual and developmental factors as possible moderators, meta-analysis can take into account methodological characteristics. As emphasized in research methods textbooks (e.g., Bordens & Abbott, 2002), whether or not an investigator detects a statistically significant relation between variables may depend on how the study was carried out. The methodological qualities that we examined included the operational definition of the language construct, measurement interdependence, the method of behavioral recording, the length of observation, the first author's gender, the publication quality, and the year of the study.

With regard to the operational definition, it is possible that gender differences may be more or less likely depending on how an investigator defined talkativeness, affiliative speech, and assertive speech. Measures of talkativeness range from counts of total words and rate of talking per unit of time (thereby emphasizing verbosity) to mean length of utterance (thereby emphasizing verbal complexity). With affiliative and assertive language, some researchers measure very specific types of affiliative and assertive speech (e.g., agreements and directives, respectively), whereas others use very general definitions that encompass several categories.

There are other variations in specific types of affiliative and assertive speech. Some forms of affiliative speech are also assertive as, for example, when a person actively shows support for or elaborates on another's comment (see Leaper, 1991). In contrast, other forms of affiliative speech are relatively passive as, for example, when a person obligingly goes along with the other. Next, there are types of assertive speech that are domineering and emphasize the person's power over the other as, for example, in the use of commands. However, other forms of assertion are less controlling, for example, as with many task-oriented speech acts such as giving information or making suggestions (see Leaper, 1991). Thus, it is potentially interesting to see if the likelihood of gender differences depends on the specific type of affiliative or assertive speech.

A second methodological moderator was whether data from more than one individual in a social interaction were analyzed. A challenge to examining social interactions is the interdependence between partners. Some studies handle this problem by randomly selecting one participant in a pair as the target for analysis. Another strategy is to consider the scores of all participants in an interaction. Indeed, almost half of the reviewed studies of peer interactions used measures of language behavior that reflected the behavior of more than one partner in an interaction. The difference between the two approaches may affect the type of results that follow. Moreover, aggregating across studies using different procedures presents a dilemma when performing meta-analyses. We chose to address the matter by comparing independent versus interdependent measures as a factor in the meta-analyses. To our knowledge, this is the first investigation to consider how this methodological choice may affect research findings.

The method of recording children's social interactions may also affect the results one obtains. A distinction was made between audiotape, videotape, and on-site sampling. With videotape, the researcher has the advantage of repeated viewings as well as the ability to take into account the nonverbal context. Audiotape also allows for repeated "viewings," but the nonverbal context is missing. When speech acts are analyzed, the nonverbal context can sometimes help clarify the speaker's intent regarding certain messages (e.g., a smile may indicate that a comment is meant as a joke rather than an insult). Finally, some researchers record behaviors using on-site coding (e.g., time sampling). Although this method saves the time of reviewing and transcribing tapes, it relies on the accurate assessment of behavior at a single viewing. It seems that the use of videotape would be the most reliable method for measuring behavior. However, Fagot and Hagan (1988) offered evidence suggesting that when certain conditions are being observed, such as active play, live observation may be more accurate than videotape. The meta-analysis was intended to help us test

whether either of the recording methods was more reliably associated with larger effect sizes.

In addition to the method of recording, another methodological feature that may influence the reliability as well as the validity of the results is the length of time that behavior is observed. One may expect that consistent patterns of behavior are more likely to be revealed with longer periods of observation (see Fagot, 1985). Therefore, we considered the length of time that social interactions were coded as a moderator.

A few of the other methodological moderators tested for possible researcher or publication biases. One of these factors was first author gender. Some readers may find it surprising that author gender would be considered as a potential moderator. However, prior meta-analyses have sometimes indicated a difference between men and women authors in the reporting of significant gender differences in social behavior (e.g., Eagly & Carli, 1981; Leaper et al., 1998). Publication source is a second potential source of bias. Research journals generally do not publish a set of nonsignificant results—and the pressures are likely greater in top-tier journals than in other sources. Thus, there may be a publication bias toward reporting significant gender differences that inflates the magnitude of an average gender difference (see *The "File Drawer Problem*" in the Method section). A related moderator that was tested was whether or not the study specifically focused on gender as one of its primary research questions. Researchers looking for gender differences may be more biased toward detecting gender differences than those who include gender as an incidental control factor in their analyses.

Finally, year of study was used to explore whether gender differences in language behavior possibly may have changed over the years. There is evidence for increased liberalization of gender attitudes in the United States during the last 20 years (Konrad, Ritchie, Lieb, & Corrigall, 2000; Twenge, 1997). Also, there has been some indication of diminishing child gender differences in certain cognitive abilities over the years (e.g., Hyde, Fennema, & Lamon, 1990). However, we do not know if average gender differences in children's social behavior are declining.

Summary

Two general questions guided the present study: First, to what extent do girls and boys tend to differ in their use of language? As reviewed earlier, many researchers suggest a consistent pattern of average gender differences in language use. However, many other investigators report no significant gender differences. Consequently, there is considerable debate regarding the likelihood and the magnitude of observed gender differences in communication style (and social behavior more broadly). There is also some theoretical debate regarding the types of conditions under which any gender differences are most likely to occur. Accordingly, our second guiding question asked, What types of factors moderate the incidence and magnitude of any observed average gender differences? Several moderator variables were examined as possible influences on the likelihood and the magnitude of gender differences in children's language behavior. They included methodological characteristics and contextual features. To explore these questions, we used separate sets of meta-analyses to test for gender differences in talkativeness, affiliative speech, and assertive speech.

Method

Literature Search

Studies examining gender-related effects on children's language were collected through a variety of sources. Most of the studies were identified through computerized searches of the PsycINFO Database. Studies were also identified from citations in the articles found in these searches. The dates of publication for the collected studies ranged from 1958 to 2000.

Three selection criteria were used: First, only studies that tested for gender effects on children's language behavior were used. Second, only studies using quantitative observational measures were included. Therefore, self-report studies of verbal behaviors—which were rare—were excluded. Also, observer global ratings of perceived communication style were not used. Third, only studies published in either research journals or books were included.

Language Variables

We carried out three meta-analyses to test for average gender effects and moderator influences on children's talkativeness, affiliative speech, and assertive speech. All of the language measures were based on either frequency, proportion, or rate scores. None of the measurements were based on conditional probabilities. In studies of affiliative or assertive language, the typical unit of analysis is the speech act or message unit. For example, Leaper (1991, p. 801) defined message units as "individual speech acts, or utterances, bounded by their intonation contour. These included single sounds, sentence fragments, and complete sentences."

Intercoder reliability was assessed between two researchers for classification of the specific operational definitions for each language variable. The kappa coefficient was .84, which is considered an excellent level of agreement (see Fleiss, 1981). Each language variable is further described below:

Talkativeness

A distinction was made between the following operational definitions of talkativeness: (a) number of words or utterances, (b) duration of talking, (c) mean length of utterance (MLU) or words per turn, (d) rate or time sampling, and (e) miscellaneous definitions (e.g., number of conversational turns). There were 61 published studies identified that tested for gender differences in talkativeness.

Affiliative Speech

Affiliative speech refers to positively responsive language. A distinction was made between the following types of affiliative speech: (a) general measures of affiliative speech, (b) praise, (c) agreement, (d) acknowledgment (including minimal listening responses), (e) responsiveness (e.g., elaborating on the other's comment), and (f) miscellaneous definitions of affiliative speech. There were 35 published studies that tested for gender differences in affiliative language.

Assertive Speech

Assertive speech refers to self-emphasizing verbal acts. The following forms of assertive speech were coded: (a) general measures of assertive speech, (b) giving information (descriptive statements, offering opinion, or explanations), (c) directives (imperative statements or direct suggestions), (d) disagreement, (e) negative speech (criticism or disapproval), (f) questions or requests for information, (g) suggestions, and (h) miscellaneous definitions of assertive speech. There were 59 published studies testing for gender differences in assertive language.

Table 1
Study Characteristics for Talkativeness Meta-Analysis

Study	*G*	*N*	1st author gender	Source	Gender study?	Age (mo.)	Partners	If parent	Gender comp.	Group size	Setting	Rec. meth.	Length (min.)	Meas. indep.	Activity	Op. def.	Statistic
Black & Logan (1995): a	0	43	W	1	G	42	P	N/A	U	3	S	V	45	1	U	1	$p = .50$
Black & Logan (1995): b	0	43	W	1	G	42	A	O	N/A	2	S	V	30	1	U	1	$p = .50$
Blakemore (1990)	0	20	W	2	G	67	O	O	N/A	3	H	O	240	1	U	4	$p = .50$
Brownell & Smith (1973)	0.57	56	W	2	G	48	P	N/A	N/A	3	S	N/A	N/A	1	S	3	$F = 4.51$
Cherry & Lewis (1976)	0.58	12	W	1	G	24	A	M	N/A	2	H	O	15	1	U	1	$p = .17$
Cook et al. (1985): a	−0.94	32	W	2	G	55	P	N/A	S	2	H	A	10	2	U	1	$F = 7.06$
Cook et al. (1985): b	0	32	W	2	G	55	P	N/A	S	2	H	A	10	2	U	3	$p = .50$
Coster et al. (1989)	0.72	40	W	1	N	30	A	M	N/A	2	H	V	45	1	U	3	$F = 5$
Cowan et al. (1967)	0	96	M	1	G	96	A	N/A	B	2	S	O	N/A	1	S	3	$p = .50$
Craig & Evans (1991)	0.58	20	W	2	G	103	A	N/A	B	2	H	V	30	1	O	3	$F = 1.66$
DeHart (1996)	−0.23	32	W	2	G	57	O	N/A	B	2	S	A	30	1	S	1	*M*
DeLoache & DeMendoza (1987)	0	30	W	2	N	15	A	M	N/A	2	L	V	N/A	1	S	5	$p = .50$
Dunham et al. (1991)	0	28	M	1	N	24	A	M	N/A	2	H	V	5	1	S	1	$p = .50$
Dunn et al. (1991): a	0	41	W	1	N	26	A	M	N/A	3	L	A	N/A	1	U	3	$p = .50$
Dunn et al. (1991): b	0	41	W	1	N	26	A	M	N/A	3	L	A	N/A	1	U	5	$p = .50$
Fagot et al. (1985): a	0	34	W	1	G	12	A	N/A	N/A	10	S	V	80	1	U	1	$p = .50$
Fagot et al. (1985): b	0.68	34	W	1	G	23	A	N/A	N/A	10	S	V	80	1	U	1	$F = 3.82$
Flannagan et al. (1995)	0	66	W	2	G	48	A	M	N/A	2	H	A	N/A	1	U	1	$p = .50$
Foot et al. (1997): 1a	0	20	M	1	G	90	P	N/A	S	2	L	V	6	2	S	2	$p = .50$
Foot et al. (1997): 1b	0	10	M	1	G	90	P	N/A	M	2	L	V	6	2	S	2	$p = .50$
Foot et al. (1997): 1c	0	20	M	1	G	90	P	N/A	S	2	L	V	6	2	S	2	$p = .50$
Foot et al. (1997): 1d	0	10	M	1	G	90	P	N/A	M	2	L	V	6	2	S	2	$p = .50$
Foot et al. (1997): 2a	0	40	M	1	G	90	P	N/A	S	2	L	V	6	2	S	2	$p = .50$
Foot et al. (1997): 2b	0	40	M	1	G	90	P	N/A	M	2	L	V	6	2	S	2	$p = .50$
Garvey & BenDebba (1974)	0	36	W	1	G	55	P	N/A	B	2	H	V	15	2	U	3	$p = .50$
Haas (1981): a	0.67	24	W	2	G	96	P	N/A	S	2	H	V	13	2	U	3	$t = 1.65$
Haas (1981): b	−0.46	24	W	2	G	96	P	N/A	M	2	H	V	13	2	U	3	$t = -1.59$
M. B. Harris & Hassemer (1972)	0	48	W	2	G	96	A	N/A	M	3	S	O	N/A	1	S	3	$p = .50$
Haslett & Bowen (1989)	0	12	W	2	G	60	P	N/A	B	4	L	V	120	2	U	5	$p = .50$
Hay et al. (1987): a	0.47	30	3	2	G	30	A	N/A	B	2	H	O	N/A	1	S	1	*M*
Hay et al. (1987): b	1.38	19	3	2	G	45	A	N/A	B	2	H	O	N/A	1	S	1	*M*
Heider (1971)	0	143	W	1	N	120	A	N/A	B	2	L	A	N/A	1	S	5	$p = .50$
D. L. Johnson (1974)	0	40	M	1	N	54	P	N/A	M	5	S	A	90	1	U	3	$p = .50$
Killen & Naigles (1995)	0	27	W	2	G	58	P	N/A	B	3	S	V	15	2	U	1	$p = .50$
Klecan-Aker (1984)	−0.01	48	W	2	G	150	A	N/A	B	2	H	A	5	1	S	3	$t = 0.39$
Koenigsknecht & Friedman (1976)	0.45	200	M	1	G	48	A	N/A	B	2	L	A	N/A	1	O	1	$F = 10.32$
Kolaric & Galambos (1995)	−0.39	60	W	2	G	180	P	N/A	M	2	L	V	30	2	S	2	G = N/A

(*table continues*)

Table 1 (*continued*)

Study	*G*	*N*	1st author gender	Source	Gender study?	Age (mo.)	Partners	If parent	Gender comp.	Group size	Setting	Rec. meth.	Length (min.)	Meas. indep.	Activity	Op. def.	Statistic
Langlois et al. (1973)	0.61	32	W	1	G	48	P	N/A	B	2	S	O	10	2	U	1	$p = .05$
Leaper & Gleason (1996)	0.86	24	M	2	G	43	A	O	N/A	2	L	V	20	1	S	1	$F = 4.39$
Leaper, Leve, et al. (1995)	0	77	M	2	G	46	A	M	N/A	2	H	V	16	1	S	1	$p = .50$
Liss (1983)	0	24	W	2	G	60	P	N/A	B	2	S	V	N/A	1	S	1	$p = .50$
Masur & Gleason (1980)	1.21	14	W	1	G	45	A	O	N/A	2	L	V	10	1	S	1	$F = 5.15$
Mather & Black (1984): a	0.27	158	W	1	N	54	A	N/A	B	2	O	A	N/A	1	S	1	$p = .05$
Mather & Black (1984): b	0	158	W	1	N	54	A	N/A	B	2	O	A	N/A	1	S	3	$p = .50$
McCloskey & Coleman (1992): a	0	52	W	2	G	107	P	N/A	S	2	S	A	15	1	S	3	$p = .50$
McCloskey & Coleman (1992): b	0	52	W	2	G	107	P	N/A	S	2	S	A	15	1	S	5	$p = .50$
McLoyd (1980)	0.78	18	W	1	G	51	P	N/A	S	2	S	V	20	2	U	1	$t = 2.35$
Milgram et al. (1971)	0	93	M	1	N	81	A	N/A	B	2	S	O	N/A	1	S	1	$p = .50$
L. C. Miller et al. (1985)	0	33	W	1	N	48	A	N/A	B	2	H	V	N/A	2	S	2	$p = .50$
Montemayor & Flannery (1989): a1	0.02	61	M	2	G	96	A	M	B	2	O	O	0.5	1	U	5	%
Montemayor & Flannery (1989): a2	0.14	37	M	2	G	150	A	M	B	2	O	O	0.5	1	U	5	%
Montemayor & Flannery (1989): a3	0.55	24	M	2	G	198	A	M	B	2	O	O	0.5	1	U	5	%
Montemayor & Flannery (1989): b1	0.22	28	M	2	G	96	P	M	B	2	O	O	0.5	1	U	5	%
Montemayor & Flannery (1989): b2	0.68	55	M	2	G	150	P	M	B	2	O	O	0.5	1	U	5	%
Montemayor & Flannery (1989): b3	−0.35	57	M	2	G	198	P	M	B	2	O	O	0.5	1	U	5	%
Moore & Porter (1988)	1.09	12	W	2	G	114	P	N/A	S	6	S	V	4	2	S	2	$p = .05$
Morse & Handley (1985)	0.21	155	W	2	G	144	P	N/A	M	20	S	A	18	1	U	2	$t = 1.33$
Morisset et al. (1995): a	0.74	54	W	1	G	20	A	M	N/A	2	L	V	7	1	S	3	$r = .35$
Morisset et al. (1995): b	1.21	54	W	1	G	20	A	M	N/A	2	L	V	7	1	S	4	$r = .50$
Mueller (1972)	−0.49	48	M	1	N	66	P	N/A	S	2	H	V	20	2	U	1	$p = .05$
Mullis & Mullis (1985)	0.26	32	M	2	G	114	A	O	N/A	2	H	V	15	1	S	3	*M*
Nohara (1996)	0	42	W	2	G	52	P	N/A	S	2	S	V	20	2	U	1	$p = .50$
Oscarson et al. (1987)	0	26	U	2	N	114	A	O	N/A	2	L	V	4	1	S	1	$p = .50$
Pellegrini & Perlmutter (1989)	−0.80	86	M	1	G	48	P	N/A	M	2	S	V	80	2	S	1	$F = 27.66$
Quay & Blaney (1992)	0	225	W	2	N	60	P	N/A	B	N/A	S	O	20	1	U	4	$p = .50$
Ramirez & Mendoza (1984)	−0.67	34	W	2	G	78	P	N/A	M	3	S	V	60	1	U	6	$F = 7.56$
Reese & Fivush (1993): a	1.10	24	W	1	G	40	A	O	N/A	2	L	A	N/A	1	S	2	$p = .01$

Table 1 (*continued*)

Study	*G*	*N*	1st author gender	Source	Gender study?	Age (mo.)	Partners	If parent	Gender comp.	Group size	Setting	Rec. meth.	Length (min.)	Meas. indep.	Activity	Op. def.	Statistic
Reese & Fivush (1993): b	0	24	W	1	G	40	A	O	N/A	2	L	A	N/A	1	S	3	$p = .50$
Schachter et al. (1978): a	0.42	66	W	1	G	24	P	N/A	M	N/A	S	O	N/A	1	U	3	$p = .05$
Schachter et al. (1978): b	0	64	W	1	G	29	P	N/A	M	N/A	S	O	N/A	1	U	3	$p = .50$
Serbin et al. (1979)	0	62	W	2	G	51	P	N/A	B	2	S	O	9	1	U	4	$p = .50$
Smith & Connolly (1972)	0.79	40	M	2	G	45	P	N/A	M	N/A	S	O	60	1	U	1	$p = .02$
Smith & Daglish (1977)	0	32	M	1	G	18	A	O	N/A	2	L	O	60	1	U	4	$p = .50$
Staley (1982)	0	80	W	2	G	120	A	N/A	B	2	O	A	N/A	1	S	1	$p = .50$
Stuckey et al. (1982)	0	40	W	1	G	49	A	O	N/A	3	L	O	45	1	U	4	$p = .50$
Turner (1991)	−0.58	40	W	1	G	48	P	N/A	B	N/A	S	A	90	1	U	4	*M*
Walker (1991)	0	80	M	2	G	150	A	O	N/A	3	L	A	45	1	S	2	$p = .50$
Webb (1984)	0.22	77	W	1	G	150	P	N/A	B	4	S	A	15	2	U	1	$t = 0.96$
Welkowitz et al. (1984)	0.46	52	W	2	G	96	P	N/A	B	2	S	A	20	1	U	2	*M*

Note. N/A = information not applicable; *G* = index of effect size; *N* = number of participants; 1st author gender (W = woman, M = man, U = unclear); Source = publication source (1 = top-tier journal, 2 = other source); Gender study? (G = gender study, N = nongender study); Age = participant age in months (mo.); Partners = relationship between participants (P = peer, A = adult); If parent = if interaction partner was a parent, which parent participated (M = mother only, O = other parent combination, either father or both mother and father); Gender comp. = gender composition of group (S = same-gender, M = mixed-gender, B = same-gender and mixed-gender combined, U = unclear); Group size = number of participants observed interacting together; Setting = observational setting (H = child's home, L = university lab, S = school, O = other setting); Rec. meth. = method of recording interaction (A = audiotape only, V = videotape, O = on-site coding only); Length = length of observation in minutes; Meas. indep. = measurement independence (1 = independent, 2 = interdependent); Activity = type of activity observed (U = unstructured activity, S = structured activity, O = other activity); Op. def. = operational definition (1 = total words, 2 = duration, 3 = mean length of utterance, 4 = time sampling/rate, 5 = other definition); Statistic = statistical value from which effect size was calculated.

Other Moderator Variables

In addition to investigating the magnitude of gender effects associated with the different language behaviors, we examined several moderator variables. Each of these factors is summarized below. Also, the effect sizes and the characteristics for each moderator variable associated with each study are presented for the three meta-analyses in Tables 1, 2, and 3, respectively.

Methodological Characteristics

In addition to operational definition, other methodological characteristics that were tested as moderators were measurement independence, method of recording (audiotape, videotape, or on-site scoring), length of observation, the first author's gender, the year the study was published, the gender focus of the study, and publication source. Measurement independence, gender focus, and publication source are explained in more detail below.

Measurement independence. This factor refers to whether the study's language measure was based on the analysis of only one targeted partner in an interaction or whether the language behavior of all participants was included. All of the studies that examined child–adult speech included separate speech measures of the individual child in each social interaction. Among studies of peer interactions, however, not all of the studies followed the same procedure. In approximately half of the cases, behavior was measured for only one target child in the social interaction (i.e., use of independent measures). In the other half of the studies, measures of speech behavior for all participating children in the social interaction were included in the analysis (i.e., use of interdependent measures). With regard to the latter set of studies, there were two ways that researchers treated their data. In some instances, each partner's behavior was treated as a within-group repeated measure (e.g., Kolaric & Galambos, 1995). In other cases, the group (e.g., the dyad) was treated as a unit, and scores for all partners were tallied together (e.g., Hartup, French, Laursen, Johnston, & Ogawa, 1993). Aggregating data across studies that used either independent or interdependent measurements is a challenge for a meta-analysis. Rather than discard half of the studies reported on a particular phenomenon, we chose to test this methodological variable as a moderator. We contrasted studies that used measures based on independent versus interdependent assessments of the participants.

Gender focus and publication source. The gender focus of the study and the publication source were tested as possible signs of publication bias (explained later). The gender focus moderator refers to whether or not the study's primary research question addressed gender as a topic. Although most collected studies were explicitly concerned with gender-related variations in social behavior, some studies included gender only as a secondary factor in the statistical analyses. With publication source, a distinction was made between studies published in any American Psychological Association (APA) or Society for Research in Child Development (SRCD) journal (e.g., *Developmental Psychology, Child Development*) versus other sources (i.e., other journals or book chapters). Although many excellent studies are often published in other sources, APA and SRCD are among the most selective outlets for publication, and they consistently publish work considered of excellent quality. Moreover, by using this method of classification, we did not need to make subjective evaluations of a given study's quality.

Table 2
Study Characteristics for Affiliative Meta-Analysis

Study	*G*	*N*	1st author gender	Source	Gender study?	Age (mo.)	Partners	If parent	Gender comp.	Group size	Setting	Rec. meth.	Length (min.)	Meas. indep.	Activity	Op. def.	Statistic
Ausch (1994)	0	80	W	2	G	68	P	N/A	B	2	L	V	N/A	2	S	3	$p = .5$
A. M. Austin et al. (1987): a	0.74	72	W	2	G	100	P	N/A	S	2	S	V	10	1	U	2	$F = 9.93$
A. M. Austin et al. (1987): b	0.65	72	W	2	G	100	P	N/A	S	2	S	V	10	1	U	4	$t = 1.95$
Becker & Smenner (1986): a	0.35	126	W	2	G	48	P	N/A	U	2	S	A	N/A	1	S	1	PR
Becker & Smenner (1986): b	0.36	124	W	2	G	48	A	N/A	N/A	2	S	A	N/A	1	S	1	PR
Black (1992)	0.79	68	W	1	G	54	P	N/A	S	3	S	V	10	1	U	5	$F = 10.72$
Black & Hazen (1990)	0.80	66	W	1	N	47	P	N/A	S	3	S	V	10	1	U	5	$F = 10.67$
Black & Logan (1995): a	0	43	W	1	G	42	P	N/A	N/A	3	S	V	45	1	U	4	$p = .5$
Black & Logan (1995): b	0	43	W	1	G	42	P	N/A	N/A	3	S	V	45	1	U	4	$p = .5$
Black & Logan (1995): c	0	43	W	1	G	42	A	O	B	2	S	V	30	1	U	4	$p = .5$
Black & Logan (1995): d	0	43	W	1	G	42	A	O	B	2	S	V	30	1	U	5	$p = .5$
Borja-Alvarez et al. (1991): a	−1.05	48	W	1	G	98	P	N/A	S	3	S	A	15	1	S	3	*M*
Borja-Alvarez et al. (1991): b	0	44	W	1	G	98	P	N/A	M	3	S	A	15	1	S	3	*M*
Burleson (1982)	0.34	144	M	2	G	141	A	N/A	N/A	2	S	A	N/A	1	S	2	$F = 4.27$
Denton & Zarbatany (1996): a	0	172	W	2	G	180	P	N/A	S	2	S	V	50	1	S	2	$p = .5$
Denton & Zarbatany (1996): b	0.34	172	W	2	G	180	P	N/A	S	2	S	V	50	1	S	5	$F = 4.85$
Feshbach & Sones (1971)	0.45	87	W	1	G	150	P	N/A	S	3	L	O	25	2	S	5	$\chi^2 = 4.2$
Filardo (1996): a	0.55	84	W	1	G	167	P	N/A	M	4	S	V	14	2	S	3	$F = 12.86$
Filardo (1996): b	0.24	84	W	1	G	167	P	N/A	M	4	S	V	14	2	S	6	$F = 2.39$
Grotevant & Cooper (1985): a	0	84	M	2	G	204	A	O	N/A	3	H	A	20	1	S	3	$p = .5$
Grotevant & Cooper (1985): b	0	84	M	2	G	204	A	O	N/A	3	H	A	20	1	S	4	$p = .5$
Grotevant & Cooper (1985): c	0	84	M	2	G	204	A	O	N/A	3	H	A	20	1	S	5	$p = .5$
Haslett (1983): a	0	10	W	1	G	36	P	N/A	B	3	S	A	15	1	U	5	$p = .5$
Haslett (1983): b	2.29	18	W	1	G	48	P	N/A	B	3	S	A	15	1	U	5	$\chi^2 = 10$
Haslett (1983): c	0	13	W	1	G	60	P	N/A	B	3	S	A	15	1	U	5	$p = .5$
Haslett & Bowen (1989)	0.29	12	W	1	N	60	P	N/A	B	4	L	V	120	2	U	5	%
Hauser et al. (1987)	0	79	M	2	G	174	A	O	N/A	3	O	A	N/A	1	S	2	$p = .5$
Klecan-Aker (1986)	0.48	240	W	2	G	42	A	N/A	N/A	2	O	A	30	1	S	5	$\chi^2 = 13.22$
Leaper (1991): a	−0.67	29	M	1	G	63	P	N/A	S	2	L	A	10	2	S	5	*M*
Leaper (1991): b	0	30	M	1	G	63	P	N/A	M	2	L	A	10	2	S	5	$p = .5$
Leaper (1991): c	4.25	16	M	1	G	84	P	N/A	S	2	L	A	10	2	S	5	*M*
Leaper (1991): d	0	18	M	1	G	84	P	N/A	M	2	L	A	10	2	S	5	$p = .5$
Leaper et al. (1999): a	0.08	70	M	1	G	86	P	N/A	S	2	S	V	N/A	2	S	3	$F = 0.12$
Leaper et al. (1999): b	0.12	70	M	1	G	86	P	N/A	S	2	S	V	N/A	2	S	5	$F = 0.23$
Leaper et al. (1999): c	0.14	36	M	1	G	86	P	N/A	M	2	S	V	N/A	2	S	3	$F = 0.34$
Leaper et al. (1999): d	0.15	36	M	1	G	86	P	N/A	M	2	S	V	N/A	2	S	5	$F = 0.43$
Leaper & Gleason (1996)	0	24	M	2	G	43	A	O	N/A	2	L	V	20	1	S	3	$p = .5$
Leaper, Leve, et al. (1995)	0	77	M	2	G	46	A	M	N/A	2	H	V	16	1	S	6	$p = .5$
Marche & Peterson (1993): a	0.14	120	W	2	G	168	P	N/A	S	2	L	A	20	2	S	4	*M*

Table 2 (*continued*)

Study	*G*	*N*	1st author gender	Source	Gender study?	Age (mo.)	Partners	If parent	Gender comp.	Group size	Setting	Rec. meth.	Length (min.)	Meas. indep.	Activity	Op. def.	Statistic
Marche & Peterson (1993): b	0.18	60	W	2	G	168	P	N/A	M	2	L	A	20	2	S	4	*M*
McCloskey & Coleman (1992): a	0	26	W	2	G	107	P	N/A	S	2	S	A	15	1	S	2	$p = .5$
McCloskey & Coleman (1992): b	−0.69	26	W	2	G	107	P	N/A	S	2	S	A	15	1	S	5	$p = .049$
McLoyd et al. (1984)	1.09	36	W	1	G	51	P	N/A	S	3	L	V	60	2	U	5	$\chi^2 = 8.2$
L. C. Miller et al. (1985): a	0	33	W	1	N	48	P	N/A	B	2	L	V	N/A	1	S	4	$p = .5$
L. C. Miller et al. (1985): b	0	33	W	1	N	48	P	N/A	B	2	L	V	N/A	1	S	5	$p = .5$
P. M. Miller et al. (1986): a	0.52	24	W	1	G	72	P	N/A	S	6	L	V	420	2	U	6	PR
P. M. Miller et al. (1986): b	0.31	24	W	1	G	72	P	N/A	M	6	L	V	420	2	U	6	PR
Pellegrini & Perlmutter (1989)	1.85	86	M	1	G	47	P	N/A	M	2	L	V	80	2	S	5	$F = 146.7$
Phillipsen (1999)	0.18	104	W	2	G	128	P	N/A	S	2	S	V	10	2	S	3	*M*
Rasku-Puttonen (1983)	0	40	W	2	G	90	A	O	N/A	2	S	V	19	1	S	1	$p = .5$
Schley & Snow (1992): a	−0.26	92	W	2	N	102	A	N/A	N/A	2	L	A	4	1	S	4	$r = .13$
Schley & Snow (1992): b	0.43	92	W	2	N	102	A	N/A	N/A	2	L	A	4	1	S	5	$r = .21$
Strough & Berg (2000)	0.75	35	W	1	G	145	P	N/A	S	2	S	V	15	2	U	1	*M*
Weiss & Sachs (1991)	0	44	W	2	N	60	A	N/A	N/A	2	L	A	N/A	1	S	6	$p = .5$
Zander & Van Egmond (1958)	0	422	M	1	G	102	P	N/A	M	3	S	O	N/A	1	U	2	$p = .5$
Zeldin et al. (1982): a	1.07	19	M	1	G	187	P	N/A	M	10	O	O	360	1	S	2	$F = 5.35$
Zeldin et al. (1982): b	0	19	M	1	G	187	P	N/A	M	10	O	O	360	1	S	5	$p = .5$

Note. N/A = information not applicable; *G* = index of effect size; *N* = number of participants; 1st author gender (W = woman, M = man, U = unclear); Source = publication source (1 = top-tier journal, 2 = other source); Gender study? (G = gender study, N = nongender study); Age = participant age in months (mo.); Partners = relationship between participants (P = peer, A = adult); If parent = if interaction partner was a parent, which parent participated (M = mother only, O = other parent combination, either father or both mother and father); Gender comp. = gender composition of group (S = same-gender, M = mixed-gender, B = same-gender and mixed-gender combined, U = unclear); Group size = number of participants observed interacting together; Setting = observational setting (H = child's home, L = university lab, S = school, O = other setting); Rec. meth. = method of recording interaction (A = audiotape only, V = videotape, O = on-site coding only); Length = length of observation in minutes; Meas. indep. = measurement independence (1 = independent, 2 = interdependent); Activity = type of activity observed (U = unstructured activity, S = structured activity, O = other activity); Op. def. = operational definition (1 = general definition of affiliation, 2 = praise, 3 = agreement, 4 = acknowledgment, 5 = responsiveness, 6 = other definition); Statistic = statistical value from which effect size was calculated; PR = proportion score.

Child Age

The mean age of the children used in each sample was examined. When studies reported pertinent results for different age levels, they were treated as separate samples. Child age was tested as a categorical moderator with six age levels corresponding to important periods in children's development: 12–35 months (language development), 36–71 months (preschool), 72–119 months (childhood), 120–155 months (preadolescence), and over 156 months (adolescence). Most studies were conducted with children of preschool or middle childhood ages (see the Results section). Of studies with adolescents, most were with younger adolescents; the oldest sample included was a study conducted with 17-year-olds (204 months).

Relationship Between Participants

Initially, different types of interaction partners were identified for comparison (unfamiliar peers, friends, classmates, parents, etc.). Because there were not a sufficient number of studies reflecting all of these categories, a simpler distinction was made between interactions with peers versus interactions with adults. However, studies looking at parent–child interactions were subject to further testing. Initially, a distinction was made between the following interaction partners: (a) mother, (b) father, (c) alternating mother and father, (d) mother and father together, and (e) other arrangements involving parents. Because of the low occurrences of studies that looked only at fathers or at both mothers and fathers (either together

Table 3
Study Characteristics for Assertive Meta-Analysis

Study	*G*	*N*	1st author gender	Source	Gender study?	Age (mo.)	Partners	If parent	Gender comp.	Group size	Setting	Rec. meth.	Length (min.)	Meas. indep.	Activity	Op. def.	Statistic
Abramovitch et al. (1979)	0	68	W	1	G	37	P	N/A	M	2	H	O	120	2	U	5	$p = .5$
Abramovitch et al. (1980)	0	72	W	1	G	43	P	N/A	B	2	H	O	120	2	U	5	$p = .5$
Archer et al. (1988)	−0.469	144	M	2	G	102	P	N/A	M	6	S	O	40	1	U	5	$F = 15.9$
Ausch (1994): a	0	80	W	2	G	68	P	N/A	B	2	L	V	N/A	2	S	3	$p = .5$
Ausch (1994): b	0	80	W	2	G	68	P	N/A	B	2	L	V	N/A	2	S	4	$p = .5$
Ausch (1994): c	0	80	W	2	G	68	P	N/A	B	2	L	V	N/A	2	S	6	$p = .5$
A. M. Austin et al. (1987)	0.696	72	W	2	G	100	P	N/A	S	2	S	V	20	1	U	1	$F = 8.73$
Black (1992): a	0	68	W	1	G	52	P	N/A	S	3	L	V	10	1	U	2	$p = .5$
Black (1992): b	0	68	W	1	G	52	P	N/A	S	3	L	V	10	1	U	3	$p = .5$
Black (1992): c	0.482	68	W	1	G	52	P	N/A	S	3	L	V	10	1	U	5	$F = 3.95$
Black (1992): d	−0.491	68	W	1	G	52	P	N/A	S	3	L	V	10	1	U	6	$F = 4.11$
Black (1992): e	−0.798	68	W	1	G	52	P	N/A	S	3	L	V	10	1	U	7	$F = 10.85$
Black & Logan (1995): a	0	43	W	1	G	42	P	N/A	U	3	S	V	45	1	U	8	$p = .5$
Black & Logan (1995): b	0	43	W	1	G	42	A	O	N/A	2	S	V	30	1	U	8	$p = .5$
Borja-Alvarez et al. (1991): a1	0.2	48	W	1	G	98	P	N/A	S	3	S	V	15	1	S	3	*M*
Borja-Alvarez et al. (1991): b1	−0.19	48	W	1	G	98	P	N/A	S	3	S	V	15	1	S	4	*M*
Borja-Alvarez et al. (1991): c1	0.526	48	W	1	G	98	P	N/A	S	3	S	V	15	1	S	6	*M*
Borja-Alvarez et al. (1991): d1	0.22	48	W	1	G	98	P	N/A	S	3	S	V	15	1	S	7	*M*
Borja-Alvarez et al. (1991): a2	0	44	W	1	G	98	P	N/A	M	3	S	V	15	1	S	3	*M*
Borja-Alvarez et al. (1991): b2	−0.316	44	W	1	G	98	P	N/A	M	3	S	V	15	1	S	4	*M*
Borja-Alvarez et al. (1991): c2	0.564	44	W	1	G	98	P	N/A	M	3	S	V	15	1	S	6	*M*
Borja-Alvarez et al. (1991): d2	0	44	W	1	G	98	P	N/A	M	3	S	V	15	1	S	7	*M*
Camras (1984)	0	144	W	2	G	66	P	N/A	M	2	O	V	12	2	S	3	$p = .5$
Cook et al. (1985): a	0.722	32	W	2	G	54	P	N/A	S	2	L	A	10	2	U	2	$F = 4.18$
Cook et al. (1985): b	0.768	32	W	2	G	54	P	N/A	S	2	L	A	10	2	U	3	$F = 4.73$
Craig & Evans (1991)	1.454	20	W	2	G	96	A	N/A	N/A	2	L	V	30	2	O	1	$t = 2.3$
DeHart (1996)	−0.261	32	W	2	G	57	U	N/A	B	2	S	A	30	1	S	3	%
Eisenberg (1996)	0.599	80	W	2	G	54	A	M	N/A	2	H	A	25	1	S	3	$\chi^2 = 6.6$
Endsley et al. (1979)	−0.531	40	M	1	N	66	A	M	N/A	2	L	O	20	1	U	6	$t = 1.68$
Esposito (1979)	0	10	W	2	G	50	P	N/A	S	2	S	A	10	2	U	8	*M*
Feshbach & Sones (1971)	−0.255	87	W	1	G	150	P	N/A	M	3	L	O	25	2	S	5	$\chi^2 = 1.4$
Filardo (1996): a	0.185	84	W	1	G	167	P	N/A	N/A	4	S	V	14	2	S	3	$F = 0.72$
Filardo (1996): b	0.805	84	W	1	G	167	P	N/A	N/A	4	S	V	14	2	S	7	$F = 13.63$
Filardo (1996): c	0.759	84	W	1	G	167	P	N/A	N/A	4	S	V	14	2	S	8	$F = 6.34$
Grotevant & Cooper (1985): a	0.543	84	M	1	N	204	A	O	N/A	3	H	A	20	1	S	2	$t = 2.48$
Grotevant & Cooper (1985): b	0	84	M	1	N	204	A	O	N/A	3	H	A	20	1	S	4	$p = .5$
Grotevant & Cooper (1985): c	0.569	84	M	1	N	204	A	O	N/A	3	H	A	20	1	S	6	$t = 2.6$

Table 3 (*continued*)

Study	*G*	*N*	1st author gender	Source	Gender study?	Age (mo.)	Partners	If parent	Gender comp.	Group size	Setting	Rec. meth.	Length (min.)	Meas. indep.	Activity	Op. def.	Statistic
Grotevant & Cooper (1985): d	0	84	M	1	N	204	A	O	N/A	3	H	A	20	1	S	7	$p = .5$
Haas (1981): a	0.571	24	W	2	G	96	P	N/A	S	2	L	A	13	2	U	2	$t = 0.99$
Haas (1981): b	0.588	24	W	2	G	96	P	N/A	S	2	L	A	13	2	U	3	$t = 1.02$
Haas (1981): c	0.502	24	W	2	G	96	P	N/A	S	2	L	A	13	2	U	4	$t = 0.87$
Haas (1981): d	−0.288	24	W	2	G	96	P	N/A	S	2	L	A	13	2	U	6	$t = 0.5$
Haas (1981): e	−0.161	24	W	2	G	96	P	N/A	S	2	L	A	13	2	U	7	$t = 0.28$
Haas (1981): f	0.499	24	W	2	G	96	P	N/A	M	2	L	A	13	2	U	2	$t = 1.73$
Haas (1981): g	−0.453	24	W	2	G	96	P	N/A	M	2	H	A	13	2	U	3	$t = 1.57$
Haas (1981): h	−0.202	24	W	2	G	96	P	N/A	M	2	L	A	13	2	U	4	$t = 0.7$
Haas (1981): i	0.282	24	W	2	G	96	P	N/A	M	2	L	A	13	2	U	6	$t = 0.98$
Haas (1981): j	0.568	24	W	2	G	96	P	N/A	M	2	L	A	13	2	U	7	$t = 1.97$
Hartup et al. (1993): a	−0.647	132	M	1	N	114	P	N/A	S	2	L	V	12	2	S	2	$F = 13.81$
Hartup et al. (1993): b	0.632	132	M	1	N	114	P	N/A	S	2	L	V	12	2	S	3	$F = 13.2$
Haslett (1983): a1	0	10	W	2	G	36	P	N/A	B	N/A	S	A	15	1	U	2	$p = .5$
Haslett (1983): b1	0.047	10	W	2	G	36	P	N/A	B	N/A	S	A	15	1	U	3	%
Haslett (1983): c1	0	10	W	2	G	36	P	N/A	B	N/A	S	A	15	1	U	5	$p = .5$
Haslett (1983): a2	−1.45	18	W	2	G	48	P	N/A	B	N/A	S	A	15	1	U	2	$\chi^2 = 6$
Haslett (1983): b2	0	18	W	2	G	48	P	N/A	B	N/A	S	A	15	1	U	3	$p = .5$
Haslett (1983): c2	0	18	W	2	G	48	P	N/A	B	N/A	S	A	15	1	U	5	$p = .5$
Haslett (1983): a3	0	13	W	2	G	60	P	N/A	B	N/A	S	A	15	1	U	2	$p = .5$
Haslett (1983): b3	1.903	13	W	2	G	60	P	N/A	B	N/A	S	A	15	1	U	3	$\chi^2 = 6$
Haslett (1983): c3	−1.625	13	W	2	G	60	P	N/A	B	N/A	S	A	15	1	U	5	$\chi^2 = 5$
Haslett & Bowen (1989): a	0.182	12	W	2	G	60	P	N/A	B	4	L	V	120	2	U	1	%
Haslett & Bowen (1989): b	0.316	12	W	2	G	60	P	N/A	B	4	L	V	120	2	U	2	%
Haslett & Bowen (1989): c	−0.059	12	W	2	G	60	P	N/A	B	4	L	V	120	2	U	3	%
Haslett & Bowen (1989): d	0.381	12	W	2	G	60	P	N/A	B	4	L	V	120	2	U	6	%
Hauser et al. (1987)	0	79	M	2	G	174	A	O	N/A	3	O	A	0	1	S	1	$p = .5$
Hazen & Black (1989): a	−0.623	48	W	1	N	53	P	N/A	S	3	L	V	10	2	U	2	*M*
Hazen & Black (1989): b	0	48	W	1	N	53	P	N/A	S	3	L	V	10	2	U	3	$p = .5$
Hazen & Black (1989): c	0	48	W	1	N	53	P	N/A	S	3	L	V	10	2	U	6	$p = .5$
Hendrick & Stange (1991)	1.074	18	W	2	G	48	A	N/A	N/A	5	S	O	N/A	1	S	8	$t = 2.28$
Jacklin & Maccoby (1978): a	0.277	48	W	1	G	33	P	N/A	S	2	L	O	26	2	U	3	*M*
Jacklin & Maccoby (1978): b	0.024	42	W	1	G	33	P	N/A	M	2	L	O	26	2	U	3	*M*
Kerig et al. (1993)	−0.306	38	W	1	G	44	A	O	N/A	2	L	V	10	1	S	1	*M*
Killen & Naigles (1995): a	0.95	27	W	2	G	58	P	N/A	B	3	S	V	15	2	U	3	$\chi^2 = 4.97$
Killen & Naigles (1995): b	−0.879	27	W	2	G	58	P	N/A	B	3	S	V	15	2	U	4	$\chi^2 = 4.37$
Kolaric et al. (1995): a	0.235	60	W	2	G	180	P	N/A	M	2	L	V	30	2	S	6	$p = .5$
Kolaric et al. (1995): b	0.005	60	W	2	G	180	P	N/A	M	2	L	V	30	2	S	8	$p = .5$
Kuczynski et al. (1987): a	0	70	M	1	N	30	A	M	N/A	2	O	V	90	1	O	2	$p = .5$
Kuczynski et al. (1987): b	0	70	M	1	N	30	A	M	N/A	2	O	V	90	1	O	5	$p = .5$

(*table continues*)

Table 3 (*continued*)

Study	*G*	*N*	1st author gender	Source	Gender study?	Age (mo.)	Partners	If parent	Gender comp.	Group size	Setting	Rec. meth.	Length (min.)	Meas. indep.	Activity	Op. def.	Statistic
Leaper (1991): a1	0.667	29	M	1	G	62	P	N/A	B	2	L	A	10	2	S	3	*M*
Leaper (1991): b1	0	30	M	1	G	62	P	N/A	B	2	L	A	10	2	S	3	$p = .5$
Leaper (1991): a2	3.676	16	M	1	G	88	P	N/A	B	2	L	A	10	2	S	3	*M*
Leaper (1991): b2	0	18	M	1	G	88	P	N/A	B	2	L	A	10	2	S	3	$p = .5$
Leaper et al. (1989)	0	32	M	2	G	172	A	O	N/A	3	S	A	N/A	1	S	5	$p = .5$
Leaper & Gleason (1996): a	0	24	M	2	G	43	A	O	N/A	2	L	V	20	1	S	2	$p = .5$
Leaper & Gleason (1996): b	0	24	M	2	G	43	A	O	N/A	2	L	V	20	1	S	6	$p = .5$
Leaper & Gleason (1996): c	0	24	M	2	G	43	A	O	N/A	2	L	V	20	1	S	7	$p = .5$
Leaper, Leve, et al. (1995)	0	77	M	2	G	46	A	M	N/A	2	H	V	16	1	S	7	$p = .5$
Leaper et al. (1999): a	0.387	70	M	1	G	86	P	N/A	S	2	S	V	N/A	2	S	3	$F = 2.52$
Leaper et al. (1999): b	0.088	36	M	1	G	86	P	N/A	M	2	S	V	N/A	2	S	3	$F = 0.14$
Lindow et al. (1985)	0.847	40	W	1	G	90	P	N/A	M	4	S	V	60	2	U	4	$z = 2.47$
Lloyd & Goodwin (1993): a	−0.083	10	W	2	G	55	P	N/A	S	10	S	V	N/A	1	U	3	PR
Lloyd & Goodwin (1993): b	0.069	10	W	2	G	55	P	N/A	M	10	S	V	N/A	1	U	3	PR
McCabe & Lipscomb (1988): a	−0.055	32	W	2	G	55	P	N/A	M	16	S	A	1080	1	U	5	*M*
McCabe & Lipscomb (1988): b	0.352	64	W	2	G	121	P	N/A	M	16	S	A	2630	1	U	5	$F = 3.97$
McCloskey & Coleman (1992): a	0	52	W	2	G	107	P	N/A	S	2	S	A	15	1	S	3	$p = .5$
McCloskey & Coleman (1992): b	0.686	52	W	2	G	107	P	N/A	S	2	S	A	15	1	S	5	$p = .049$
McCloskey & Coleman (1992): c	0	52	W	2	G	107	P	N/A	S	2	S	A	15	1	S	6	$p = .5$
McCloskey & Coleman (1992): d	−0.686	52	W	2	G	107	P	N/A	S	2	S	A	15	1	S	8	$p = .049$
P. M. Miller et al. (1986): a	0.085	24	W	1	G	72	P	N/A	M	6	L	V	420	2	U	2	PR
P. M. Miller et al. (1986): b	0.102	24	W	1	G	72	P	N/A	M	6	L	V	420	2	U	2	PR
Moore & Porter (1988)	0	202	W	2	G	126	P	N/A	S	6	S	V	4	2	S	8	$p = .5$
Mullis & Mullis (1985)	0.273	86	M	2	G	115	A	O	N/A	2	H	V	20	1	S	7	$F = 1.6$
Mullis et al. (1990): a	2.564	18	M	2	G	108	A	O	N/A	3	H	V	22	1	S	2	*M*
Mullis et al. (1990): b	1.148	18	M	2	G	108	A	O	N/A	3	H	V	22	1	S	7	*M*
Nohara (1996): a	0.542	42	W	2	G	52	P	N/A	S	2	S	V	23	2	U	3	$p = .09$
Nohara (1996): b	0	42	W	2	G	52	P	N/A	S	2	S	V	23	2	U	4	$p = .5$
Pellegrini & Perlmutter (1989): a	1.303	86	U	1	G	47	P	N/A	M	2	L	V	80	2	S	3	$F = 73.02$
Pellegrini & Perlmutter (1989): b	1.21	86	U	1	G	47	P	N/A	M	2	L	V	80	2	S	7	$F = 63.04$

Table 3 (*continued*)

Study	*G*	*N*	1st author gender	Source	Gender study?	Age (mo.)	Partners	If parent	Gender comp.	Group size	Setting	Rec. meth.	Length (min.)	Meas. indep.	Activity	Op. def.	Statistic
Phillipsen (1999): a	0.543	104	W	2	G	128	P	N/A	S	2	S	V	10	2	S	4	$F = 7.65$
Phillipsen (1999): b	0.438	104	W	2	G	128	P	N/A	S	2	S	V	10	2	S	6	$F = 5.01$
Phillipsen (1999): c	0.608	104	W	2	G	128	P	N/A	S	2	S	V	10	2	S	7	$F = 9.64$
Powlishta & Maccoby (1990): a	−0.08	96	W	2	G	52	P	N/A	M	2	L	V	10	2	S	3	*M*
Powlishta & Maccoby (1990): b	−0.16	96	W	2	G	52	P	N/A	M	2	L	V	10	2	S	7	*M*
Rasku-Puttonen (1983): a	−0.772	40	W	2	G	90	A	O	N/A	2	L	V	19	1	S	3	*M*
Rasku-Puttonen (1983): b	0	40	W	2	G	90	A	O	N/A	2	L	V	19	1	S	5	$p = .5$
Serbin et al. (1982): a	0.636	74	W	2	G	53	P	N/A	B	N/A	S	O	36	1	U	1	$F = 7.48$
Serbin et al. (1982): b	0.298	74	W	2	G	53	P	N/A	B	N/A	S	O	36	1	U	3	$t = 1.65$
Turner (1991)	0.939	40	W	1	G	48	P	N/A	B	N/A	S	A	90	1	U	3	$p = .006$
Walker (1991)	0	80	M	2	G	150	A	O	N/A	3	S	A	68	1	S	8	$p = .5$
Webb (1984): a	0.13	68	W	1	G	150	P	N/A	M	4	S	A	15	2	S	2	$t = 0.49$
Webb (1984): b	−0.078	68	W	1	G	150	P	N/A	M	4	S	A	15	2	S	6	$t = 0.46$
Webb & Kenderski (1985): a11	0.391	68	W	2	G	156	P	N/A	S	4	S	V	15	2	S	2	*M*
Webb & Kenderski (1985): a12	0.063	57	W	2	G	168	P	N/A	S	4	S	V	15	2	S	2	*M*
Webb & Kenderski (1985): a21	0.387	68	W	2	G	156	P	N/A	S	4	S	V	15	2	S	6	*M*
Webb & Kenderski (1985): a22	0.053	57	W	2	G	168	P	N/A	S	4	S	V	15	2	S	6	*M*
Webb & Kenderski (1985): b11	−0.439	68	W	2	G	156	P	N/A	M	4	S	V	15	2	U	2	*M*
Webb & Kenderski (1985): b12	−0.379	57	W	2	G	168	P	N/A	M	4	S	V	15	2	U	2	*M*
Webb & Kenderski (1985): b21	−0.294	68	W	2	G	156	P	N/A	M	4	S	V	15	2	U	6	*M*
Webb & Kenderski (1985): b22	0.208	57	W	2	G	168	P	N/A	M	4	S	V	15	2	U	6	*M*
Weiss & Sachs (1991): a	0.639	44	W	2	N	61	A	N/A	N/A	2	L	A	N/A	1	S	2	$F = 4.46$
Weiss & Sachs (1991): b	0	44	W	2	N	61	A	N/A	N/A	2	L	A	N/A	1	S	3	$p = .5$
Weiss & Sachs (1991): c	−0.689	44	W	2	N	61	A	N/A	N/A	2	L	A	N/A	1	S	7	$F = 5.19$
Welkowitz et al. (1984)	−0.435	52	W	2	G	96	P	N/A	B	2	S	A	20	1	U	8	*M*
Wilkinson et al. (1985): a	0	24	W	2	G	90	P	N/A	M	4	S	A	15	2	U	3	*M*
Wilkinson et al. (1985): b	0	24	W	2	G	90	P	N/A	M	4	S	A	15	2	U	4	$p = .5$
Wilkinson et al. (1985): c	0	24	W	2	G	90	P	N/A	M	4	S	A	15	2	U	5	$p = .5$

(*table continues*)

Table 3 (*continued*)

Study	*G*	*N*	1st author gender	Source	Gender study?	Age (mo.)	Partners	If parent	Gender comp.	Group size	Setting	Rec. meth.	Length (min.)	Meas. indep.	Activity	Op. def.	Statistic
Zander & Van Egmond (1958): a	0.162	418	M	1	G	100	P	N/A	M	N/A	S	O	N/A	1	U	3	$p = .049$
Zander & Van Egmond (1958): b	0	418	M	1	G	100	P	N/A	M	N/A	S	O	N/A	1	U	5	$p = .5$
Zander & Van Egmond (1958): c	0	418	M	1	G	100	P	N/A	M	N/A	S	O	0	1	U	7	$p = .5$

Note. N/A = information not applicable; *G* = index of effect size; *N* = number of participants; 1st author gender (W = woman, M = man, U = unclear); Source = publication source (1 = top-tier journal, 2 = other source); Gender study? (G = gender study, N = nongender study); Age = participant age in months (mo.); Partners = relationship between participants (P = peer, A = adult); If parent = if interaction partner was a parent, which parent participated (M = mother only, O = other parent combination, either father or both mother and father); Gender comp. = gender composition of group (S = same-gender, M = mixed-gender, B = same-gender and mixed-gender combined, U = unclear); Group size = number of participants observed interacting together; Setting = observational setting (H = child's home, L = university lab, S = school, O = other setting); Rec. meth. = method of recording interaction (A = audiotape only, V = videotape, O = on-site coding only); Length = length of observation in minutes; Meas. indep. = measurement independence (1 = independent, 2 = interdependent); Activity = type of activity observed (U = unstructured activity, S = structured activity, O = other activity); Op. def. = operational definition (1 = general definition of assertiveness, 2 = informing statement, 3 = directive, 4 = disagreement, 5 = negative statement, 6 = request for information, 7 = suggestion, 8 = other definition); Statistic = statistical value from which effect size was calculated; PR = proportion score.

or separately), a simpler contrast was made between studies that looked only at mothers versus other studies.

Other Features of the Interactive Context

Five additional aspects of the interactive context that were tested as potential moderating variables are described below. They included familiarity (whether the child was familiar or unfamiliar with the other interaction partners), group size (dyads vs. groups), gender composition (same gender vs. mixed gender), observational setting (university research laboratory, children's school, or children's home), and activity (described below). With regard to gender composition, in some studies both same- and mixed-gender interactions were observed but the researchers did not distinguish between them in their analyses; these studies were excluded when testing this moderator.

Activities were initially classified into one of several categories. Because of the low number of studies representing specific activity types, a simpler distinction was subsequently made between structured and unstructured activities. Structured activities included assigned toys, problem-solving tasks, assigned discussion topics, structured school activities, and other miscellaneous structured activities, whereas unstructured activities included free play, naturalistic home activities, and other miscellaneous unstructured activities. Studies that did not clearly indicate the activity were not included when testing this moderator. Intercoder reliability was assessed between two researchers to classify the type of activity for each study. For the type of activity (using the more full set of categories), the kappa was .94, which is considered an excellent level of agreement (see Fleiss, 1981).

Statistical Analyses

Effect Sizes

B. Johnson's (1989, 1993) DSTAT software was used to carry out the statistical analyses. Cohen's *d* was used as the measure of effect size, which represents the difference in standard deviation units. When analyzing the central tendency of results for each language variable across studies, DSTAT reports Cohen's *d* as measures of effect size for group differences with lower and upper ranges for a 95% confidence interval (CI). Cohen (1988) characterized effect sizes as small when $d = 0.2$, medium when $d = 0.5$, and large when $d = 0.8$. Thus, an effect size below 0.2 is considered negligible.

B. Johnson's (1989, 1993) DSTAT program computes effect sizes associated with observed statistical values (i.e., *F* test, *t* test, χ^2, correlation coefficient, or *p* values). It can also compute effect sizes when means, standard deviations, and group sizes are indicated. However, there were some studies that did not provide sufficient information to determine exact effect sizes. In some cases when a statistically significant gender effect was noted without any accompanying statistical information, we assigned a *p* value of .05 to determine the study's effect size. For studies indicating a statistically nonsignificant gender effect without exact statistical information (i.e., a statistical value, a *p* value, or means and standard deviations), a *p* value of .50 and an effect size of 0 were assigned. These strategies for dealing with incomplete information provide conservative estimates (Rosenthal, 1991).

Inferential Statistics

DSTAT computes the combined effect sizes across studies as well as focused comparison tests of effect sizes on blocked and continuous moderator variables. The moderating influences of blocked variables were examined using the analog to the analysis of variance technique (explained below). The influences of continuous moderators were analyzed using a focused comparison of effect sizes that tests for a linear relationship between the predictor and the magnitude of effect sizes as measured by a Fisher's *Z* value (B. Johnson, 1993; Mullen, 1989).

DSTAT models the between-study variance of blocked variables using the analog to the analysis of variance technique (B. Johnson, 1989). Similar to the one-way analysis of variance, this technique handles categorical independent variables, which are used to group effect sizes into mutually exclusive categories (Lipsey & Wilson, 2001). This procedure partitions the total variance into the portion explained by the categorical variable (Q_B), and the residual pooled within-groups portion (Q_W). Each of these *Q*s is distributed as a chi-square statistic. Interpretation of the fit of the categorical models is twofold: (a) a significant Q_B statistic indicates that

the mean effect sizes across groups differ by more than sampling error, and (b) a nonsignificant Q_W indicates homogeneity of effect sizes within the groups, indicating no further variation among effect sizes. If a model indicates a significant Q_W for a level of a categorical variable, that variable alone is not sufficient for understanding its constituent effect sizes (Lipsey & Wilson, 2001). Thus, the influence of other independent variables may be investigated within the heterogeneous level of the original variable. This method of understanding the interrelationship of categorical moderators to the effect sizes was used rather than modeling multiple independent variables in a single analysis. In this way, analyses were not conducted on sets of studies in which there was no further variance of effect sizes to explain.

Trimming

To ensure that the overall effect sizes for each of the analyses accurately represented the overall distribution of effects, we used a trimming procedure to examine the stability of the overall effect size. Two separate analyses were performed to exclude the most extreme 10% and 20% of sampled studies to test overall effects with these reduced samples. These procedures did not dramatically alter the findings, indicating that overall effect sizes were not dependent on a small proportion of the samples included in the meta-analyses (see the Results section).

Units of Analysis

For the unit of analysis (*k*), we separately used tests, independent samples, publications, and labs. Each of these units is explained below. Also, the average gender effects for each of these four units of analysis are presented by language construct in Table 7.

Test. Test as a unit of analysis refers to counting each individual statistical test as an independent contribution. It was the unit of analysis used when examining operational definition as a moderator. When test is used as the unit of analysis, studies that include more than one operational definition of the construct attain more weight in the average computation of the effect than do those that include only one operational definition. Therefore, test is not an appropriate unit of analysis when analyzing other moderators.

Independent samples. The use of independent samples as the unit of analysis refers to the number of independent groups for whom gender comparisons were made. For example, several studies reported gender effects separately for same-gender and mixed-gender conversations. These were treated as two independent samples and entered separately into the meta-analyses. The independent sample was the unit of analysis used to test each of the moderator variables except for operational definition (explained above).

Publication. The publication unit of analysis refers to the overall finding from any given published study. Therefore, if a given publication included either more than one test for a given sample or more than one sample, the effect sizes were averaged.

Lab. When lab was the unit of analysis, articles written by the same author were averaged. It is advisable to compare analyses run using independent samples with those run using publication and lab to check for possible bias that is due to the inclusion of multiple samples from a few publications or investigators.

The "File Drawer Problem"

Some authors advocate including unpublished studies in meta-analyses out of concern for the "file drawer problem"—meaning that there may be a bias toward the publication of significant results, with many null results going unpublished and thereby residing in researcher's files. Tracking down unpublished studies, however, can be time-consuming and expensive (in cases of ordering microfiches). In recent years, some researchers have called into question the necessity of including unpublished studies in all meta-analyses. Recent reviews indicate that it is common to find meta-analyses based only on published studies (Sharpe, 1997) and that meta-analyses with published and unpublished studies usually do not differ in their results (Sutton, Duval, Tweedie, Abrams, & Jones, 2000).

There are four reasons why the file drawer problem does not appear relevant in the present set of meta-analyses. First, including unpublished studies is primarily warranted when reviewing a research area with few published studies (Sharpe, 1997)—which was not the case here (see the Results section). Second, the present set of sampled studies indicated no shortage of null results. This finding is depicted in the stem-and-leaf plots of the effect sizes for each of the meta-analyses, which are presented in Tables 4, 5, and 6. It is also reflected by the negligible average effect sizes for all three language measures (see the Results section). Third, another manifestation of publication bias might be seen if gender effects were more likely in studies published in top-tier journals than in those from other sources. Yet there was no significant difference with either talkativeness, $Q_B(1) = 0.12$, *ns*; affiliative speech, $Q_B(1) = 0.04$, *ns*; or assertive speech, $Q_B(1) = 0.73$, *ns*. In summary, our decision to include only published studies does not appear to have inflated our average effect sizes. Finally, if there was a publication bias toward reporting significant gender effects, then one might expect the bias to be more likely in studies focusing on gender than in those that did not. This was not found with either talkativeness, $Q_B(1) = 1.72$, *ns*, or affiliative speech, $Q_B(1) = 0.12$, *ns*. However, among studies of assertive speech, effect sizes were larger in gender studies ($k = 67$, $d = 0.13$, 95% CI = 0.06–0.19, $r = .06$) than in nongender studies ($k = 6$, $d = -0.10$, 95% CI = −0.29–0.10, $r = -.05$), $Q_B(1) = 4.67$, $p < .05$. Otherwise, the tests consistently point to the absence of any evidence for the file drawer problem—with the prevalence of null results perhaps being the most compelling point.

Results

Gender effects on amount of talking, affiliative language, and assertive language were analyzed separately. As described in the

Table 4
Stem and Leaf Display of Mean Effect Sizes for Gender Differences in Talkativeness

Stem	Leaf
−0.8	0
−0.7	
−0.6	0 7
−0.5	8
−0.4	6 9
−0.3	5
−0.2	3 8
−0.1	
−0.0	1
0.0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 2
0.1	4 8
0.2	1 2 2 6
0.3	
0.4	2 5 6 7
0.5	5 7 7 8
0.6	1 7 8 8
0.7	0 1 2 8 9
0.8	6
0.9	
1.0	9
1.1	5
1.2	0 1
1.3	8

Table 5
Stem and Leaf Display of Mean Effect Sizes for Gender Differences in Affiliative Talk

Stem	Leaf
−1.0	5
−0.9	
−0.8	
−0.7	
−0.6	7
−0.5	3
−0.4	
−0.3	
−0.2	
−0.1	
−0.0	
0.0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0.1	2 4 4 7 8 8
0.2	3 9
0.3	1 4 5 6
0.4	5 8
0.5	1 2
0.6	8
0.7	5 9
0.8	0 5
0.9	
1.0	9
2.2	9
2.6	1
4.2	5

Method section, two types of moderators were tested—methodological qualities and aspects of the interactive context. Focused comparison tests of significance levels and effect sizes were carried out for each moderator with each language variable.

The results are summarized in Tables 7–17. In Table 7, average gender effects on talkativeness, affiliative speech, and assertive speech by type of analysis (test, sample, publication, or lab) are presented. Table 8 summarizes the tests of the categorical moderators using the Q_B statistic. In addition, Table 9 presents the results of testing for the correlations between the continuous moderators and sample effect sizes. In Tables 10 (all samples) and 11 (separate analyses for child–adult and peer-only interactions), the average gender effects for each of the three language constructs blocked by operational definition are summarized. The effects of the other moderator variables are presented separately for each language construct in Tables 12–17 (described below). Excluding operational definition, all of the analyses looking for potential moderators of gender differences were carried out, first, using all available independent samples and, second, separately examining samples with peers or adults as interaction partners.

Talkativeness

Overall Gender Effects

A total of 73 independent samples with a total sample of 3,303 examined gender differences in children's talkativeness. Among these investigations, the mean effect size (*d*) was 0.11 (95% CI = 0.04–0.18). The overall effect size remained similar when the analysis was run by test, by publication, and by researcher lab (see Table 7). The positive direction of the effect size indicates that, as predicted, girls were significantly more talkative than boys. As described below, the magnitude of the effect size also varied depending on other moderator variables.

When 10% of the sampled scores were trimmed, there were 66 remaining studies with a statistically significant gender difference with an effect size of $d = 0.08$ (95% CI = 0.01–0.15) or $r = .04$. When 20% of sampled scores were trimmed, there were 58 remaining studies with a statistically significant gender difference and an effect size of $d = 0.08$ (95% CI = 0.01–0.15) or $r = .04$. Thus, trimming 10% or 20% of the scores did not appreciably affect the overall finding, which means that there was no apparent bias from outlier scores.

Moderators

The findings for the tested categorical moderators using all of the independent samples are summarized in Tables 8 and 12. The results regarding the continuous moderators are presented in Table 9. Of these factors, interaction partner was a significant moderator. The magnitude of gender differences in talkativeness was greater in child–adult interactions ($d = 0.19$) than in peer interactions ($d = 0.03$).

An inspection of the mean effect sizes broken down by age level in Table 12 indicates a sizable and statistically significant ($d = 0.32$) effect size at the youngest age level. When the older age

Table 6
Stem and Leaf Display of Mean Effect Sizes for Gender Differences in Assertive Talk

Stem	Leaf
−1.6	6
−1.5	
−1.4	
−1.3	
−1.2	
−1.1	2
−1.0	
−0.9	
−0.8	
−0.7	
−0.6	5 6
−0.5	3
−0.4	0 4 4
−0.3	1
−0.2	6 6
−0.1	8
−0.0	1 3 6 6 8
0.0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 2 3 4 5 7 9 9
0.1	0 2 2 6 6
0.2	1 4 7 8
0.3	0 0 3 6 9
0.4	5
0.5	0 3 7
0.6	0 0 7
0.7	0
0.8	5 5
0.9	1 4
1.0	7
1.1	
1.2	
1.3	
1.4	4 5
2.0	3
3.6	8

Table 7
Gender Effects on Talkativeness, Affiliative Speech, and Assertive Speech by Type of Analysis for All Independent Samples

Type of analysis	*k*	*N*	*d*	95% CI	*r*	Q_w
Talkativeness						
Test	79	3,664	0.11**	0.05–0.17	.06	123.30**
Sample	73	3,303	0.11**	0.04–0.18	.06	107.05**
Publication	61	3,476	0.11**	0.05–0.18	.06	93.53**
Lab	57	3,717	0.13**	0.07–0.20	.07	98.69**
Affiliative speech						
Test	59	3,595	0.22**	0.16–0.28	.11	164.82**
Sample	46	2,694	0.26**	0.19–0.33	.12	172.91**
Publication	35	3,151	0.25**	0.18–0.32	.12	135.73**
Lab	28	3,058	0.26**	0.18–0.33	.13	117.70**
Assertive speech						
Test	146	7,171	0.10**	0.06–0.15	.05	379.28**
Sample	75	3,495	0.11**	0.05–0.17	.04	229.88**
Publication	59	4,097	0.09**	0.03–0.15	.04	198.01**
Lab	49	3,999	0.08**	0.02–0.14	.04	186.09**

Note. Positive effect sizes reflect higher scores for girls than boys on talkativeness, for girls than boys on affiliative speech, and for boys than girls on assertive speech. CI = confidence interval.
** $p < .01$.

levels (36 months and above) were combined ($k = 61$, $d = 0.08$, 95% CI = 0.01–0.15, $r = .06$) and compared with the youngest age level, the test was statistically significant, $Q_B(1) = 5.67$, $p < .05$.

Examining Child–Adult and Peer Interactions Separately

Significant heterogeneity of effect sizes remained for studies of peer interactions, $Q_W(39) = 60.74$, $p < .05$; therefore, the other moderators were tested using peer samples separately. In contrast, effect sizes for studies of child–adult interactions were not significantly heterogeneous, $Q_W(34) = 40.74$, *ns*; therefore, child–adult interactions were not further tested for moderators.

During peer interactions, age and method of recording significantly moderated gender differences in talkativeness, and three other factors had a marginal impact on effect sizes (see Tables 8 and 13). Gender effects on talkativeness were greater among children 120–155 months old ($d = 0.30$) than among children 36–71 months old ($d = -0.05$) and children 156 months and older ($d = -0.30$). Interactions that were videotaped ($d = -0.15$) yielded effect sizes that were significantly lower than those for studies that coded interactions on-site ($d = 0.15$). Although neither of these effect sizes was statistically significant, it is notable that the direction of the effect differs for the two methods of measurement.

Marginal moderators included group size, $Q_B(1) = 2.83$, $p = .09$; activity type, $Q_B(1) = 2.83$, $p = .09$; and measurement

Table 8
Tests of Categorical Moderator Influences on Gender Differences in Talkativeness, Affiliative Speech, and Assertive Speech for All Samples and by Partner, Using the Q_B Statistic

	Talkativeness			Affiliative speech			Assertive speech		
Moderator	All samples	Child–adult	Peers	All samples	Child–adult	Peers	All samples	Child–adult	Peers
Operational definition	1.45		4.18	20.97*		17.24*	20.79**	6.50	34.87*
Measurement independence			3.50†			4.76*			2.59
First author gender	0.28		1.66	1.97		0.49	1.62	0.82	1.19
Type of recording	1.09		7.26**	10.82**		19.42**	5.19†	0.41	5.36†
Child age level	8.17†		10.17*	16.64**		18.04**	0.14	2.33	0.52
Partner	5.56*			0.57			0.07		
Familiarity	0.00		0.25	1.73		0.38	3.21†	1.12	2.16
Group size	0.01		2.83†	1.19		0.95	5.82*	0.25	9.16**
Gender composition	0.07		0.09	0.31		0.31	3.43†		3.43†
Setting	2.36		3.23	4.14		3.82†	1.15	6.17*	0.53
Activity	0.23		2.83†	12.08**		15.20**	0.00	2.30	0.64

Note. All moderators had 1 degree of freedom except as follows: Operational definition ($df = 4$ for talkativeness, $df = 5$ for affiliative speech, $df = 7$ for assertive speech), type of recording ($df = 2$), child age level ($df = 5$ for talkativeness with child–adult; $df = 4$ for talkativeness with child–adult; $df = 3$ for affiliative and assertive speech), and setting ($df = 2$). There were not sufficient studies to test gender composition in child–adult samples.
† $p < .10$. * $p < .05$. ** $p < .01$.

Table 9
Focused Comparison of Significance Levels Using Fischer's Z to Examine Continuous Moderators and Effect Sizes for Gender Differences in Talkativeness, Affiliative Speech, and Assertive Speech for All Samples and by Partner

	Talkativeness			Affiliative speech			Assertive speech		
Moderator	All samples	Child–adult	Peers	All samples	Child–adult	Peers	All samples	Child–adult	Peers
Length of observation	−1.26		−1.01	0.73		0.59	0.79	0.40	0.77
	(55)		(34)	(34)		(27)	(66)	(15)	(51)
Publication year	−0.03		−1.64	−1.08		−0.89	2.46*	2.47*	1.69†
	(73)		(39)	(44)		(33)	(73)	(17)	(56)

Note. The number of samples (*k*) for each moderator appears in parentheses below the Fischer's *Z* value. Information on length of observation was not provided in all studies.
† $p = .05$. * $p < .05$.

independence, $Q_B(1) = 3.50$, $p = .06$. Gender differences were marginally greater in group interactions of three or more children ($d = 0.14$) than in dyads ($d = -0.04$). Unstructured activities ($d = 0.09$) yielded effect sizes that were marginally greater than those for structured activities ($d = -0.09$). Measurement independence was also a marginally significant moderator, with independent analyses ($d = 0.10$) producing greater effect sizes than interdependent analyses ($d = -0.09$). In all of these marginal results, the magnitudes of the effect sizes in all of the comparison conditions were negligible. Therefore, it is unclear if any of these findings have any practical importance.

Summary

The results revealed an average gender difference, with girls being more talkative than boys. Although the average gender difference was statistically significant, it was relatively negligible in magnitude. Larger effects were seen in child–adult interactions. During peer interactions, moderator tests indicated that larger gender differences occurred with preadolescent children 120–155 months of age. Peer interactions that were videotaped yielded smaller gender differences than interactions that were coded on-site.

Table 10
Gender Effects on Talkativeness, Affiliative Speech, and Assertive Speech by Operational Definition for All Independent Samples

Language construct and operational definition	*k*	*N*	*d*	95% CI	*r*
Talkativeness					
Total words	28	1,456	0.13**	0.02–0.23	.06
MLU	19	831	0.15*	0.02–0.28	.08
Rate	7	473	0.07*	−0.11–0.25	.03
Duration	13	433	0.12	−0.05–0.29	.06
Other	12	551	0.04	−0.13–0.20	.02
Affiliative speech					
General	4	325	$0.35_{a,b}$**	0.13–0.57	.17
Responsive	24	1,251	0.41_{a}**	0.30–0.52	.20
Praise	7	811	$0.13_{b,c}$	−0.01–0.26	.06
Acknowledge	8	517	$0.09_{b,c}$	−0.08–0.26	.04
Agree	9	492	0.05_{c}	−0.11–0.22	.03
Other	5	199	$0.15_{a,b,c}$	−0.10–0.40	.08
Assertive speech					
General	6	295	0.37_{a}*	0.14–0.60	.18
Directive	38	1,806	0.23_{a}*	0.15–0.32	.12
Suggest	13	1,092	$0.13_{a,b}$*	0.02–0.24	.07
Disagree	11	477	$0.10_{a,b}$	−0.07–0.27	.05
Request information	19	1,004	$0.12_{a,b}$	−0.01–0.24	.06
Negative	16	918	-0.01_{b}	−0.12–0.10	−.01
Inform	22	935	0.01_{b}	−0.12–0.14	.00
Other	10	644	0.03_{b}	−0.12–0.19	.02

Note. With talkativeness and affiliative speech, a positive effect size indicates a higher mean score for girls than boys. With assertive speech, a positive effect size indicates a higher mean score for boys than girls. The moderating effect of operational definition on gender differences in each of the language constructs was analyzed using test as the unit of analysis. Subscripts indicate that operational definition was a significant moderator (see text); effect sizes with different subscripts are significantly different ($p < .05$). CI = confidence interval; MLU = mean length of utterance.
* $p < .05$. ** $p < .01$.

Table 11
Gender Effects on Talkativeness, Affiliative Speech, and Assertive Speech by Operational Definition and Partner (Adults vs. Peers)

Language construct and operational definition	Child–adult interactions					Peer interactions				
	k	*N*	*d*	95% CI	*r*	*k*	*N*	*d*	95% CI	*r*
Talkativeness										
Total words	16	938	0.24*	0.11–0.37	.12	11	454	−0.08	−0.27–0.10	−.04
MLU	10	537	0.15	−0.02–0.31	.07	9	210	0.16	−0.04–0.36	.08
Rate	3	126	0.47*	0.10–0.83	.23	3	327	−0.07	−0.28–0.15	−.03
Duration	3	137	0.17	−0.17–0.51	.08	10	296	0.10	−0.09–0.30	.05
Other	6	336	0.05	−0.16–0.27	.03	6	163	0.01	−0.25–0.27	.01
Affiliative speech										
General	2	164	0.27	−0.04–0.58	.13	2	161	$0.43_{a,b}$*	0.12–0.74	.21
Responsive	4	314	0.33*	0.15–0.52	.17	20	422	0.45_{a}*	0.31–0.59	.22
Praise	2	223	0.22	−0.04–0.48	.11	5	286	$0.10_{b,c}$	−0.06–0.25	.05
Acknowledge	3	240	−0.11	−0.38–0.16	−.05	5	150	$0.22_{a,b}$	0.00–0.44	.11
Agree	2	42	0.00	−0.38–0.38	.00	7	254	0.06_{c}	−0.12–0.25	.03
Other	2	104	0.00	−0.36–0.36	.00	3	36	$0.29_{a,b}$	−0.05–0.63	.14
Assertive speech										
General	3	137	0.08	−0.26–0.43	.04	3	72	0.62_{a}*	0.30–0.94	.30
Directive	3	240	0.11	−0.20–0.42	.05	34	1,098	0.25_{b}*	0.16–0.34	.12
Suggest	6	348	0.04	−0.18–0.25	.02	10	547	0.16_{b}*	0.04–0.29	.08
Disagree	1	32	0.00	−0.43–0.43	.00	10	602	$0.11_{b,c,d}$	−0.07–0.30	.06
Request information	3	122	0.18	−0.15–0.50	.09	16	692	$0.11_{b,c,d}$	−0.03–0.24	.05
Negative	3	118	0.00	−0.33–0.33	.00	13	467	$-0.02_{c,d}$	−0.13–0.10	−.01
Inform	5	302	0.42*	0.16–0.68	.20	17	583	-0.12_{d}	−0.26–0.06	.09
Other	3	141	0.12	−0.22–0.45	.06	7	307	$0.01_{c,d}$	−0.17–0.19	.00

Note. With talkativeness and affiliative speech, a positive effect size indicates a higher mean score for girls than boys. With assertive speech, a positive effect size indicates a higher mean score for boys than girls. The moderating effect of operational definition on gender differences in each of the language constructs was analyzed using test as the unit of analysis. Subscripts indicate that operational definition was a significant moderator (see text); effect sizes with different subscripts are significantly different ($p < .05$). CI = confidence interval; MLU = mean length of utterance.
* $p < .05$.

Affiliative Language

Overall Gender Effects

Among the 46 independent samples (total $N = 2{,}694$) comparing girls' and boys' use of affiliative language, the mean effect size (*d*) was 0.26 (95% CI = 0.19–0.33). The effect size did not differ appreciably when the analysis was run by test, by publication, or by researcher lab (see Table 7). The positive effect size indicated that girls used significantly more affiliative language than did boys, as hypothesized. The subsequent analyses examined the moderating influences of other variables.

With 10% trimming, there were 40 remaining studies with a statistically significant gender difference with an effect size of $d = 0.23$ (95% CI = 0.15–0.30) or $r = .11$. When 20% of sampled scores were trimmed, there were 35 remaining studies with a statistically significant gender difference and an effect size of $d = 0.14$ (95% CI = 0.06–0.22) or $r = .07$. The results from the trimming analyses suggest that there was no apparent bias from outlier scores.

Moderators

Four significant categorical moderators of gender differences in affiliative speech were revealed in the analyses. First, the type of measure used to index affiliative language was a significant moderator of gender effects, $Q_B(5) = 20.97$, $p < .01$. Comparison tests indicated that effect sizes were significantly larger with responsiveness ($d = 0.41$) than with praise ($d = 0.13$), acknowledgments ($d = 0.09$), or agreements ($d = 0.05$) (see Table 10). General definitions ($d = 0.35$) of affiliative speech were also greater than agreements.

In addition to operational definition, other significant categorical moderators included child age level, type of recording, and type of activity (see Tables 8 and 14). Social interactions that were videotaped ($d = 0.40$) yielded significantly greater effect sizes than did interactions that were either audiotaped ($d = 0.19$) or coded on-site ($d = 0.10$). Gender differences in affiliative language were significantly larger among children 24–71 months old ($d = 0.41$) than among children 72–119 months old ($d = 0.08$) and children 156 months and older ($d = 0.19$). Also, gender differences were greater among children 120–155 months old ($d = 0.36$) than among children 72–119 months old. Finally, gender differences were significantly larger during unstructured activities ($d = 0.58$) than during structured activities ($d = 0.21$).

Examining Child–Adult and Peer Interactions Separately

When gender effects on affiliative speech were analyzed separately by partner type, significant heterogeneity of effect sizes occurred for studies of peer interaction, $Q_W(32) = 154.89$, $p < .01$, but not for studies of child–adult interaction, $Q_W(10) = 10.05$ *ns.* Therefore, the other moderators were tested only with studies that used peer samples. However, readers should note that partner type (adult vs. peer) was not a significant moderator of gender differences in affiliative speech (see Table 8).

Table 12
Comparison Tests of Moderator Variables of Gender Effects on Talkativeness for All Independent Samples

Moderator	*k*	*d*	95% CI	*r*
First author gender				
Woman	45	0.12*	0.03–0.20	.06
Man	25	0.08	−0.03–0.19	.04
Type of recording				
Video	34	0.05	−0.07–0.17	.03
Audio	17	0.12*	0.01–0.23	.06
Observation	21	0.14*	0.02–0.25	.07
Child age level				
12–35 months	12	0.32*	0.14–0.51	.16
36–71 months	30	0.09	−0.01–0.19	.04
72–119 months	20	0.06	−0.05–0.21	.03
120–155 months	8	0.13	−0.02–0.28	.06
Over 156 months	3	−0.17	−0.51–0.18	−.08
Partner				
Peer	39	0.03_{a}	−0.06–0.12	.02
Adult	34	0.19_{b}*	0.10–0.28	.09
Familiarity				
Stranger	19	0.12*	0.01–0.23	.06
Familiar	52	0.11*	0.03–0.20	.06
Group size				
Dyad	53	0.11*	0.03–0.19	.06
Group	20	0.11	−0.01–0.22	.05
Gender composition				
Same gender	11	0.00	−0.22–0.21	.00
Mixed gender	12	−0.03	−0.16–0.10	−.02
Setting				
Lab	20	0.19*	0.06–0.32	.09
School	28	0.06	−0.03–0.16	.09
Home	17	0.08	−0.08–0.25	.04
Activity				
Unstructured	36	0.10*	0.01–0.20	.05
Structured	35	0.07	−0.02–0.17	.04

Note. A negative effect size indicates that boys were more talkative than girls. For each moderator, subscripts are shown when the variable was significant. Mean effect sizes (*d*) with different subscripts are significantly different ($p < .05$). CI = confidence interval.
* $p < .05$.

Interactions With Peers

Operational definition was a significant moderator of affiliative speech when examined with peers only, $Q_B(5) = 17.24$, $p < .01$ (see Tables 8 and 11). Effect sizes were significantly larger with responsiveness ($d = 0.45$) or general definitions ($d = 0.43$) than with agreements ($d = 0.06$). Effect sizes measured by responsiveness were also greater than effect sizes measured by praise ($d = 0.10$). Acknowledgments ($d = 0.22$), and miscellaneous definitions ($d = 0.29$) of affiliative speech were not significantly different from other operational definitions.

Child age level, observational setting, type of activity, type of recording, and measurement independence were significant moderators of gender differences in affiliative speech during peer interactions (see Tables 8 and 15). First, gender differences in affiliative speech were greater among preschool children 24–71 months of age ($d = 0.51$) and children 120–155 months of age ($d = 0.36$) than among children 72–119 months of age ($d = 0.05$). Gender differences among preschool children were also larger than gender differences among adolescents 156 months and older ($d = 0.26$). Second, gender differences in affiliative speech were marginally more likely to occur in a laboratory setting ($d = 0.41$) than in a school setting ($d = 0.22$), $Q_B(1) = 3.82$, $p = .05$. Third, gender differences were considerably greater during unstructured activities ($d = 0.65$) than during structured activities ($d = 0.20$). Fourth, greater gender differences were found in videotaped interactions ($d = 0.48$) than in either audiotaped ($d = 0.08$) or on-site observations ($d = 0.10$). Finally, gender differences were significantly greater when interdependent measures ($d = 0.39$) were used than when independent measures were used ($d = 0.19$).

Follow-Up Analyses

Peer interactions among preschool-age children. A highly significant heterogeneity of effect sizes occurred among studies of preschool-age (24- to 71-month-old) children observed with peers, $Q_W(16) = 86.28$, $p < .01$. Given the remaining variability as well as the high number of studies ($k = 16$) at this age level, further analysis of the five key contextual moderators (gender composition, activity type, group size, setting, and familiarity) was possi-

Table 13
Comparison Tests of Moderator Variables of Gender Effects on Talkativeness During Peer Interactions

Moderator	*k*	*d*	95% CI	*r*
Measurement independence[a]				
Independent	19	0.10	−0.02–0.22	.05
Interdependent	20	−0.09	−0.24–0.07	−.04
First author gender				
Woman	26	0.07	−0.04–0.18	.03
Man	13	−0.07	−0.25–0.11	−.04
Type of recording				
Video	20	-0.15_{a}	−0.31–0.01	−.08
Audio	8	$0.05_{a,b}$	−0.14–0.23	.02
Observation	10	0.15_{b}	−0.01–0.31	.08
Child age level				
12–35 months	2	$0.20_{a,b}$	−0.15–0.55	.10
36–71 months	19	-0.05_{b}	−0.18–0.08	−.02
72–119 months	13	$0.07_{a,b}$	−0.14–0.27	.04
120–155 months	3	0.30_{a}*	0.06–0.54	.15
Over 156 months	2	-0.30_{b}	−0.67–0.08	−.15
Familiarity				
Stranger	7	−0.05	−0.27–0.18	−.02
Familiar	30	0.05	−0.05–0.16	.03
Group size				
Dyad	24	−0.05	−0.18–0.08	−.02
Group	15	0.11	−0.02–0.24	.06
Gender composition				
Same gender	11	−0.01	−0.22–0.21	−.01
Mixed gender	11	−0.05	−0.21–0.12	.07
Setting				
Lab	8	−0.07	−0.34–0.20	−.04
School	22	0.07	−0.05–0.18	.03
Home	6	−0.20	−0.49–0.10	−.10
Activity				
Unstructured	24	0.09	−0.03–0.20	.04
Structured	15	−0.09	−0.25–0.08	−.04

Note. A negative effect size indicates that boys were more talkative than girls. For each moderator, subscripts are shown when the variable was significant. Mean effect sizes (*d*) with different subscripts are significantly different ($p < .05$). CI = confidence interval.
[a] The comparison test for measurement independence was almost significant ($p = .06$).
* $p < .05$.

Table 14
Comparison Tests of Moderator Variables of Gender Effects on Affiliative Speech for All Independent Samples

Moderator	*k*	*d*	95% CI	*r*
Author gender				
Woman	30	0.30*	0.21–0.39	.15
Man	14	0.19*	0.07–0.31	.09
Type of recording				
Video	21	0.40_a*	0.29–0.52	.20
Audio	20	0.19_b*	0.09–0.30	.10
On-site	3	0.10_b	−0.08–0.27	.05
Child age level				
24–71 months	22	0.41_a*	0.29–0.53	.18
72–119 months	12	0.08_b*	0.06–0.21	.04
120–155 months	4	$0.36_{a,c}$*	0.15–0.56	.17
Over 156 months	7	$0.19_{b,c}$*	0.03–0.35	.09
Partner				
Peer	33	0.28*	0.19–0.37	.14
Adult	11	0.22*	0.09–0.35	.11
Familiarity				
Stranger	9	0.34*	0.20–0.48	.17
Familiar	35	0.23*	0.16–0.31	.11
Size				
Dyad	26	0.30*	0.20–0.39	.15
Group	18	0.20*	0.08–0.32	.10
Gender composition				
Same gender	15	0.32*	0.19–0.45	.16
Mixed gender	10	0.26*	0.12–0.40	.13
Setting				
Lab	17	0.34*	0.19–0.48	.17
School	22	0.23*	0.13–0.32	.11
Home	2	0.00	−0.31–0.31	.00
Activity				
Unstructured	12	0.58_a*	0.39–0.78	.28
Structured	32	0.21_b*	0.13–0.29	.10

Note. A negative effect size indicates that boys used more affiliative speech than girls. For each moderator, subscripts are shown when the variable was significant. Mean effect sizes (*d*) with different subscripts are significantly different ($p < .05$). CI = confidence interval.
* $p < .05$.

ble. Compared with the previously described findings for peer interactions (see Tables 8 and 15), gender composition emerged as a significant moderator of gender differences in affiliative speech among preschool-age children, $Q_B(1) = 7.41$, $p < .01$. Gender differences were larger in mixed-gender peer interaction ($d = 1.27$, 95% CI = 0.88–1.66, $k = 3$) than in same-gender peer interaction ($d = 0.61$, 95% CI = 0.33–0.88, $k = 5$).

It was not possible to separate the influences of group size and activity type with this reduced sample of studies because the two factors were confounded. All group interactions involved unstructured activities, and all dyadic interactions involved structured activities. These factors did not significantly moderate gender differences in children's affiliative language, $Q_B(1) = 1.27$, *ns.*

Whereas observational setting was a significant moderator when all ages were tested, there was no significant gender difference in affiliative speech among preschool-age children observed in the laboratory versus in the school, $Q_B(1) = 0.00$, *ns.* Also, the moderating effect of familiarity of partner could not be tested when the analysis was limited to the preschool-age group, as all studies were conducted with a familiar partner.

Associations between measurement independence and other moderators. As described earlier, measurement independence was a significant moderator of effect sizes with affiliative speech. Given the magnitude of the difference in effect sizes between the two conditions, we carried out follow-up tests to see if any of the other significant moderators were associated with measurement independence. A chi-square test revealed that there was a disproportionate percentage of studies using interdependent measures that were conducted with preschool children, $\chi^2(3, N = 33) = 11.26$, $p < .05$. More specifically, all 8 of the studies conducted with preschool-age children used interdependent measures. Within the older age levels, there was more of a balance of studies that used independent measures and studies that used interdependent measures. The other moderator that was significantly associated with measurement independence was the observational setting, $\chi^2(1, N = 33) = 14.40$, $p < .01$. Studies conducted in the lab (13 out of 14) tended to use interdependent measures, whereas studies conducted in schools (14 out of 19) tended to use independent measures. Thus, the observed influence of the child age and the observational setting moderators may have been somewhat affected by the researchers' data-analytic strategy.

Table 15
Comparison Tests of Moderator Variables of Gender Effects on Affiliative Speech During Peer Interactions

Moderator	*k*	*d*	95% CI	*r*
Measurement independence				
Independent	15	0.19_a*	0.07–0.31	.10
Interdependent	18	0.39_b*	0.26–0.52	.19
Author gender				
Woman	24	0.30*	0.19–0.41	.15
Man	9	0.23*	0.08–0.39	.12
Type of recording				
Video	17	0.48_a*	0.36–0.61	.23
Audio	13	0.08_b	−0.09–0.25	.04
On-site	3	0.10_b	−0.08–0.27	.05
Child age level				
24–71 months	16	0.51_a*	0.36–0.67	.25
72–119 months	9	0.05_b	−0.10–0.20	.03
120–155 months	3	0.36_c*	0.10–0.63	.18
Over 156 months	5	$0.26_{b,c}$*	0.07–0.45	.13
Familiarity				
Stranger	5	0.35*	0.12–0.58	.17
Familiar	28	0.27*	0.17–0.36	.13
Group size				
Dyad	17	0.32*	0.20–0.44	.16
Group	16	0.23*	0.11–0.36	.12
Gender composition				
Same gender	15	0.32*	0.19–0.45	.16
Mixed gender	10	0.26*	0.12–0.40	.13
Setting				
Lab	14	0.41_a*	0.25–0.57	.20
School	18	0.22_b*	0.11–0.32	.11
Home	0			
Activity				
Unstructured	11	0.65_a*	0.45–0.86	.31
Structured	22	0.20_b	0.10–0.29	.10

Note. A negative effect size indicates that boys used more affiliative speech than girls. For each moderator, subscripts are shown when the variable was significant. Mean effect sizes (*d*) with different subscripts are significantly different ($p < .05$). CI = confidence interval.
* $p < .05$.

Summary

Girls were significantly more likely than boys to use affiliative speech, although the magnitude of the difference was negligible. More substantial effect sizes ($d > 0.3$) were found with specific measures of affiliative speech. Also, larger effect sizes tended to be found when social interactions were analyzed using videotape versus audiotape or on-site coding. When age level was taken into account, the largest effect sizes were seen during early childhood and preadolescence. With regard to contextual moderators, we found that gender differences in affiliative speech were greater during unstructured activities than during structured activities. When peer interactions were analyzed separately, there were similar findings regarding the moderating influences of operational definition, recording method, child age, and type of activity. Additional tests looking at peer interactions in early childhood indicated larger gender differences in affiliative speech during mixed-gender than same-gender interactions.

Assertive Language

Overall Gender Effects

Gender effects on assertive language were examined by 75 independent samples with a total sample of 3,495 participants. The mean effect size (d) was 0.11 (95% CI = 0.05–0.17). As hypothesized, boys used significantly more assertive language than did girls. The effect size did not appreciably differ when the analysis was run by test, by publication, and by researcher lab (see Table 7).

There were 66 remaining studies when 10% of the sampled scores were trimmed. The test indicated a statistically significant gender difference with an effect size of $d = 0.10$ (95% CI = 0.04–0.16) or $r = .05$. There were 59 remaining studies when 20% of sampled scores were trimmed. There was a nonsignificant gender difference and an effect size of $d = 0.03$ (95% CI = −0.04–0.09) or $r = .01$. Thus, trimming 10% of the scores did not appreciably affect the overall finding. Trimming 20% of the scores reduced the effect size somewhat, but it was already rather negligible.

Moderators

The operational definition was a significant moderator of gender effects on assertive language, $Q_B(7) = 20.79$, $p < .01$. As can be seen in Table 10, the effect size was significantly larger when general measures ($d = 0.37$) and directive language ($d = 0.23$) were tested than when negative statements ($d = -0.01$), giving information ($d = 0.01$), and miscellaneous measures ($d = 0.03$) were used. Requests for information ($d = 0.12$), disagreements ($d = 0.10$), and suggestions ($d = 0.13$) did not significantly differ from any other operational definitions.

Among the other moderators that we investigated, group size and year of publication were significant influences (see Table 9). Familiarity of partner and gender composition were also marginally significant moderators (see Tables 8 and 16). Effect sizes were positively related to year of publication ($Z = 2.46$), which suggests that reports of gender differences in assertive language have increased over the years. Effect sizes were significantly larger when children were part of a dyad ($d = 0.17$) than when they were in larger groups ($d = 0.01$). Furthermore, gender effects were marginally larger during interactions with strangers ($d = 0.32$) than during interactions with familiar partners ($d = 0.10$). The moderating influences of familiarity and group size were somewhat confounded, however, because a disproportionate number of interactions between strangers occurred in dyads rather than in groups, $\chi^2(1, N = 67) = 4.53$, $p < .05$. Thus, because the children who participated in dyadic interactions were more likely to interact with strangers, we cannot ascertain whether the greater gender differences in assertive speech emerged as a function of the familiarity of the partner or the number of people in the group. Finally, the gender composition of the interaction was a marginally significant moderator of gender differences, with larger differences occurring in same-gender interactions ($d = 0.18$) than in mixed-gender interactions ($d = 0.04$).

Table 16
Comparison Tests of Moderator Variables of Gender Effects on Assertive Speech for All Independent Samples

Moderator	k	d	95% CI	r
First author gender				
Woman	53	0.11*	0.04–0.19	.06
Man	19	0.03	−0.07–0.13	.02
Type of recording				
Video	38	0.14*	0.06–0.23	.07
Audio	25	0.15*	0.03–0.28	.08
On-site	10	−0.02	−0.14–0.11	−.01
Child age level				
24–71 months	36	0.12*	0.02–0.21	.06
72–119 months	22	0.10	−0.01–0.21	.05
120–155 months	6	0.11	−0.05–0.27	.05
Over 156 months	9	0.08	−0.08–0.24	.04
Partner				
Peer	56	0.11*	0.04–0.18	.06
Adult	17	0.09	−0.04–0.22	.04
Familiarity				
Stranger	8	0.32*	0.08–0.56	.16
Familiar	62	0.10*	0.03–0.16	.05
Group size				
Dyad	37	0.17_a*	0.08–0.26	.08
Group	30	0.01_b	−0.09–0.10	.00
Gender composition				
Same gender	17	0.18*	0.06–0.30	.09
Mixed gender	22	0.04	−0.06–0.13	.02
Setting				
Lab	26	0.08	−0.04–0.20	.04
School	37	0.11*	0.03–0.20	.06
Home	7	0.20*	0.02–0.38	.10
Activity				
Unstructured	27	0.10	−0.03–0.23	.05
Structured	42	0.10*	0.03–0.17	.05

Note. A negative effect size indicates that girls used more assertive language than boys. For each moderator, subscripts are shown when the variable was significant. Mean effect sizes (d) with different subscripts are significantly different ($p < .05$). CI = confidence interval.
* $p < .05$.

Examining Child–Adult and Peer Interactions Separately

Homogeneity tests indicated that there was significant heterogeneity of effect sizes for studies of child–adult interaction, $Q_W(16) = 36.87$, $p < .01$, as well as for studies of peer interaction, $Q_W(55) = 144.81$, $p < .01$. Therefore, the other moderators of

gender differences in assertive speech were additionally tested using peer and child–adult samples separately. However, there was no significant difference in average effect sizes between child–adult interactions and peer interactions (see Table 8).

Child-adult interactions. When we tested only child–adult interactions, observational setting and year of publication were significant moderators of gender differences in assertive speech. As can be seen in Table 17, significantly larger effect sizes were associated with interactions observed in the home ($d = 0.28$) than with those observed in research laboratories ($d = -0.17$). Year of publication was positively related to effect sizes ($Z = 2.47$), suggesting that greater gender differences in assertive speech were associated with later studies (see Table 9).

Peer interactions. Analyses with peer interactions yielded a significant effect of operational definition (see Tables 8 and 11). Similar to the pattern previously indicated when all samples were tested, significantly larger effect sizes were associated with general measures ($d = 0.62$), directive language ($d = 0.25$), and suggestions ($d = 0.16$) than with negative statements ($d = -0.02$), giving information ($d = -0.12$), and miscellaneous measures ($d = 0.01$).

With the other tested moderators, significant influences were indicated for group size (see Tables 8 and 17). During peer interactions, gender differences were significantly larger in dyads ($d = 0.21$) than in groups ($d = -0.02$). Marginal effects were found for gender composition and method of recording. Gender differences in assertive speech were marginally more likely in same-gender interactions ($d = 0.18$) than in mixed-gender interactions ($d = 0.04$). Also, interactions that were videotaped ($d = 0.16$) produced larger gender differences than interactions that were coded on-site ($d = -0.01$).

Additional follow-up analyses. Analyses of the age level moderator for peer interaction indicated highly significant heterogeneity of effect sizes associated with two age levels of children: 24- to 71-month-old children, $Q_W = 63.97$, $p < .01$, and 72- to 119-month-old children, $Q_W = 55.56$, $p < .01$. Both of these age groups had sufficiently high numbers of studies ($k = 27$ and $k = 18$, respectively) for us to examine the five key contextual moderators (gender composition, activity type, group size, setting, and familiarity) within each of these two age levels.

Although gender composition was a marginal moderator when

Table 17
Comparison Tests of Moderator Variables of Gender Effects on Assertive Speech by Partner (Adults vs. Peers)

	Child–adult interactions				Peer interactions			
Moderator	*k*	*d*	95% CI	*r*	*k*	*d*	95% CI	*r*
Measurement independence								
Independent					19	0.04	−0.07–0.15	.02
Interdependent					37	0.15*	0.07–0.24	.08
First author gender								
Woman	7	0.18	−0.06–0.42	.09	46	0.11*	0.03–0.19	.05
Man	10	0.05	−0.12–0.21	.02	9	0.02	−0.11–0.15	.01
Type of recording								
Video	9	0.09	−0.11–0.28	.04	29	0.16*	0.06–0.25	.08
Audio	6	0.12	−0.08–0.31	.06	19	0.18*	0.01–0.34	.09
On-Site	2	−0.07	−0.60–0.46	−.04	8	−0.01	−0.14–0.11	−.01
Child age level								
24–71 months	9	0.07	−0.12–0.26	.03	27	0.13	0.00–0.25	.07
72–119 months	4	0.31	−0.01–0.62	.15	18	0.08	−0.03–0.19	.04
120–155 months	1	0.00	−0.44–0.44	.00	5	0.13	−0.05–0.30	.06
Over 156 months	33	0.01	−0.28–0.29	.00	6	0.12	−0.08–0.32	.06
Familiarity								
Stranger	2	0.35	−0.15–0.86	.17	6	0.32*	0.04–0.59	.16
Familiar	15	0.07	−0.07–0.21	.04	47	0.11	0.03–0.18	.05
Group size								
Dyad	11	0.06	−0.10–0.23	.03	26	0.21_a*	0.11–0.31	.10
Group	6	0.14	−0.09–0.36	.07	24	-0.02_b	−0.13–0.09	−.01
Gender composition								
Same gender	0				17	0.18*	0.06–0.30	.09
Mixed gender	0				22	0.04	−0.06–0.13	.02
Setting								
Lab	6	-0.17_a	−0.44–0.11	−.08	20	0.13*	0.00–0.26	.07
School	4	$0.10_{a,b}$	−0.21–0.40	.05	33	0.12	−0.01–0.16	.06
Home	5	0.28_b*	0.06–0.49	.14	2	0.00	−0.33–0.33	.00
Activity								
Unstructured	2	−0.25	−0.68–0.19	−.12	25	0.13*	0.00–0.26	.07
Structured	13	0.11	−0.04–0.26	.05	29	0.10	0.01–0.18	.05

Note. A negative effect size indicates that girls used more assertive language than boys. For each moderator, subscripts are shown when the variable was significant. Mean effect sizes (*d*) with different subscripts in the same column are significantly different ($p < .05$). CI = confidence interval.
* $p < .05$.

peer interactions of all ages of children were tested, it was a significant moderator of assertive speech for children 72 to 119 months of age, $Q_B(1) = 3.91$, $p < .05$. Effect sizes were larger in same-gender ($d = 0.25$, 95% CI = 0.05–0.45, $k = 6$) than in mixed-gender interactions ($d = 0.00$, 95% CI = −0.13–0.14, $k = 9$). As was seen when all ages were tested, group size was a significant moderator within both the younger age group, $Q_B(1) = 6.27$, $p < .05$, and the older age group, $Q_B(1) = 4.02$, $p < .05$. However, the patterns of gender differences varied according to both age and group size. Boys were more likely than girls to use assertive speech during dyadic interactions at the younger age level ($d = 0.18$, 95% CI = 0.04–0.32, $k = 14$) and the older age level ($d = 0.19$, 95% CI = 0.01–0.37, $k = 10$). However, girls used more assertive speech than did boys at the younger age level during group interactions ($d = -0.18$, 95% CI = −0.42–0.07, $k = 8$). There was a negligible gender difference in assertive speech at the older age level during group interactions ($d = -0.09$, 95% CI = −0.31–0.12, $k = 7$).

Partner familiarity was not a significant moderator for either the younger children, $Q_B(1) = 1.47$, *ns*, or the older children, $Q_B(1) = 0.27$, *ns.* At the younger age level, there were no significant influences of either observational setting, $Q_B(2) = 0.96$, *ns*, or activity type, $Q_B(1) = 0.45$, *ns.* Similarly, at the older age level, neither observational setting, $Q_B(1) = 0.53$, *ns*, nor activity type, $Q_B(1) = 1.08$, *ns*, was significant.

Summary

Boys were somewhat more likely than girls to use assertive speech. The results revealed an average gender difference that was statistically significant but negligible in magnitude. More substantial effect sizes ($d > 0.2$) were found when operational definition was taken into account. Group size was a significant contextual moderator, indicating that larger gender differences tended to occur when children were interacting in a dyad than when they were interacting in a group of three or more. When child–adult interactions were tested separately, there was only one significant moderator; gender differences in assertive speech with adults were larger when observed in the home than in research laboratories. When peer interactions were analyzed separately, some of the previously indicated moderators continued to be significant, including operational definition and group size. In addition, follow-up analyses of peer interactions at two specific age levels revealed a significant influence for gender composition for children 72–119 months of age. Of further note, the influence of group size differed when age level (early childhood vs. middle childhood) was also taken into account.

Discussion

We consider the impact of the various moderators on the likelihood and the magnitude of gender differences in language to be the most interesting and important story to emerge from the results. Hence, our discussion focuses mostly on the moderators. We also consider the relevance of the findings to possible explanations for gender-related differences in language and social behavior. However, we first review the general trends of average gender differences in language use from the three meta-analyses.

Overall Gender Differences

Three meta-analyses were carried out to examine possible gender differences in children's talkativeness, affiliative speech, and assertive speech. Average gender effects were statistically significant for all three language measures. Girls tended to be more talkative and to use more affiliative speech than boys. In contrast, boys tended to use more assertive speech than girls. However, the magnitude of the average effect size was negligible for both talkativeness ($d = 0.11$) and assertive speech ($d = 0.11$). A more meaningful average effect size was observed for affiliative speech ($d = 0.26$).

The finding that girls were more talkative than boys is consistent with the popular stereotype that women are more talkative than men (see James & Drakich, 1993) as well as with some research suggesting that girls are more verbally skilled than boys (Hyde & Linn, 1988). The observed gender effect parallels the finding from an earlier meta-analysis that compared mothers' and fathers' amounts of talking with their children. In that meta-analysis, Leaper et al. (1998) found a small average effect size ($d = 0.20$), with mothers being more talkative than fathers when interacting with their children. However, the observed gender difference in children's talkativeness in our meta-analysis contrasts with the pattern seen among studies of conversations between adults. According to James and Drakich's (1993) narrative review, the research tends to indicate that men are more talkative than women. The apparent age-related discrepancy may depend on differences in the way talk can be used. Among children, talkativeness may reflect variations in interpersonal engagement. In contrast, in adults, talkativeness may more often act as a signal of social dominance. Many of the adult studies comprised observations of strangers assigned tasks or topics to discuss. In these cases, men may have been more likely than women to interpret the context as a reason to take charge. In the child studies, observations were often based on free-play situations in which talk was used more as a way to form connections with the other person.

With regard to the observed average gender differences in affiliative and assertive speech, the results are compatible with prior characterizations of gender differences in children's social behavior. Girls' comparatively greater use of affiliative language and boys' relatively greater use of assertive language reflect the different emphases traditionally placed on each gender during development. The more likely use of affiliative language among girls is consistent with the communal and nurturant style often associated with girls' play and gender-typed norms. Conversely, the greater use of assertive speech among boys is compatible with the emphasis on dominance and instrumentality that is traditionally seen in boys' play and gender-typed norms (see Leaper, 1994; Maccoby, 1998; Maltz & Borker, 1982).

Although the overall average differences lend support to the notion that girls and boys may tend to act differently in their social interactions, we underscore the negligible-to-small range of the average effect sizes as well as the impact of methodological and situational moderators on the magnitude of the gender differences. The impact of the moderators is the focus of the next section.

Moderators of Gender Differences in Language Use

Notable effect sizes were detected with all three language constructs when particular moderator variables were taken into ac-

count. As elaborated below, developmental, situational, and methodological factors strongly influenced the extent and the manner with which girls and boys differed in their verbal communication.

Child Age Level

Age level was a significant moderator of average gender differences in talkativeness. Significant gender differences in talkativeness were seen only among the 1- to 2½-year-olds ($d = 0.32$). Thus, between 1 and 3 years of age, girls were significantly more talkative than boys. Some readers may interpret our result as consistent with prior indications that girls have a slight advantage over boys in language development (see Gleason & Ely, 2002) and verbal ability (see Hyde & Linn, 1988). Indeed, this age period is a time of rapid language acquisition when the child moves from one-word utterances to complex grammatical sentences (Brown, 1973). However, the same age period is also a time of gender learning (Martin et al., 2002) and socialization (see Leaper, 2002; Leaper et al., 1998). Therefore, readers may see support for either biological or social-developmental explanations. Regardless of whether the gender difference in talkativeness is due to maturational or to socialization influences, our results additionally suggest that boys have "caught up" with girls within a few years of age.

Child age was also a significant moderator of gender differences in children's affiliative language during peer interactions. There was a negligible and nonsignificant gender difference ($d = 0.06$) during middle childhood, that is, between 5 and 9 years of age. In contrast, there were substantial and statistically significant gender differences among the younger children between 2 and 5 years of age ($d = 0.51$) as well as among the older children between 10- to 12-year-olds ($d = 0.36$) and 13- to 17-year-olds ($d = 0.26$). This inverted-U shape pattern is consistent with the gender-intensification hypothesis (Hill & Lynch, 1983). Although some research indicates increasing flexibility in children's gender thinking from early childhood to adolescence (e.g., Katz & Ksansnak, 1994; Serbin et al., 1993), other studies find a return to gender rigidity during adolescence after a relative period of flexibility during middle childhood (e.g., Stoddart & Turiel, 1985). With the onset of adolescence, more rigid views of gender reemerge as social pressures to conform to adult sexual roles increase (Hill & Lynch, 1983). Perhaps the reemergence of a gender difference in affiliative speech during adolescence reflects a renewed concern among girls with the socioemotional behaviors traditionally prescribed more for women than for men. Admittedly, our interpretation is speculative. Whether or not it adequately explains the observed age-related patterns will depend on future longitudinal research specifically aimed at testing this interpretation. It is also worth noting that developmental changes in social behavior do not necessarily reflect corresponding changes in cognition.

Putting Gender in Context

The social-developmental and the social-constructionist perspectives were presented as two broad explanations for gender differences in the use of language. These two meta-theoretical views can be useful for interpreting the relative influences of individual factors that emerge during development (i.e., social-developmental interpretation) versus the demands of the immediate situation (i.e., social-constructionist interpretation). However, as acknowledged in our introduction, most contemporary theories reflect an implicit integration of both approaches. Just as most social-developmental theories allow for contextual influences (e.g., Bussey & Bandura, 1999; Martin et al., 2002), most social-constructionist theories acknowledge the impact of personal factors (e.g., Deaux & Major, 1987). Moreover, many of these same theories concede multiple levels of influence including biological, personal, interpersonal-contextual, and cultural (for excellent theoretical reviews, see Bussey & Bandura, 1999; Liben & Bigler, 2002; Martin et al. 2002). Yet there is no single theory that has provided an *explicit and detailed* model of how all of these levels are interrelated. Toward this goal, we hope to use the present findings to begin to consider ways to integrate social-developmental and social-constructionist approaches in a more explicit manner. It is beyond the scope of our findings, however, to present more than a few suggestions that may possibly stimulate future thinking and research.

One aspect of the interactive context that affected the likelihood and the magnitude of a gender difference in talkativeness was whether the child was interacting with a peer or an adult. There was no average gender difference during peer interactions. However, girls talked significantly more than boys in child–adult interactions. There is a parallel finding in an earlier meta-analysis of gender differences in parents' speech. Leaper et al. (1998) reported that mothers tended to be more talkative with daughters than with sons. Therefore, one interpretation is that the observed child gender difference in talkativeness was partly an artifact of the adult's influence. For example, if mothers (and other adults) talk more to girls than to boys, then girls may talk more in return. Alternatively, earlier findings regarding mothers' differential talkativeness to daughters and sons may have been partly an artifact of the child's behavior (e.g., see Bell, 1968). Girls tend to acquire language earlier than do boys (see Gleason & Ely, 2002), and therefore girls may be more likely than boys to initiate talk. Finally, a third—and most likely—possibility is that adults and children mutually influence one another's amount of talking (e.g., see Riegel, 1976). Regardless of the causes, one potential consequence is that girls may be more likely than boys to practice a talk-oriented approach to social interaction during early childhood that strengthens any initial predisposition in this direction. However, the meta-analysis indicated that this pattern did not generalize to social interactions with peers. There was not a significant average gender difference in talkativeness during peer interactions. (But, as we discuss later, there was a specific peer context in which girls were more talkative than boys.)

In addition to the interaction partner (adult vs. peer), other contextual moderators included the familiarity between the participants, group size, gender composition, the observational setting, and the type of activity. The results indicated that each of these factors moderated the likelihood and the magnitude of gender differences in language use. We review these findings next.

According to Deaux and Major's (1987) contextual model, people are more likely to fall back on gender scripts to guide their behavior in unfamiliar settings than in familiar settings. In uncertain social situations, gender becomes a readily available (and well practiced) schema for guiding people's expectations (e.g., W.

Wood & Karten, 1986). Many of the observed gender effects in the meta-analyses were more likely in unfamiliar or ambiguous social settings.[3] One of these findings was that average gender differences in assertive speech were somewhat more likely during peer interactions with strangers than with familiar partners (i.e., classmates or friends). When interacting with strangers, children's concerns for self-presentation may be heightened because they anticipate negative sanctions for cross-gender-typed behavior (Banerjee & Lintern, 2000). The fact that the familiarity effect occurred with assertive speech—a style that is gender-typed for boys—is consistent with studies finding more self-presentation concern about gender among boys than among girls (see Banerjee & Lintern, 2000; Leaper, 1994). Thus, boys may be especially likely to rely on traditional gender scripts when interacting with an unfamiliar partner. The apparent greater salience of gender during interactions with strangers is compatible with the social-constructionist view. At the same time, developing gender-related self-presentation concerns presumes some sort of socialization.

Group size is another factor that may affect the salience of gender (Deaux & Major, 1987). As the size of a group increases, peer norms become more prominent (J. Harris, 1995). Consistent with this proposal, the average gender difference in talkativeness among peers tended to be larger in groups than in dyads (at a marginally significant level). However, contrary to the argument, gender differences in assertiveness among peers occurred only in dyadic interactions. To the extent that larger groups may elicit more competition (Benenson, Nicholson, Waite, Roy, & Simpson, 2001)—and with it more assertive speech—perhaps girls and boys alike increased their use of assertive speech to maintain their position in groups. Consistent with a social-constructionist account, this implies that if girls and boys are each put in similarly competitive situations, they will act in similar ways. In contrast, dyadic peer interactions are less likely to be competitive. In less competitive (i.e., more relaxed) situations such as one-on-one interaction, perhaps average differences in girls' and boys' preferred communication styles are more likely to be observed. In dyadic interactions, girls may be less likely than boys to use power-assertive strategies and more likely to use collaborative strategies (Leaper, 1991, 1994). This latter interpretation is more consistent with the social-developmental explanation. Thus, socialized behavioral tendencies may be either more or less likely depending on the particular social context (Bussey & Bandura, 1999).

Next, there was some evidence that the gender composition in peer interactions affected the magnitude and the direction of gender differences in language use. The influence of gender composition depended on the language construct and the child's age level. Gender composition was a moderator of gender differences in affiliative speech among samples of preschool-age children. Although a sizable average gender difference in affiliative speech occurred during same-gender peer interactions ($d = 0.61$), a difference of much larger magnitude occurred during mixed-gender peer interactions ($d = 1.27$). Thus, it appears that when young girls and boys interact, the average gender difference in the likelihood of using affiliative speech becomes greater than when they interact with same-gender peers. This implies that more of the burden of the "interaction work" is being carried by the girls than by the boys during mixed-gender interactions. A few possible interpretations occur to us. One possibility is that boys may be more likely than girls to withdraw during cross-gender interactions. Also, boys may defer more to girls in order to make the interaction work (see Fishman, 1983). Alternatively, boys may be less socially skilled than girls during early childhood (see LaFreniere & Dumas, 1996), and gender differences in affiliative speech may become more apparent when the two genders are interacting. These speculations will require further study.

Gender composition was additionally implicated as a moderator of gender differences in assertive speech among school-age children. At this age level, significant gender differences in assertive speech occurred during same-gender interactions ($d = 0.25$) but not during mixed-gender interactions ($d = 0.00$). The results therefore suggest that shared gender norms may have had a stronger impact than did gender differences in power and status among the older children (see Carli, 1990). That is, among the older (but not the younger) children, boys' greater likelihood of using assertive speech tended to occur within the context of being with others from the same peer "culture." This pattern suggests the possible impact over time of boys' socialization into the norms of the traditional male peer group with its emphasis on self-assertion and dominance (see Leaper, 1994; Maccoby, 1998; Maltz & Borker, 1982).

It is still possible that gender-related differences in power and dominance could underlie an apparent absence of a gender difference in mixed-gender settings. This was suggested by one of the studies included in the meta-analysis. When investigating how girls and boys handled conflicts, P. M. Miller, Danaher, and Forbes (1986) found that gender differences were more likely when they compared conflicts between same-gender peers than mixed-gender peers. During same-gender peer conflicts, boys were almost three times more likely than girls to use power-assertive strategies (22% vs. 8%, respectively). In contrast, during cross-gender peer conflicts, boys and girls used similar amounts (30% vs. 24%, respectively). The greater similarity during the mixed-gender conflicts reflects the fact that girls used more power-assertive strategies with boys relative to their rate with same-gender peers. Boys, in contrast, used similar rates regardless of the partner's gender. Thus, one interpretation for the absence of a gender difference during cross-gender conflicts in P. M. Miller et al.'s study was that girls realized that to influence boys they needed to play by the boys' rules (see Serbin, Sprafkin, Elman, & Doyle, 1982, for a similar finding).

The impact of gender composition as a moderator of gender differences in assertive speech may change yet again during adulthood. The magnitude of differences between women's and men's use of assertive speech may be greater in mixed-gender than in same-gender interactions as a manifestation of men's dominance

[3] We were unable to test whether a contextual moderator influenced one gender more than the other. Comparisons of effect size can only test for relative differences between conditions in the magnitude of gender difference. For example, consider the finding that significant gender differences in assertive speech were seen during peer interactions with strangers but not during peer interactions with familiar partners. One possibility is that girls, but not boys, are acting differently in the two contexts. Girls may tend to decrease their use of assertive speech when with strangers, whereas boys may not. An alternative possibility is that boys, not girls, were responding differently to the two situations. Boys may tend to increase their use of assertive speech when with strangers, whereas girls may not.

and women's deference. Although Carli (1990) provided support for this pattern in her study, there is no corresponding meta-analysis to test how reliable it might be. The ways in which cross-gender relations may undergo change over the life span deserve additional study (see Leaper & Anderson, 1997; Monsour, 2002).

Two other aspects of the interactive context that we considered were the setting where the study occurred and what the children were doing when observed. With regard to the physical setting, there was only one significant effect. Boys used more assertive speech than did girls when interacting with adults at home (d = 0.28) than when interacting with adults in a lab (d = −0.17). Presumably, both parents and children are more likely to feel at ease in their homes than in a strange research laboratory. Thus, the finding suggests that the home environment may be a context in which many boys learn to feel entitled to act assertively (see Leaper, 2002).

Finally, the type of activity was a significant moderator implicated in the analyses. In the present meta-analysis, girls' greater use of affiliative speech was more pronounced in unstructured activities (d = 0.58) than in structured activities (d = 0.21). In unstructured situations, girls and boys often select different types of activities. For example, girls tend to engage in play activities that are talk-oriented and emphasize nurturance (e.g., playing house), whereas boys are more likely to participate in activities with a more instrumental focus (e.g., sports). When engaged in similar activities, however, girls and boys tend to act in similar ways (e.g., Leaper, 2000a). Gender-typed activities (as well as most neutral activities) have underlying scripts that make certain communication styles more likely than others. The way a child talks when playing with a tea set is going to be different than when playing baseball. Although the powerful impact of the activity on children's language lends support to the social-constructionist account, it is also true that parents, peers, and the media may encourage and reinforce children's preferences for gender-typed activities. Thus, children's participation in gender-typed activities can be interpreted as a mediating process underlying gender socialization (see Bussey & Bandura, 1999; Etaugh, 1983; Leaper, 2000a, 2000b, 2002; Liss, 1983). That is, children will view certain activities as relevant for their in-group (Martin & Ruble, 2004) and subsequently gain more practice in behaviors associated with these activities (Bussey & Bandura, 1999). In these ways, the social-constructionist and the social-developmental explanations can be viewed as complementary (Leaper, 2000b).

Operational Definition

Identifying the influences of methodological factors provides potentially useful information for researchers to consider when designing future studies. Of particular note is that operational definition proved to be a significant moderator of gender differences in both affiliative and assertive speech. As highlighted in typical research methods textbooks (e.g., Bordens & Abbott, 2002), how an investigator measures a construct can influence the findings that are detected. The present meta-analyses underscore this point. With affiliative speech, effect sizes were particularly strong for responsiveness (d = 0.41) and for general definitions (d = 0.35). In contrast, effect sizes were relatively negligible (d < 0.2) for acknowledgment, praise, or agreement. That the largest gender difference was associated with responsiveness is consistent with studies of adult gender differences in communication, where it has been observed that women are more likely than men to demonstrate active understanding (e.g., Leaper, Carson, Baker, Holliday, & Myers, 1995; J. T. Wood, 2001). Furthermore, responsiveness was the form of affiliative speech we investigated that most involved being *both* affiliative and assertive. With most measures of responsiveness, the speaker elaborates and builds on the partner's previous comment. In this way, the speaker influences the course of the social interaction in a proactive way (see Leaper, 1991). To underscore, people can express assertion and affiliation simultaneously—and this type of communication (responsiveness) was more likely for girls than boys. (All of the forms of assertive speech acts that we examined were high in assertion but low or only moderate in affiliation.)

Larger effect sizes also occurred in our analyses of assertive speech when specific operational definitions were examined. Larger effect sizes were especially seen for general definitions of assertive speech (d = 0.37) and directives (d = 0.23). In contrast, effect sizes were in the negligible range (d < 0.2) for suggestions, disagreements, giving information, requests for information, and negative speech. Thus, if we exclude the general measure, directive speech was the only specific form for which a meaningful effect size was seen. It appears, therefore, that greater gender differences were related to the use of power-assertive speech (i.e., directives) than to task-oriented forms of assertion (i.e., suggestions, giving information). These findings imply that power and dominance may be more central in American boys' traditional gender development. By contrast, being agentic or instrumental in less domineering ways may be equally likely for girls and boys.

Other Methodological Moderators

Other procedural factors influenced whether researchers detected a gender difference in language use. One of them was measurement independence. That is, for studies of peer interactions, we contrasted studies that based their analyses on only one child per social interaction (independent measures) versus those that measured the speech of all the children in a dyad or group (interdependent measures). To our knowledge, this is the first meta-analysis of social behavior to test this distinction as a moderator. This methodological choice did not appear to matter among studies of gender differences in assertive speech; and it had only a marginal influence on gender differences in talkativeness. However, it did significantly moderate effect sizes associated with affiliative speech. Substantially larger effect sizes occurred in studies that used interdependent measures (d = 0.39) than in studies that used independent measures (d = 0.19). The fact that interdependent measures were associated with larger effect sizes may partly reflect the tendency for affiliative speech to be reciprocated. For example, this tendency has been indicated in sequential analyses examining exchanges between speakers (e.g., Leaper, 1991; Leaper et al., 1999).

A second implicated methodological moderator was how the social interactions were recorded and coded. Average gender differences in affiliative and assertive language were statistically significant when interactions were videotaped or audiotaped but not when interactions were coded on-site. Of the three methods, videotaped recordings presumably offer the most accurate means

of measuring social behavior because the researcher can make repeated viewings of both the verbal content and the nonverbal context (Bordens & Abbott, 2002). However, at least one prior study suggested that under certain observational conditions, on-site coding can be more accurate than videotaping (Fagot & Hagan, 1988). The latter pattern tended to occur with regard to gender differences in talkativeness. Studies finding girls more talkative were more likely when on-site coding was used ($d = 0.15$) than when videotape recording was used ($d = -0.15$). Both effect sizes were negligible in magnitude, and therefore it is unclear whether this result has much practical significance.

Next we tested year of study as a moderator to assess possible cohort changes in the likelihood or the magnitude of gender differences in language use. As gender-typed expectations have become more flexible over the past few decades (Twenge, 1997), one might expect gender differences in social behavior to be declining among children. This would be indicated by a pattern of decreasing effect sizes over the years. However, this pattern was not found. Year of study was not correlated with gender effects for either talkativeness or affiliative speech. And there was a *positive* correlation between year of study and effect size for assertive speech. In particular, in child–adult studies, reports of gender differences in assertive speech have increased over the years. If there is a historical change, it appears that boys are becoming more likely to use assertive speech with adults (most likely with mothers) than are girls. An alternative interpretation is that the effect is due to changes in methodology over time. In any case, it is an unexpected finding that should be viewed cautiously.

Author gender is the only methodological factor we tested that did not prove to be a significant moderator in any of the three meta-analyses. Despite some prior meta-analyses indicating that women and men tended to differ in the likelihood of reporting significant gender differences (e.g., Eagly & Carli, 1981; Leaper et al., 1998), this tendency was not seen here.

Conclusions

Our findings suggest several ways in which the immediate context as well as socialized gender norms affect the likelihood and the magnitude of gender differences in children's language use. In these ways, we found support for both the social-constructionist and the social-developmental explanations for gender differences. Whereas these two approaches are often viewed as competing paradigms (e.g., Kimmel, 2004; Thorne, 1990), we propose that they can be viewed as complementary perspectives. Together, they provide a more thorough understanding of gender development (see Leaper, 2000b). Consistent with the social-constructionist interpretation, any number of studies with children and adults have highlighted how situational demands can account for many gender-related differences in social behavior. However, girls' and boys' systematic exposure to different opportunities over time are likely to lead to corresponding gender differences in developmental outcomes. Children will begin to infer commonalities about the gender-typed contexts they regularly experience that will shape their gender schemas, values, and knowledge structures (Martin & Ruble, 2004). Also, to the extent that girls and boys regularly experience different contexts, they are likely to develop different preferences and skills (Bussey & Bandura, 1999).

One of the corollaries of the social-constructionist view is that gender differences reflect relative status and power differences between women and men. In contrast to the results of adult studies (e.g., Carli, 1990; W. Wood & Karten, 1986), we did not find much evidence suggesting the influence of gender as a status characteristic on the likelihood of gender differences in children's language use. For example, we did not find boys using more assertive speech than girls during mixed-gender interactions (cf. Carli, 1990). Although this type of influence was not apparent from our analyses, there are studies indicating that children do recognize the higher status associated with males in our society (see Bussey & Bandura, 1984; Lockheed, Harris, & Nemceff, 1983). More research is needed that focuses on whether and how these perceptions affect children's and adolescents' social interactions.

Our meta-analysis was not particularly well suited to addressing possible biological influences on gender-related variations in children's language use. There is indisputable evidence that biological factors account for at least some of the gender-related variations in certain cognitive and social behaviors (see Halpern, 2000). What remains debatable is the *amount* of this influence. There are few if any researchers in the field who would argue that biological predispositions are immutable in the face of environmental influences. Situational demands often trump personal tendencies. Also, socialization practices can weaken or counter the influences of some biological predispositions. Nonetheless, to best understand all factors contributing to gender-related variations in social behavior, it behooves us to explore whether and how biological factors play a role. For example, one interesting direction would be to consider the possible impact of gender-related variations in temperament as a possible mediator underlying some gender differences in social behavior (e.g., Fabes, Shepard, Guthrie, & Martin, 1997; Knight, Guthrie, Page, & Fabes, 2002).

Another limitation of the present set of meta-analyses was our inability to consider culture, ethnicity, socioeconomic status, or family structure as possible moderators. The socioeconomic and cultural backgrounds of individuals are potentially important moderators of gender-related variations in social behavior (e.g., Leadbeater & Way, 1996). Similarly, variations in family structure, such as household structure, can affect children's gender development (see McHale, Crouter, & Whiteman, 2003). However, the available study samples were predominantly limited to those from middle-class European American backgrounds. Also, information about children's family structure was not typically provided in studies of peer interactions. Therefore, children's backgrounds could not be tested as possible sources of influence. As developmental researchers continue recent trends toward studying social interactions among children from more diverse backgrounds (e.g., Filardo, 1996; Hubbard, 2001; Kyratzis & Guo, 2001; Leaper, Leve, Strasser, & Schwartz, 1995; Leaper et al., 1999; Scott, 2002), future reviews may be able to consider the intersection of gender, ethnicity, socioeconomic class, and family structure during children's development.

To best understand the development of gender, we will need to better formulate an integrative systems view that takes into account biological, individual, interpersonal, institutional, and cultural factors. Of course, addressing all levels of influence in a single study is probably beyond our present conceptual and methodological abilities. However, researchers are now more likely to

consider two or more levels within a single study. For example, in the developmental psychology of gender, there have been studies considering both biological and interpersonal factors (e.g., Brennan, Hall, Bor, Najman, & Williams, 2003; Susman & Ponirakis, 1997) as well as other studies examining interpersonal, social-structural, and cultural factors (Carlo, Roesch, Knight, & Koller, 2001; Huston, McLoyd, & Garcia Coll, 1997; Killen, Lee-Kim, McGlothlin, & Stangor, 2002). To the extent that more links between levels of analysis are made within individual studies, it will become easier for us to synthesize the bigger picture in future reviews and theoretical models of gender development.

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