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**“H, I, J, K, L, M, N, O, PEE! Get it? Pee!”: Siblings’ Shared Humour in Childhood**

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### Abstract

Humour is a central feature of social interactions in childhood that has received little attention. In a sample of 86 7-year-old children ( $M$  age = 7.82 years,  $SD$  = 0.80), we investigated patterns and individual differences in spontaneous humour observed during free play with their older ( $M$  age = 9.55 years,  $SD$  = 0.88) or their younger sibling ( $M$  age = 5.87 years,  $SD$  = 0.96). We coded children's instances, categories, and responses to humour. We investigated the nature of children's humour on the dyadic and individual level. Humour was common, and siblings' production of humour was highly interdependent between play partners. Dyadic humour differed according to structural features of the sibling relationship (age, gender composition), and 7-year-old focal children's humour varied according to gender. This study contributes to knowledge regarding the dyadic nature of children's humour and individual patterns of humour beyond the preschool years.

Keywords: Humour; middle childhood; siblings; observational study.

**“H, I, J, K, L, M, N, O, PEE! Get it? Pee!”: Siblings’ Shared Humour in Childhood**

Humour is a universal aspect of human experience (Martin, 2007) and a central feature of children’s playful, warm, and intimate relationships (Bergen, 2002). Humour serves important and dynamic social and emotional functions: humour increases group cohesiveness and interpersonal relations, enables challenging or difficult views to be expressed, and importantly, humour often results in positive emotions and laughter (Fox, Hunter, & Jones, 2016; Martin, 2007; Masten, 1986; McGhee, 1979). Indeed, certain styles of humour are associated with adjustment in childhood and in later years (Fitts, Sebby, & Zlokovich, 2009; James & Fox, 2018). Certain uses of humour may help children cope with fear, anxiety and worries; humorous children may also be better at maintaining positive social relationships (Masten, 1986; Ransohoff, 1975), and understanding the minds of others (Hoicka & Ahktar, 2012). Although the sibling relationship is an important context for children’s developing social understanding (Carpendale & Lewis, 2015) and their shared humour (Dunn, 1988), children’s spontaneous, shared humour with their siblings has received little empirical study. Therefore, it is crucial that more studies address the dearth of research regarding the nature of humour in childhood and within sibling interactions. In this observational study, we investigated children’s humour with older and younger siblings in middle childhood.

**Humour Production in Childhood**

Humour is characterised by *incongruity* (McGhee, 1979; Shultz, 1976), or *wrongness* (Hoicka, Jutsum, & Gattis, 2010), in that it involves an intentional violation of some expectation about reality. Types of humour vary, from unexpected movements (e.g., face contortions) and using objects in unconventional ways (e.g., putting boxes on feet) to play with language (e.g., puns and riddles; Bergen, 2006). Humour is also social and typically dyadic in nature (Hoicka &

Akhtar, 2012), in that an integral part of humour production is the performer's communication of their intentional incongruous behaviour or ideas (Leekam, 1991), and that humour is shared with others with anticipatory looking, smiling, and laughter (Hoicka & Akhtar, 2012). Indeed, within a humorous exchange the 'performer' must understand that their 'audience' will be able to differentiate between their sincere and humorous intentions. As such, humour may reveal a great deal about what children understand about others' minds (Hoicka & Akhtar, 2012; Leekam, 1991); an essential part of comprehending and navigating the social world (Carpendale & Lewis, 2015).

From the first year of life, children laugh if people or objects behave in unusual or unexpected ways (Sroufe & Wunsch, 1972). Observational studies also show infants produce humour by playing peekaboo (Hoicka & Akhtar, 2012) and displaying clowning behaviours (e.g., head wagging) that are sensitive to the positive responses of adults (Mireault et al., 2011; Reddy, 2001). From the toddler years, children increasingly demonstrate novel humorous acts, such as object misuse, gestures and positions, and playful rule violations (Hoicka & Akhtar, 2012; Loizou, 2005). With children's emerging verbal ability also comes play with language, for example object mislabelling (e.g., calling a dog a cat), assigning incongruous characteristics (e.g., cat says "woof"), and producing nonsense words (e.g., gobbledegook; Hoicka & Akhtar, 2012; Johnson & Mervis, 1997).

Recently, there is increased attention to the developmental changes in children's humour production in early childhood (e.g., Hoicka & Akhtar, 2012). Observation of preschoolers demonstrates that children's humour includes sound play, such as 'silly' rhyming (e.g., "teenie, weenie, beanie,") nonsensical adaptations of known words (e.g., "pajoodles" instead of "pajamas."), and over-exaggerated tones of voice, for example speaking in a gruff or squeaky

voice (Bergen, 2002; Garvey, 1977; Gesell & Ilg, 1946). Taboo and teasing also emerge as themes in children's humour production, such as saying forbidden, insulting or disgusting words/ and phrases (e.g., "poop," "Mr. Piggyface"; Dunn, 1988) and banter (e.g., playfully distracting another child by poking them; Bergen, 2002; McGhee, 1979). Early research indicates that from six years of age, children produce more complex humorous word play, by telling jokes and riddles that centre upon double meanings (e.g., "He did not have enough dough [money]."; McGhee, 1979; Shultz & Pilon, 1973). There remains, however, a paucity of observational studies examining children's humour production beyond age four (Bergen, 2008). This is surprising, given the proposition that beyond the preschool years, children's humour increases in complexity and gradually begins to resemble adult humour due to children's developing cognitive abilities (see McGhee, 1979). Therefore, one overarching goal of this study was to describe humour production in this otherwise overlooked age-range, at a time when children are developing more sophisticated cognitive and social skills.

### **Humour Production in Children's Close Relationships**

While humour is thought to originate as a private experience, from an early age, children are motivated to share humour with others (McGhee, 1979). Children's early humour production is typically studied in the context of interactions with the mother (Hoicka & Akhtar, 2012; Mireault et al., 2011). Yet, by middle childhood, children spend considerable time playing with siblings (Lehrer, Petrakos, & Venkatesh, 2014). While few studies investigate humour within sibling interactions, Dunn's (1988) early work indicated children's interactions during sibling play offers a rich context for the study of humour production.

For many individuals, the sibling relationship is the most long-term relationship over the lifespan, and can be characterised by enduring closeness, play, and cooperation, as well as

frequent conflict (Dunn, 1994; Hughes, 2011). It is well established that different features of children's interactions with their siblings foster their social understanding abilities (e.g., conflict, pretend play; Hughes, 2011). Yet, little attention is paid to shared sibling humour. In one exception; Dunn (1988) observed that children's jokes with their siblings typically focus on the forbidden, insulting or disgusting, often in repetitive, ritualistic conversational exchanges. The intimacy and permanency of the sibling relationship is likely to result in a rich context for humour production, enabling siblings to share in the moments of comedy and absurdity that are encountered in day-to-day family life and to explore the boundaries of what each other may (and may not) find funny without jeopardizing the relationship (Dunn, 1988; Hughes, 2011).

*Sibling constellation factors* (e.g., age, gender and birth order) affect features of sibling interactions (AUTHORS, 2011), and therefore may influence their humour production. Due to the lack of research on structural features of sibling relationships and humour production (McGhee, 1979), our insights come from the literature on play, argued to be conceptually connected to humour (see Bergen, 2002). This literature demonstrates older sibling dyads use more sophisticated and positive play strategies, whereas younger dyads are less successful at creating shared meanings in play (AUTHORS, 1998; AUTHORS, 2005). With their experience and more advanced sociocognitive skills that come with age (Wellman, Cross, & Watson, 2001), it is expected that older sibling dyads would similarly produce humour more frequently and demonstrate more advanced types of humour (e.g., word play) than younger dyads.

The nature of boys' and girls' humour production starts to diverge as children reach middle childhood (McGhee, 1979). While both boys and girls increasingly enjoy sharing jokes and riddles with age, generally boys demonstrate more frequent attempts of humour than girls, can produce more jokes when asked, and additionally show more laughter during social play

(McGhee, 1979). In terms of gender composition, same-gender sibling dyads are characterised by more play, conversation, positivity and intimacy than opposite-gender dyads (Burhmester, 1992; Kim, McHale, Osgood, & Crouter, 2006), which in turn are characterised by more conflict (Dunn & Kendrick, 1982). Taken together, we expected male same-gender dyads would produce more humour and have more positive responses to humour than female same-gender dyads and mixed-gender dyads.

In investigations of birth order and play, later-born children demonstrate more proficiency in constructing shared meanings in play (AUTHORS, 2005). It is well-documented that older siblings foster their younger siblings' sociocognitive skills (e.g., Ruffman et al., 1998), perhaps by scaffolding their younger sibling to reach higher levels of cognitive functioning (Vygotsky, 1978). Similarly, older siblings may scaffold their younger siblings to produce more humour during interactions. However, evidence also suggests that having a younger sibling presents an advantage in children's social understanding skills in middle childhood (AUTHORS, 2018). In contrast to later-borns, firstborns' superior cognitive abilities enable them to guide play scenarios (DeHart, 1999); however, they also demonstrate more controlling behaviours that signal a breakdown in play (AUTHORS, 2005). Based on this work, we expected that birth order is likely to influence humorous exchanges between siblings.

### **The Present Study**

In the present study, we aimed to expand upon a very limited literature by investigating the nature of children's humour in middle childhood. As humour is social in nature (McGhee, 1979), we investigated 7-year-olds' humour within the context of play with a sibling. While 7-year-olds' humour may be determined by their own tendency to employ humour within social interactions, possibly this behaviour occurs in response to their siblings' humour (see *partner*



*effects*, Kenny & Malloy, 1988). As such, prior to examining 7-year-olds' humour, we first investigated dyadic patterns of sibling humour, including partner effects on humour, and how sibling dyads' humour may differ according to dyadic features of the relationship (age groups and gender composition). We expected that (1) older sibling dyads would produce more frequent and complex humour than younger dyads (AUTHORS, 2005) and (2) that same-sex male dyads would produce and positively respond to humour more than those in other gender compositions (Kim et al., 2006; McGhee, 1979).

Following an exploration of shared humour at the dyadic level, we investigated 7-year-olds' spontaneous humour and differences in their humour according to gender and birth-order. Based on literature concerning children's play and humour production, we expected (3) that males would produce more humour than females (McGhee, 1979). We also explored differences in humour according to whether 7-year-olds were a younger or older sibling.

## **Method**

### **Participants**

Eighty-six families participated in a study of childhood relationships. Ethical approval was obtained for the procedures from the XXXX Human Research Ethics Committee. The participants were from middle-class families from small towns and suburban communities in western New York and were representative of the local community. Focal children ( $M$  age = 7.82 years,  $SD = 0.80$ ) were observed as they interacted with a younger or older sibling. Focal children (7-year-olds) were labelled as older or younger according to their relation to the other sibling who participated in the study. Forty-four focal children were observed with a younger sibling ( $M$  age = 5.87 years,  $SD = 0.96$ ) and 42 with an older sibling ( $M$  age = 9.55 years,  $SD =$

0.88). The sample comprised 55 same-sex (28 brothers, 27 sisters), and 31 mixed-sex sibling dyads (17 brother-sister, 14 sister-brother).

### **Procedure**

Children were video recorded in the home for 15 minutes playing with their sibling and were randomly given either a village set ( $n = 42$ ) or a train set ( $n = 44$ ). The research assistant told each dyad they could play with the toys as they wished, before leaving the room to sit with the mother. Following the visits, the children were given a small toy from a box of prizes and families were offered copies of the video recordings as a memento. Children's language and behaviour was later transcribed from the video records by research assistants who were not involved in data collection and blind to the purpose of the study.

### **Measures**

**Coding humour.** The observational coding scheme for children's humour was based on humour types noted by Bergen (2006) and Hoicka and Akhtar (2012). Firstly, children's bouts of humour were identified, within which children's *instances of humour* were counted and coded by category. Multiple categories of humour could occur within a single humorous instance. Children's humorous categories included: (a) *performing incongruities*; (b) *word play*; (c) *sound play*; (d) *banter*; (e) *taboo*; and (f) *clowning* (see Table 1). Analysis of internal consistency of all the humorous categories yielded a Cronbach  $\alpha$  of 0.77. An independent observer coded humour production for 17/86 randomly selected video recordings (20%). Good interrater reliability was established for identification of humorous bouts (82% agreed humorous bouts) and for coding of categories (median intraclass correlation [ $ICC$ ] = 0.92).

Given that children's responses to humour may differ according to features of the sibling relationship, we coded children's responses to humour using a scheme adapted for coding

children's responses to sibling imitation during free play (AUTHORS, 2018). Children's responses to humour included: (a) *no response*; (b) *positive/neutral*; (c) *negative*; (d) *clarification*; (e) *imitation*; and (f) *extension* (see Table 2). These responses to humour (b – f) could co-occur. An independent observer also coded responses to humour production for 17/86 randomly selected video recordings (20%) to establish interrater reliability for response categories (median *ICC* = 0.82). Table 3 shows a coded example of a humorous exchange between siblings.

**Conversational turns.** Differences between groups in humour production could be explained by the level of children's engagement with each other and the task. Therefore, the number of children's conversational turns were included as a measure of their engagement and was determined by counting the number of conversations between children. If there was a break in the speech of one child for more than 3 seconds, a new turn was counted.

## Results

### Data Analysis

We first describe characteristics and mutual influences of humour within the sibling dyads and investigate the impact of structural features of sibling relationships (dyad age group and gender composition) on humour shared within the dyad. Next, we describe the nature of 7-year-old focal children's humour within children's interactions with their sibling and individual differences according to child-related factors (gender and birth-order).

All coded measures were transformed for analysis. To control for slight variability in video length, proportion scores were created by dividing each outcome by the number of minutes in each session. The summary measures in the present study include: (1) counts of dyad/7-year-olds' total humorous instances per minute; (2) counts of instances of dyad/7-year-olds' humorous

categories per minute (word play, sound play, performing incongruities, taboo, banter, and clowning); (3) counts of the dyad/7-year-olds' responses to humour per minute (no response, positive/neutral, negative, imitation, and extension). To adjust for skewed distributions, humour codes were square root transformed; descriptive statistics reflect these transformed variables. Due to low counts of clarification responses, this category was dropped from subsequent analyses, but is shown descriptively. Total dyads'/7-year-olds' conversational turns were also transformed into count per minute for inclusion as potential covariates of children's humour production.

Analysis of covariance (ANCOVA)-based procedures were used to test group differences in humour within dyads according to sibling relationship features (dyad age group: 'seven and younger' or 'seven and older'; gender composition: female-female, male-male, or mixed gender) and subsequently, to test individual differences in 7-year-olds' humour (gender, birth-order). Post hoc pairwise comparisons were investigated using the Bonferroni correction (where  $p < 0.05$ ). Effect sizes are reported as partial eta-squares ( $\eta_p^2$ ).

### **Dyadic Patterns of Humour between Siblings**

Humour was common: 915 instances of humour were coded. On average, sibling dyads spent 9% of the observation with one or both children engaged in humour. Of the 86 dyads, 78 (90.7%) produced humour: in most dyads, both children produced humour ( $n = 66$ , 76.7%), and less commonly, just one child in the dyad produced humour ( $n = 12$ , 14.0%). Across the dyads, humour occurred at a mean of 0.79 instances per minute ( $SD = 0.51$ , range 0 to 2.42). Table 4 shows the humour categories and responses within the dyadic interactions. Over half of instances of humour produced were met with a response (58.8%). When children in the dyad responded to humour, 28.0% included humour. Within dyads, children produced a mean of 9.18

conversational turns per minute ( $SD = 3.66$ ), which was significantly associated with production of humour within the dyad ( $r = .46, p < .001$ ). More humour was produced during play with the village ( $M = 0.96, SD = 0.51$ ) than train set ( $M = 0.63, SD = 0.46$ )  $t(84) = 3.22, p = 0.002$ .

Therefore, dyadic conversational turns and play set were controlled in subsequent analyses.

### **Differences in Humour between Sibling Dyads**

We expected 'seven and older' sibling dyads to produce more frequent and complex humour than 'seven and younger' sibling dyads. Unexpectedly, a one-way ANCOVA showed no significant differences in total instances of humour between sibling dyads by age group,  $F(1, 82) = 2.23, p = .14$ . However, a one-way MANCOVA revealed a significant main effect of dyad age group on humour categories used by dyads, Wilks'  $\lambda = .85, F(6, 77) = 2.20, p = .05, \eta_p^2 = .15$ , where 'seven and younger' sibling dyads produced more sound play than 'seven and older' dyads ( $p = 0.009, M = 0.47, SD = 0.43$  and  $M = 0.29, SD = 0.34$ , respectively) (Figure 1a). In terms of dyads' responses to humour, a one-way MANCOVA showed no main effect of age group, Wilks'  $\lambda = .91, F(5, 78) = 1.62, p = .16$ .

We investigated differences in dyads' humour as a function of gender composition (female-female, male-male, mixed gender); as expected, same-sex male dyads produced more humour. A one-way ANCOVA showed a significant main effect of dyad gender composition on total instances of humour  $F(2, 81) = 8.40, p < .001, \eta_p^2 = .17$ . Pairwise comparisons revealed that male-male dyads ( $M = 1.02, SD = 0.61$ ) produced significantly more instances of humour than female-female dyads ( $M = 0.61, SD = 0.61$ ) (mixed gender  $M = 0.75, SD = 0.44$ ). In a test of gender composition on categories of dyads' humour, a one-way MANCOVA indicated a main effect of gender composition on humour categories, Wilks'  $\lambda = .70, F(12, 152) = 2.47, p = .006, \eta_p^2 = .16$ . Pairwise comparisons determined that male-male dyads performed more incongruities

than female-female and mixed dyads ( $p < .001$  and  $= .004$  respectively), male-male dyads produced taboo humour and clowned more than female-female dyads ( $ps = .01$  and  $.02$  respectively) (Figure 1b). A one-way MANCOVA showed no main effect of dyad gender composition on dyadic responses to humour, Wilks'  $\lambda = .81$ ,  $F(10, 154) = 1.74$ ,  $p = .07$ .

### **Patterns of 7-year-old Focal Children's Humour during Sibling Interactions**

Sixty-nine of the 86 7-year-olds (focal children) produced humour ( $M$  humorous instances = 0.54,  $SD = 0.42$ ,  $range = 0.00$  to 2.17) and most often produced word play, sound play, incongruities and banter. In response to their sibling's humour, focal children most often made no response, positive responses, and extended their siblings' humour (Table 5). Seven-year-olds produced a mean of 4.63 conversational turns per minute ( $SD = 1.92$ ), which was significantly associated with their own counts of humour per minute ( $r = .44$ ,  $p < .001$ ). Focal children's instances of humour were also associated with their siblings' instances of humour ( $ICC = .71$ ) indicating interdependency between children's humour production within the dyad. Focal children's propensity to use humour also differed according to play set ( $M = 0.68$ ,  $SD = 0.40$  for the village,  $M = 0.40$ ,  $SD = 0.40$  for the train),  $t(84) = 3.17$ ,  $p = 0.002$ . Therefore, counts of 7-year-olds' own conversational turns, their siblings' instances of humour and play set were controlled in all subsequent analyses.

### **Individual Differences in 7-year-olds' Humour with their Siblings**

Given that we expected males to produce more humour than females, we investigated differences in 7-year-olds' humorous instances according to gender using one-way ANCOVA (additionally controlling sibling gender). Males ( $M = 0.66$ ,  $SD = 0.46$ ) produced more humour instances than females ( $M = 0.41$ ,  $SD = 0.33$ ),  $F(1, 81) = 5.63$ ,  $p = .02$ ,  $\eta_p^2 = .07$ . Gender differences in 7-year-olds' categories of humour within the sibling interaction were investigated

using one-way MANCOVA, and showed a significant main effect, Wilks'  $\lambda = .83$ ,  $F(6, 76) = 2.62$ ,  $p = .02$ ,  $\eta_p^2 = .17$ . Pairwise comparisons indicated that male 7-year-olds performed more incongruities than females ( $p = .002$ ) (see Figure 2). There was no effect of gender on 7-year-olds' responses to their siblings' humour, Wilks'  $\lambda = .95$ ,  $F(5, 77) = 0.83$ ,  $p = .53$ . No differences were found in humour production or responses according to whether the focal child was an older or a younger sibling (all  $ps > .10$ ).

### Discussion

Humour is a central feature of children's social lives (Bergen, 2006), and despite a recent resurgence of interest in the development of humour, children's shared humour with their siblings has received little attention. We asked four overarching questions: (1) what are the patterns of sibling dyads' humour? (2) To what degree do structural features of the sibling relationship affect humour shared within sibling dyads? (3) What is the nature of 7-year-olds' humour? (4) What child-related factors affect 7-year-olds' humour? We address each of these issues and suggest directions for future research in this domain of children's social interactions.

#### Humour in the Sibling Dyad

**Dyadic patterns in humour.** Free play among siblings was a rich context for children's spontaneous humour production. Our exploration of both children's humour production and responses provides a nuanced insight into these dyadic interactions. Humour was common between siblings: on average, sibling dyads produced just under one instance of humour a minute. Over half of the dyadic humorous instances observed were met with either a positive response and/or with a humorous reply. Siblings' shared experiences and knowledge of family life appeared to form a basis for co-constructed, reciprocal humorous exchanges. Many instances of humour were well-rehearsed and ritualistic; for example, siblings often delighted in "co-action

sequences” (Dunn, 1983), performing the same action simultaneously, such as suddenly bursting into the same song. Siblings also reminisced about shared humorous experiences (e.g., as an older sibling pushed a car under a bridge, he said, “Remember that time when, um, that this thing went down on our truck?” Younger sibling laughed and replied, “Yeah, yeah, that was funny!”). These reciprocal exchanges of humour within sibling dyads corroborate claims that humour cannot be understood outside of the framework of social interaction (Airenti, 2016).

**Dyadic humour according to relationship factors.** We investigated differences in sibling dyads’ shared humour as a function of structural features of the relationship. In contrast to expectations, younger and older dyads produced similar counts of humorous instances during free play, in contrast to studies indicating that children produce more humour with age (McGhee, 1979). This difference could be due to our inclusive coding scheme of many different categories of humour observed across development. Certainly, the stability of children’s humour production over time requires further study within participants and longitudinally. In terms of humorous categories, younger compared to older sibling dyads produced more sound play, such as over-exaggerated singing. ‘Silly’ rhyming and over-exaggerated tones of voice are commonly observed with preschool-aged friends and siblings (AUTHORS, 2018). According to Garvey (1977), as soon as children learn a new rule or convention, they have fun distorting and exaggerating it. Therefore, the younger sibling dyads in the present study may have been playing with newly acquired discourse conventions, although this speculation warrants further study.

Same-gender male dyads produced more humorous instances than same-gender female dyads. Male-male dyads performed more incongruities (e.g., putting a see-saw on a house) than both gender compositions, and produced more taboo (e.g., bathroom humour) and clowning (e.g., pulling faces at one another) than same-gender female dyads. This finding supports earlier



reports that male peers produce more humour than females, particularly boisterous, clowning humour (Masten, 1986; McGhee, 1976). While shared humour between brothers may be a marker of warm, friendly, and positive relationships, possibly brothers use humour as a socially acceptable way of expressing hostility or softening criticism and assertive interaction styles (McGhee, 1989; Toplak & Katz, 2000). Indeed, boys are more likely to quarrel with their siblings (Brody et al., 1985), and though mixed-gender siblings engage in more conflict than same-gender siblings (Dunn & Kendrick, 1982; Abramovitch & Corter, 1981), same-gender male dyads may use humour to de-escalate conflict. For example, in one observation of a male dyad, following a protest from the younger sibling, “[OS name] I don’t want...!” The older sibling said, “My idea of a jump, of a taj-a-lump, ooph!” and leapt about the room. Future research should investigate associations between different types of sibling humour and relationship quality, which would reveal much about the role of humour in children’s close relationships.

### **Humour at Age Seven**

**Patterns in 7-year-olds’ humour.** The second stage of our investigation focused on the 7-year-old focal children’s humour. In line with early observations of humour production beyond age four (Bergen, 2002; Garvey, 1977; McGhee, 1979), 7-year-olds most often played with sound (e.g., overexaggerated operatic singing), with words (e.g., producing nonsense words) and performed incongruities (e.g., throwing animals down a slide). Children’s banter was also common, and though predominantly verbal (e.g., “I’m not a goosebump, you are!”), we observed instances of humour that Reddy (2008) categorised as early nonverbal teasing behaviours (e.g., *offer and withdrawal* and *disrupting others’ activities*). For example, a child deliberately took a train track piece from her older sibling’s array and, laughing, held it behind her back. Seven-

year-olds occasionally produced simple, nonverbal, clowning behaviours seen in preverbal infants, such as head waggling and pulling faces (Reddy & Mireault, 2015). Taken together, our observations support assertions that children produce an increasingly wide range of humorous acts in childhood (Airenti, 2016). Possibly, children add to a growing repertoire of both simple and complex humorous acts across development, thus supporting McGhee's (1979) suggestion that early forms of humour continue to be sources amusement later in development.

**Individual differences in humour at seven.** We did not detect birth order differences in children's humour, although due to lack of literature, we had not made a birth order hypothesis. However, we identified that males produced more humour and performed more incongruities than females. This finding corroborates our earlier dyadic gender differences, in addition to both observational and self-report studies of childhood humour that suggest boys' and girls' humour diverges across development (Fox, Hunter, & Jones, 2016; Groch, 1974; McGhee, 1976). We contribute to studies showing that beyond age six, boys demonstrate more sound play (e.g., silly rhyming) and taboo themes (e.g., naughty words or antisocial themes) than girls in their humour (Groch, 1974; McGhee, 1976) and extend these findings to 7-year-olds' spontaneous humour with siblings. Possibly, humour is socialised differently between boys and girls in childhood by parents and teachers (Groch, 1974); future study of these influences may reveal processes by which children develop an individual sense of humour, and possibly, ways in which humour can be promoted to affect wellbeing and their developing ability to understand others.

### **Caveats and Future Directions**

We investigated humour production in relatively closely-spaced sibling dyads; future studies should extend this work by investigating humour within other family configurations, such as widely-spaced sibling dyads, families with more than two children, and socioeconomically

and culturally diverse families. Children's humour was observed in short play sessions, and therefore, some complex humorous acts (e.g., puns, riddling) were rarely observed. This may limit our ability to detect some differences we had expected, such as more complex humour in older children. Although children's production and understanding of complex word play increases with age (Bowes, 1981), children's spontaneous expression of jokes and riddles are more typical after age ten (Howe, 1993). As such, the children in our sample may not yet spontaneously use these complex forms of word play. In other studies with similarly-aged children, complex word play is often tested by specifically asking children to generate jokes or riddles (Bowes, 1981; Yorukoglu, 1974). Our observations and coding of humour within this unconstrained, naturalistic setting may provide a more accurate picture of how siblings share humour in their daily lives.

One supplementary finding was that children's humour differed according to the toys they played with; children given a village set produced more humour than those who played with the train set. This is unsurprising, given that different play materials influence how children play with them (Trawick-Smith, Russell, & Swaminathan, 2010). Perhaps, the structured nature of the train set may restrict the humorous ways children could use the toys, in comparison to the greater possibilities afforded by the thematically more 'open-ended' village set. Although this aligns with earlier studies showing that children are more likely to make object transformations with toys that have similar properties (McLoyd, 1983), the ways children's humour differs according to characteristics of play materials would be an interesting avenue for future research.

We did not identify any group differences in children's responses to humour, although we expected same-sex male dyads would respond more positively to humour. Possibly, our coding of positive responses was not sufficiently sensitive to detect gender differences in humour

responses. For example, when a variety of positive responses are coded, boys are more likely than girls to laugh when engaged in humour, but not to smile (Fabrizi & Pollio, 1987). However, our broad coding of responses indicated interesting nuances in how siblings share humour. For example, we noted a large percentage of siblings' humorous acts were met with no response, raising questions for future study: Does a child's lack of response to an interlocutor's humour indicate ambivalence, or a lack of understanding of their partner's humour? Given siblings' rapport, mutual interests, and co-constructed history (AUTHORS, 2011), the former possibility seems unlikely. Instead, humour production and the cognitive skills required to understand humour may not necessarily develop simultaneously (Airenti, 2016). Indeed, observations of young children show that, while they may attempt to share humorous word play (e.g., jokes, puns) with others, their delivery of incorrect punchlines indicates a lack of understanding of the verbal content (Dubois, Farmer, & Farmer, 1984). More systematic study of the relationship between humour production and humour understanding during children's interactions is warranted.

### **Conclusions**

Our findings draw attention to humour as an important feature of children's interactions with their siblings. The present study contributes to knowledge about the dyadic nature of children's humour, the types of humour children produce, and factors that influence children's humour production within their sibling relationships. Given that humour is likely to be associated with numerous positive outcomes, there is still much to be learned about this feature of childhood social interactions. Not only do children delight in humour, but it may reveal a great deal about how they navigate their social worlds.

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Table 1

*Coding scheme for categories of children's humour production with examples*


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Humour production
<p><b>1. Performing incongruities</b>            Describing and/or enacting a conflict between what is normal/expected and reality. For example, a wrong object location or a wrong object action.            e.g., YS: (pushing animals down a slide) "Animals on the slide!"            e.g., OS: "I'll let you in on a little secret. I have cheese in my pocket."</p>
<p><b>2. Word Play</b>            Nonsense words or phrases. Riddling. Made-up stories with humorous themes (e.g., impossible or slapstick). Label-based humour, calling something the wrong name. Making deliberate mistakes or changing words in well-known songs.            e.g., YS: "A, B, C, D, E, F, R!"            e.g., OS: "Mark, whaddya call a test tube with a college degree? A graduated cylinder. Duuum!"</p>
<p><b>3. Sound Play</b>            Humorous singing and chanting, for example sudden bursting into a loud opera-type song. Over exaggerated vocalisations or speech, exaggerated gasps, animal noises, using a very deep or gruff voice in a silly or unconventional way.            e.g., OS: (shouting in high-pitched voice) "Eww! I've been slimed!"            e.g., YS: (chanting) "Itchy, itchy, itch in my back."</p>
<p><b>4. Taboo</b>            Disgusting noises, such as blowing raspberries, fart noises, burp noises. Using taboo words or discussion and/or enacting taboo themes.            e.g., OS: "Fart? Does it fart?"            e.g., YS: "H-I-J-K-L-M-N-O-PEE! Get it? Pee!"</p>
<p><b>5. Banter</b>            Humorous aggression, derision, teasing or mocking imitation. Include light-hearted insults. Rough and tumble play.            e.g., OS: "Ya dummy."            e.g., YS: "Dork." OS replies, "Thank you. I'm so proud of being one."</p>
<p><b>6. Clowning</b>            Silly or over exaggerated body movements, dancing, posing or face contortions.            e.g., YS shakes hips and twirls his index finger of one hand.            e.g., OS curls into a ball on his back and holds the position for 10 sec.</p>

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*Note.* OS = Older sibling; YS = Younger sibling. Multiple categories of humour could occur within a single humorous instance.

Table 2

*Coding scheme and examples of children's responses to humour*


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Responses to humour production
<p><b>1. No response</b> Humour is followed by no response or reaction. Includes passive watching, ignoring by not looking, walking away, or by providing an off-topic or irrelevant response. e.g., YS: "Tree in the pool! Tree in the pool!" OS remains silent. e.g., OS: "It's upside down, you dip." YS: (off-topic) "I know something, Chris, I know something."</p>
<p><b>2. Positive/neutral response</b> Any verbal or non-verbal behaviour that reinforces humour production, including positive affect (smiling, laughing), praising or commending humour. Any verbalisation or behaviour that serves to continue the humour is also coded. e.g., OS: "They care a lot to be mushed choco." YS: (laughing) "Chris, you make me laugh." e.g., OS: "Trees." YS "Cheese!" OS: "Trees!"</p>
<p><b>3. Negative response</b> Any verbal or nonverbal behaviour that protests humour production. Includes negative or reprimanding statements, or actions that show disapproval. e.g., YS: (throwing pigs down the slide with an over exaggerated loud voice) "Wahoo! Wahoo!" OS: "I'm trying to concentrate!" e.g., YS: (singing and wagging head) "Uh-huh, uh-huh, uh-huh!" OS: "Shhh!"</p>
<p><b>4. Clarification</b> Humour production is followed by a questioning response. e.g., OS: "My idea of a jump, of a taj-da-lump [leaps through the air]." YS: "What?" e.g., YS: makes silly face contortion at OS. OS: "Huh?"</p>
<p><b>5. Imitation</b> Intentional exact repetition of the humorous act. e.g., YS (overexaggerated silly voice): "What's so funny?" OS (same tone): "What's so funny?" e.g., OS: "Shick sha ba boobley." YS: "Shick sha-ba!" OS: "You can't say it!" YS: "Shick sha ba boobley!"</p>
<p><b>6. Extension</b> Humour is followed by another humorous response, which may be a modification of their partner's previous humour or introduction of a new category of humour. e.g., YS: "henny penny henny henny penny henny." OS: "henny penny henny penny penny henny henny penny henny..." (Both chanting) e.g., YS: "Oh yes he is!" OS: "Oh no he isn't!"</p>

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*Note.* OS = Older sibling; YS = Younger sibling. Child names are changed. Where children responded to humour, types of responses could co-occur.

Table 3

*Coded example of humour categories and responses within a sibling interaction.*

Humour instance	Child	Behaviour	Humour category	Response to previous humour instance
1	YS	His butt is cut off. You know your butt is a round shape?	Taboo	
2	OS	Wait... ( <i>makes fart noise</i> )	Taboo	Extension
3	YS	Chris! I said butt!	Taboo	Extension
4	OS	Hee hee! ( <i>chanting</i> ) Butt, butt, butt, butt, butt, butt, butt, butt.	Taboo + sound play	Positive + extension
5	YS	( <i>Joins in with OS</i> ) Butt, butt, butt, butt.	Taboo + sound play	Imitation
6	OS	( <i>Singing</i> ) A-B-C-D-E-F-G	Sound play	Extension
7	YS	( <i>Joins in singing</i> ) E-F... ( <i>with emphasis</i> ) R!	Sound play + word play	Extension
8	OS	H-I-J-K-L-M-N-O... ( <i>with emphasis</i> ) PEE! Get it? Pee!	Sound play + word play + taboo	Extension
9	YS	Pee-pee!	Taboo	Extension
10	OS	Pee-pee!	Taboo	Imitation

*Note.* OS = Older sibling; YS = Younger sibling. Child names are changed. In this example, the older sibling is the focal child.

Table 4

*Descriptive statistics for humour categories and responses to humour within sibling dyads.*

	Sibling dyad			
	N dyads with a count (%)	Proportion of humorous instances (%) <sup>*</sup>	Mean (SD)	Range
Types of humour				
Word play	54 (62.8)	21.1	0.31 (0.30)	0.00 to 1.19
Sound play	55 (64.0)	34.1	0.38 (0.39)	0.00 to 2.09
Performing incongruities	47 (54.7)	17.4	0.25 (0.29)	0.00 to 1.43
Taboo	41 (47.7)	17.1	0.24 (0.31)	0.00 to 1.38
Clowning	24 (27.9)	6.7	0.12 (0.21)	0.00 to 1.00
Banter	40 (46.5)	18.8	0.25 (0.33)	0.00 to 1.40
Types of response				
No response	74 (86.0)	41.1	0.51 (0.33)	0.00 to 1.47
Positive/neutral	51 (59.3)	25.2	0.32 (0.35)	0.00 to 1.81
Negative	35 (40.7)	7.5	0.16 (0.20)	0.00 to 0.64
Imitation	23 (26.7)	4.7	0.10 (0.18)	0.00 to 0.65
Extension	46 (53.4)	23.3	0.31 (0.34)	0.00 to 1.32
Clarification <sup>^</sup>	16 (18.6)	2.2	0.02 (0.05)	0.00 to 0.21

Note.  $N = 86$  sibling dyads.

\*Humour categories and responses to humour could co-occur, therefore percentages do not equal 100%.

Means, standard deviations and ranges are based on counts of humour/response per minute and are square root transformed.

<sup>^</sup>Clarification was dropped from further analysis due to low counts, therefore descriptives are based on raw scores.

Table 5

*Descriptive statistics for 7-year-old focal children's humour production and responses to humour when interacting with their sibling.*

7-year-old focal child in sibling session			
	N children with a count (%)	Mean (SD)	Range
Types of humour			
Word play	38 (44.2)	0.20 (0.24)	0.00 to 0.78
Sound play	42 (48.8)	0.24 (0.25)	0.00 to 1.69
Performing incongruities	37 (43.0)	0.17 (0.24)	0.00 to 1.40
Taboo	31 (36.0)	0.16 (0.24)	0.00 to 0.99
Clowning	15 (17.4)	0.07 (0.17)	0.00 to 0.73
Banter	33 (38.4)	0.17 (0.25)	0.00 to 1.15
Types of response			
No response	65 (75.6)	0.34 (0.26)	0.00 to 1.29
Positive/neutral	36 (41.9)	0.18 (0.25)	0.00 to 1.05
Negative	18 (20.9)	0.07 (0.15)	0.00 to 0.60
Imitation	15 (17.4)	0.06 (0.14)	0.00 to 0.55
Extension	36 (41.9)	0.19 (0.24)	0.00 to 0.89
Clarification	9 (10.5)	0.01 (0.03)	0.00 to 0.21

*Note.*  $N = 86$  focal children.

\*Humour categories and responses to humour could co-occur, therefore percentages do not equal 100%.

Means, standard deviations and ranges are based on counts of humour/response per minute and are square root transformed.

^Clarification was dropped from further analysis due to low counts, therefore descriptives are based on raw scores.

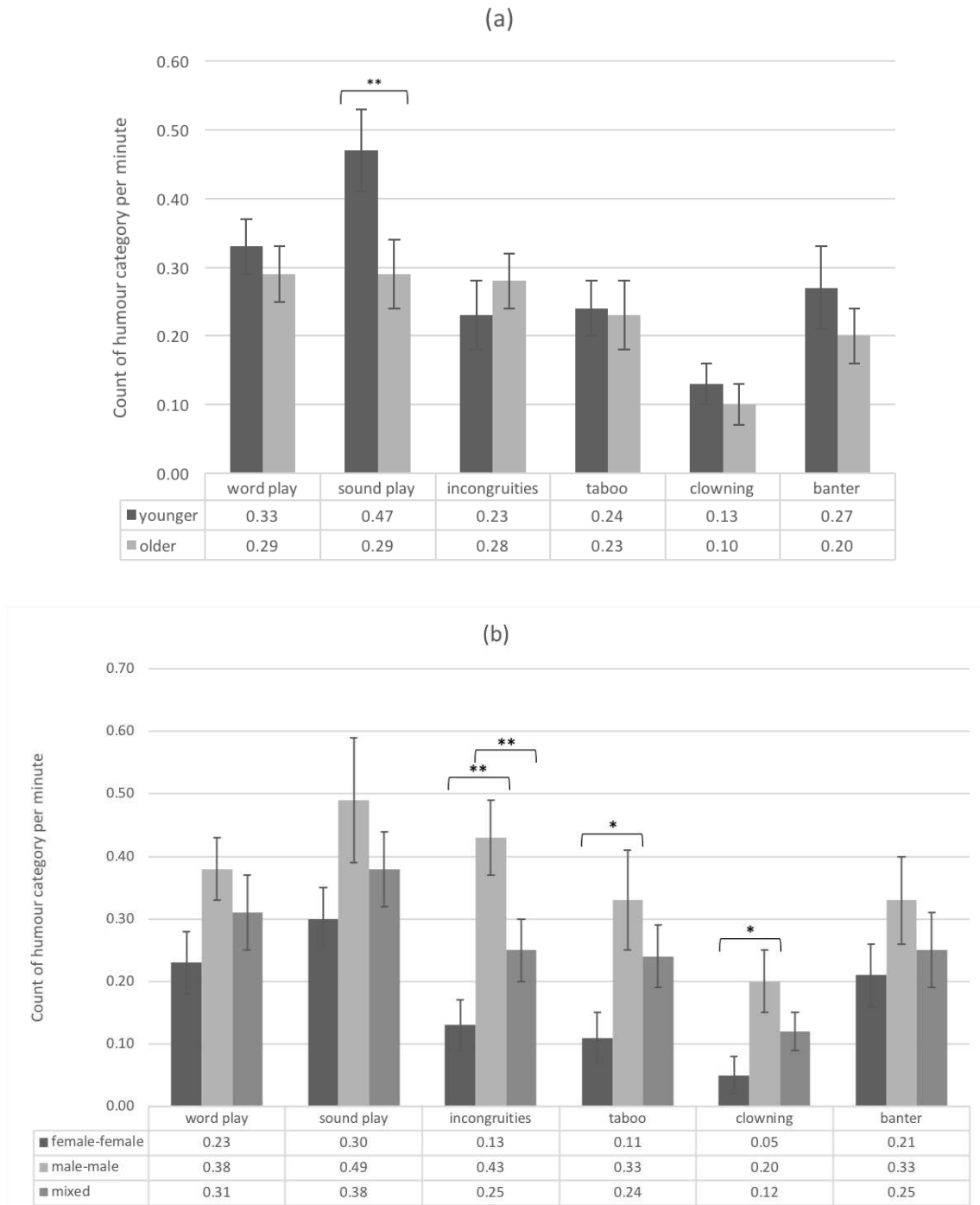


Figure 1. Differences in humour categories used by younger and older sibling dyads (a) and female-female, male-male, and mixed gender sibling dyads (b). Error bars represent the standard error of the mean. \* $p < .05$ , \*\* $p < .01$ .



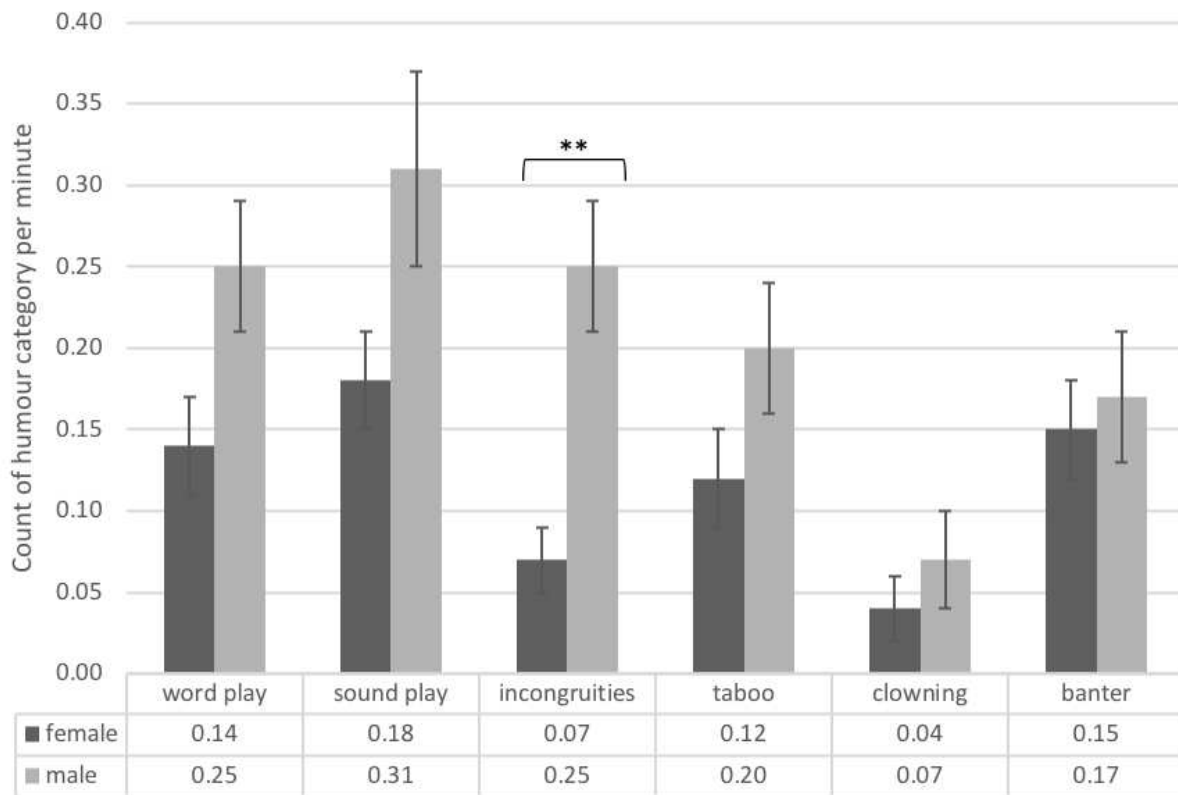


Figure 2. Differences in humour categories used by male and female seven-year-olds. Error bars represent the standard error of the mean.  $**p < .01$ .