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Individual differences in children's private speech: The role of imaginary companions



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ABSTRACT

Relations between children's imaginary companion status and their engagement in private speech during free play were investigated in a socially diverse sample of 5-year-olds ($N = 148$). Controlling for socioeconomic status, receptive verbal ability, total number of utterances, and duration of observation, there was a main effect of imaginary companion status on type of private speech. Children who had imaginary companions were more likely to engage in covert private speech compared with their peers who did not have imaginary companions. These results suggest that the private speech of children with imaginary companions is more internalized than that of their peers who do not have imaginary companions and that social engagement with imaginary beings may fulfill a similar role to social engagement with real-life partners in the developmental progression of private speech.

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Introduction

Modern research on the developmental progression of children's private speech (e.g., [Berk & Garvin, 1984](#); [Diaz & Berk, 1992](#); [Winsler & Naglieri, 2003](#)) supports [Vygotsky's \(1934/1987\)](#) contention that this form of self-talk is gradually internalized during early childhood and transformed into inner speech or verbalized thought. Indeed, the degree of internalization of private speech has been formalized into a three-level coding scheme ([Berk, 1986](#)), from task-irrelevant speech (Level 1) through self-guiding, task-relevant comments (Level 2) to covert whispering and verbal lip

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movements (Level 3). The incidence of overt private speech peaks between 3 and 7 years of age (Berk, 1992; Kohlberg, Yaeger, & Hjertholm, 1968), a time when children frequently talk out loud to themselves while engaged in a range of activities. As children get older, their private speech becomes increasingly more difficult to understand because it is both quieter (whispering and muttering) and more abbreviated and condensed (occasional words rather than complete sentences). Kohlberg and colleagues (1968) reported that children continue to use this covert private speech well into middle childhood, and more recent research has shown that private speech endures as a means of regulating cognitive performance even during adulthood (Duncan & Cheyne, 1999, 2002).

Children's use of private speech has been shown to be positively associated with their performance on a range of cognitive tasks, including planning (Fernyhough & Fradley, 2005) and puzzle solving (Winsler, Diaz, McCarthy, Atencio, & Adams Chabay, 1999). More striking evidence for the role of private speech in children's concurrent cognitive performance comes from the finding that preventing children from engaging in its use (via articulatory suppression) during the planning phase of an executive function task results in impaired performance (Lidstone, Meins, & Fernyhough, 2010). In addition to its facilitation of concurrent cognitive performance, children's tendency to engage in private speech during executive planning tasks is also positively associated with their engagement in phonological recoding strategies during a working memory task (Al-Namlah, Fernyhough, & Meins, 2006) and with the richness with which they recall autobiographical memories (Al-Namlah, Meins, & Fernyhough, 2012). Moreover, children's use of private speech shows consistency across different tasks and contexts (Lidstone, Meins, & Fernyhough, 2011; Winsler, De León, Wallace, Carlton, & Willson-Quayle, 2003), suggesting that internalization of private speech may represent a domain-general shift in children's ability verbally to mediate their behavior (Fernyhough, 2008).

Private speech appears to be a universal feature of childhood. For example, there is evidence that developmental disorders such as attention deficit/hyperactivity disorder (ADHD; Berk & Landau, 1993; Berk & Potts, 1991; Winsler, Manfra, & Diaz, 2007) and even specific language impairment (Lidstone, Meins, & Fernyhough, 2012) merely delay the internalization of private speech rather than prevent children from using such speech to regulate their behavior. But despite this evidence for the universality of private speech, there are individual differences in its use at any given age. Such differences highlight the potential impact of children's social environment on the development of private speech. For example, more advanced private speech has been found to be associated with an authoritative parenting style (Behrend & Rosengren, 1992; Winsler, Feder, Way, & Manfra, 2006) and higher socioeconomic status (Berk & Garvin, 1984). Conversely, delays in private speech development have been reported in children whose early social experiences have been restricted. Children brought up in low-income Appalachian families, a culture where adult-child verbal communication is limited, show delays in private speech (Berk & Garvin, 1984), as do children from low-income families with a history of abuse (Diaz, Neal, & Vachio, 1991). Consistent with Vygotsky's (1934/1987) contention that private speech has its origins in early social dialogue, these individual differences in private speech have been interpreted with reference to the differing levels of engagement in adult-child social exchange afforded by these wide-ranging family contexts.

In contrast to this broad literature on social-environmental influences on private speech, little attention has been given to the potential role of child-centered social engagement characteristics. The current study is the first to investigate whether children's imaginary social interaction fulfills a similar role to social engagement with real-life partners in the developmental progression of private speech. Specifically, we focused on whether children's creation of imaginary companions is related to the sophistication and content of their private speech. Svendsen (1934) defined an imaginary companion as "an invisible character named and referred to in conversation with other persons or played with directly for a period of time, at least several months, having an air of reality for the child, but no apparent objective basis" (p. 988). This definition has endured, but modern research has also included imaginary beings that are embodied in a toy or an object (so-called personified objects) within the category of imaginary companions. Prevalence rates of having an imaginary companion at some point during childhood range from 10% (Bouldin & Pratt, 1999) to 65% (Taylor, Carlson, Maring, Gerow, & Charley, 2004), with typical rates around 20% to 50% (Fernyhough, Bland, Meins, & Coltheart, 2007; Gleason, 2005; Gleason & Hohmann, 2006).

Children will often speak and respond to their imaginary companions as they would to real people (Taylor, 1999) and report that imaginary companions and real-life friends fulfill similar social roles (Gleason, 2002). Gleason and Hohmann (2006) investigated children's views about their relationships with their imaginary companions and with real children with whom the friendships were either reciprocated or nonreciprocated. Gleason and Hohmann reported that there were no perceived differences between imaginary companions and reciprocated real friends with respect either to children's tendency to want to play with the individuals and tell the individuals a secret or to the individuals' tendency to like the children more than other children and to think that the children were good at a lot of things. In contrast, children scored their imaginary companions more highly across these different dimensions than they did real children with whom they had nonreciprocated friendships. These findings highlight the high level of intimacy and social communication in children's relationships with their imaginary companions. If social dialogue with an imaginary companion can be considered to fulfill a similar role to that with a real-life caregiver or peer, having an imaginary companion would be expected to be positively associated with private speech development. Moreover, the fact that research suggests that children do not invent imaginary companions to compensate for their lack of real friends (e.g., Gleason, 2004; Gleason, Sebanc, & Hartup, 2000) indicates that social exchange with imaginary companions will be in addition to typical levels of interaction with peers. Exploring the relation between children's imaginary companion status and their private speech may thus provide an interesting test of Vygotsky's (1934/1987) proposal that social experience plays an important role in private speech development.

How might any such imaginary companion-related differences in children's private speech best be characterized? Having an imaginary companion and the greater opportunities for dialogic self-talk that an imaginary companion affords might facilitate the internalization of private speech, leading to the prediction that the private speech of children who have imaginary companions will be more developmentally advanced than that of their peers who do not. Specifically, the private speech of children who have imaginary companions would be predicted to be more covert (indicating partial internalization). In addition, imaginary companion status may relate to the content of children's private speech. For example, engaging in dialogue with and about their imaginary companions may relate to a tendency to include more conversational exchange and fantasy themes within their private speech. Harris (2000) argued that engaging with an imaginary companion is a very rich form of role-play and thus requires the child to take on the persona of the imaginary companion and to take the companion's perspective into account. In line with this suggestion, children who have imaginary companions have been found to be better able than their peers who do not have imaginary companions to understand a listener's or observer's perspective in the context of (a) conveying specific information (Roby & Kidd, 2008), (b) storytelling and autobiographical recall (Trionfi & Reese, 2009), and (c) attributing knowledge about unobservable aspects of themselves relating to dreaming and hunger (Davis, Meins, & Fernyhough, 2011). Their grasp of other people's perspectives may thus facilitate the use of imaginary dialogue and fantasy in the private speech of children who have imaginary companions.

The possibility that imaginary companion-related differences may relate both to the degree of internalization and to the content of private speech raises the issue of observational context. Private speech has typically been elicited and examined in two main ways. First, it is common for experimenters to use cognitive tasks to elicit private speech in the classroom or developmental laboratory (e.g., Berk & Landau, 1993; Fernyhough & Fradley, 2005; Lidstone et al., 2010, 2011; Winsler et al., 2003). Observing private speech during challenging cognitive tasks is ideal for investigating children's use of task-related private speech and the extent to which such speech relates to task success, but it is less well suited to exploring narrative and fantasy in private speech. Other studies have assessed private speech in more open-ended contexts such as free play (Fernyhough & Russell, 1997; Kraft & Berk, 1998; Olszewski & Fuson, 1982). Unlike private speech observed during specified cognitive tasks, the private speech that children use during play sheds light on the topics and themes that they themselves choose to talk about, thereby providing insight into how children use this speech to structure self-determined tasks (Kraft & Berk, 1998). Private speech may differ in play situations, not just according to what goals children set for themselves, but also with respect to the materials available to serve as physical outlets for their imagination (Olszewski & Fuson, 1982). For this reason, the

content as well as the function of private speech may differ when children move between problem-solving and play contexts. Moreover, parents reported that their children engaged in more private speech during fantasy play than during problem-solving activities (Winsler et al., 2006), suggesting that play contexts may optimize children's tendency to engage in private speech. Consequently, we chose to observe private speech during free play in order to explore how children's imaginary companion status related to the content of their private speech as well as its level of internalization.

In summary, the aim of the study reported here was to investigate how a child's creation of an imaginary companion is related to (a) the degree of internalization and (b) the content of the child's private speech during free play. Given the reported relations between socioeconomic status (SES) and private speech (Berk & Garvin, 1984; Diaz et al., 1991), the current study involved a socially diverse sample of children and investigated whether any relation between imaginary companion status and private speech was independent of children's SES.

Method

Participants

Participants were 148 61-month-olds (73 girls, 75 boys, mean age = 61.3 months, range = 59–64) from socially diverse backgrounds. SES was assessed using the Hollingshead index (Hollingshead, 1975); scores ranged from 14 to 66 ($M = 35.73$, $SD = 14.04$), with 59 children being classed as low SES (parents educated only to minimum school-leaving age and unemployed or in menial/manual employment). The children had been participating with their mothers in a longitudinal study begun during the first year of life (see Meins, Fernyhough, Arnott, Turner, & Leekam, 2011; Meins et al., 2012). Parents gave full informed consent at each testing phase.

Materials and methods

Children's private speech was assessed from a free play session that was conducted in the university's developmental laboratory. The private speech assessment formed part of a 90-min testing session involving the child and mother. The imaginary companion interview was conducted approximately 1 week later in a quiet area in the child's school as part of a separate testing session that lasted approximately 30 min.

Speech coding

The free play session followed immediately after the mother and child had participated in a joint pretense task involving visiting an ice cream parlor. The experimenter gave the mother a booklet of questionnaires to complete and directed her to sit on a chair in the corner of the testing room. The experimenter then told the child that he or she could continue playing, and the toys and props from the joint pretense task were available. The experimenter stayed in the room and responded to the child if he or she asked questions or attempted to involve the experimenter in play, but otherwise she refrained from talking to or playing with the child. The play session lasted until the mother had completed the questionnaire, with the average session lasting 5 min (range = 2–14). Children were filmed throughout the session by two remote-controlled cameras mounted on opposite walls of the testing room. The cameras provided a clear view of the child's face throughout the session.

Children's speech during the session was later transcribed verbatim and coded for private speech. Children's speech was first divided into discrete utterances. An utterance was defined as a unit of speech containing no temporal or semantic discontinuities. A temporal discontinuity was defined as a pause of at least 2 s, whereas a semantic discontinuity was defined as a change in content regardless of whether it was preceded by a pause. Each utterance was first coded as social or private using criteria outlined by Winsler, Fernyhough, McClaren, and Way (2004).

Social speech. These are utterances addressed to a social partner (the mother or experimenter) as indicated by the following markers: (a) *eye contact*, where the child shows sustained eye contact with the

mother or experimenter during exchange; (b) *behavioral*, where the child's behavior involves the experimenter or mother through gaze direction or physical contact or where the mother's or experimenter's behavior involves the child within 2 s of the utterance; (c) *content markers*, where the child's utterance has the same topic as the mother's or experimenter's preceding utterance or where the child addresses the mother or experimenter by name; and (d) *temporal contiguity*, where the child's utterance occurs less than 2 s after any other social utterance.

Private speech. These were utterances that did not meet the above criteria for social speech. Each private speech utterance was further coded using a scheme adapted from Winsler and colleagues' (2003) criteria. Each private speech utterance was placed into 1 of 11 mutually exclusive and exhaustive categories: (a) *exclamations*—typically one-word expletives or expressions of affect (e.g., “Oh!” “Oops!” “Ha!” “Woah!”); (b) *nonwords*—sound effects, wordplay, humming (e.g., “Dum di dum,” “Vroom,” explosion noises); (c) *descriptions of the self*—statements about the child's state or behavior (e.g., “I found a fish,” “I'm hungry,” “I want the strawberry,” “I like this!”); (d) *descriptions of the environment/task*—statements about the child's surroundings or the task (e.g., “They're the same color,” “It's hot in here,” counting items); (e) *evaluative or motivational statements*—statements about the child's ability, performance, or motivation, self-reinforcement or deprecation, evaluation of the task (e.g., “I did it,” “I'm good at this,” “Silly me,” “This is easy”); (f) *plans/hypothetical reasoning*—planning or future-oriented statements, if–then constructions (e.g., “I need a purple one,” “I'll do this first,” “If I put this here”); (g) *commands to the self*—explicit instructions to the self with imperative verb constructions (e.g., “Pick them up,” “Don't put that one,” “Get one more”); (h) *questions/answers*—questions addressed to the self or clear answers to one's own questions (e.g., “Which one should I put next?” “Where's the blue?” “Is that right?”); (i) *transitional statements*—reflective utterances that had to do with ending one activity and starting another (e.g., “So,” “Then,” “Next,” “Okay,” “There”); (j) *fantasy-related/dialogue*—any statements with a fantasy theme (e.g., “Yum, yum,” “I'm going to be rich, this is going to be great!” “Teddy wants an ice cream,” “We're opening the shop”) or any dialogue in which the child addressed the stuffed animals or other toys or spoke on behalf of the animals or toys (e.g., “What do you want teddy?” “I'd like strawberry please”) or spoke in a different voice; and (k) *covert private speech*—muttering, whispering, verbal lip movements, and unintelligible speech (covert private speech was not coded for content given that it was impossible to discern what the child was saying).

Private speech in categories (c) to (i) is equivalent to Berk's (1986) Level 2 task-relevant overt private speech. The covert private speech category maps directly onto Berk's (1986) Level 3 private speech (the most sophisticated, internalized form of private speech). Children received a frequency score for the number of private speech utterances falling into each of the 11 categories. Private speech content was coded by a researcher blind to imaginary companion status, with a randomly selected 20% of sessions being coded by a second blind researcher. Interrater agreement was $\kappa = .92$.

Imaginary companion interview

Children's imaginary companion status was assessed using the imaginary companion interview developed by Taylor and Carlson (1997). The experimenter began, “Now I am going to ask you some questions about friends. Some friends are real, like the kids who live on your street, the ones you play with. And some friends are pretend friends. Pretend friends are ones that are make-believe that you pretend are real. Do you understand?” When the child indicated that he or she understood, the experimenter went on to ask whether the child had a pretend friend. If the child indicated the existence of an imaginary companion, the child was asked (a) the name of the imaginary companion, (b) whether people other than the child could see the imaginary companion, (c) whether the child could see the imaginary companion, (d) the gender, age, and physical appearance of the imaginary friend, (e) what the child liked and disliked about the imaginary friend, and (f) where the imaginary friend lived and slept. Children's imaginary companions could be entirely invisible or personified objects. Examples of children's imaginary companions are shown in Table 1.

Mothers completed a questionnaire similar to the child imaginary companion interview in order to provide parental corroboration of their children's imaginary companions. Mothers were also asked to indicate how long the imaginary companions had existed. Children were credited with having

Table 1

Examples of imaginary companions.

1	Mr. Nobody: an invisible boy with brown, curly hair down to his waist who never sleeps and watches TV all through the night
2	Yellow Granny: an invisible girl with dyed, gingery hair tied up in a ponytail who lives in a flat at the top of the Tower of London
3	Mo: an invisible, mischievous boy who lives in the child's bathroom
4	A nameless, tiny, invisible squirrel who lives on the child's back during the day
5	Casey: an invisible girl with green eyes and long blonde hair whose favorite color is pink; she wears a shirt with love hearts on it and sleeps in a hotel every night
6	Bear: a personified object (a teddy bear) who is old and wise and always knows everything
7	Teddy: a personified object (an elephant) who likes to hide away but can fly with his ears
8	Fin: a personified object (a hound dog) who has very pointy ears and can run really fast
9	Fudge: a personified object (a rabbit) who has long, white and gray ears and a plaster on his foot, and who likes to go into the child's room and move things around
10	Buttons: a personified object (a dog) who is white with black spots and has a magic collar that can change color

imaginary companions if (a) they were corroborated by their mothers or (b) children provided convincing, fleshed-out descriptions of the imaginary companions. For the corroborated imaginary companions, mothers reported that the imaginary companions had existed for between 2 and 48 months, with the average duration of existence being 25.19 months ($SD = 12.65$). Mothers who reported that the imaginary companions had been present since infancy explained that the companions had existed ever since their children could speak. These very early imaginary companions were all personified objects. For all of the noncorroborated imaginary companions, children explained that the imaginary companions were visible only to them, often saying that no one else knew about the imaginary companions or that their existence was secret. The veracity of imaginary companions that were not corroborated by the mothers was assessed by two independent raters; perfect agreement was achieved.

Receptive language ability

Children's receptive verbal ability was assessed using the British Picture Vocabulary Scale (BPVS; Dunn, Dunn, Whetton, & Burley, 1997) to control for verbal ability given its previously observed positive association with having an imaginary companion (Taylor & Carlson, 1997) and with private speech (Al-Namlah et al., 2006). Verbal ability data were available for 140 children. The mean standardized score was 103.64 ($SD = 14.71$, range = 43–166).

Results

Descriptive statistics and preliminary analyses

Of the 148 children, 68 (46%) stated that they had imaginary companions, 34 (50%) of which were corroborated by their mothers. The pattern of findings was identical when using the total or maternally corroborated imaginary companion groups. Consequently, only results using the total imaginary companion group are reported below. Of the 68 imaginary companions, 47 (69%) were entirely invisible. Children with invisible versus personified object imaginary companions did not differ on any of the private speech measures ($ts < 1.26$, $ds < 0.45$); thus, these two categories were collapsed in the analyses. Imaginary companion status was unrelated to children's BPVS scores, $t(138) = 0.25$, $p = .807$.

A total of 18 children (9 girls and 9 boys), 2 of whom were in the imaginary companion group, failed to use any private speech during their observations. As shown in Table 2, several of the subtypes of private speech occurred at low frequencies. Thus, categories assessing similar aspects of private speech were amalgamated as follows: Exclamations and nonwords were summed, and descriptions of self, evaluative/motivational statements, plans/hypothetical reasoning, commands to self, questions/answers, descriptions of the environment/task, and transitional statements were summed to form a *play-focused overt private speech* category, which can be regarded as equivalent to Berk's (1986) Level 2 (task-relevant, overt) private speech. The frequency scores for the fantasy-related/

Table 2
Descriptive statistics for private speech variables.

	Range	Mean (SD)
Total utterances	0–86	11.48 (13.72)
Exclamations	0–10	0.77 (1.43)
Nonwords	0–37	1.99 (3.99)
Descriptions of the self	0–6	0.58 (1.20)
Descriptions of the environment/task	0–12	1.48 (2.37)
Evaluative/motivational statements	0–6	0.41 (1.02)
Plans/hypothetical reasoning	0–16	0.76 (1.78)
Commands to the self	0–8	0.54 (1.26)
Questions/answers	0–4	0.33 (0.72)
Transitional statements	0–5	0.43 (0.94)
Fantasy-related/dialogue	0–44	2.32 (5.00)
Covert private speech	0–24	1.81 (3.46)

dialogue and covert private speech categories were relatively higher, and both of these categories indexed stand-alone aspects of private speech; thus, these categories remained unchanged.

The private speech measures were all non-normally distributed. The *F* test is robust against violations of the assumption of normality as long as there are at least 20 degrees of freedom for error (Tabachnick & Fidell, 2007), so data were not transformed. However, we identified outliers for some of the private speech measures using Hoaglin and Iglewicz's (1987) procedure and took the conservative approach of also running the analyses with outliers excluded. For exclamations/nonwords, there was 1 outlier (from the imaginary companion group); for play-focused private speech, there were no outliers; for fantasy-related/dialogue, there were 3 outliers (2 from the imaginary companion group); and for covert private speech, there were 6 outliers (5 from the imaginary companion group).

The length of time the play session took was positively correlated with children's play-focused private speech, $\rho(146) = 0.21$, $p = .011$, but was unrelated to the other private speech measures ($\rho s < .15$).

For the children whose imaginary companions had maternal corroboration, there was no relation between maternal reports on how long the imaginary companions had existed and any of the private speech measures ($\rho s < .15$).

Child gender was unrelated to imaginary companion status and to the private speech measures, and it was not considered further in the analyses.

Imaginary companion status and private speech

Table 3 shows the mean scores for the private speech categories as a function of imaginary companion status. The relation between imaginary companion status and children's private speech was investigated using a multivariate analysis of covariance (MANCOVA) with imaginary companion status (imaginary companion or no imaginary companion) entered as a fixed variable and the frequency scores for the four private speech categories (exclamations/nonwords, play-focused, fantasy-related/dialogue, or covert) entered as the dependent variables. SES, BPVS scores, children's total number of utterances during the session, and overall duration of the play session were added as covariates. There was a main effect of imaginary companion status, $F(1, 133) = 3.16$, $p = .016$, $\eta^2 = .089$.

With regard to the separate categories of private speech, compared with their peers who did not have imaginary companions, children in the imaginary companion group engaged in more covert private speech, $F(1, 133) = 11.32$, $p = .001$, $\eta^2 = .085$. There was a trend for children in the imaginary companion group to engage in more fantasy-related/dialogue private speech than their peers who did not have imaginary companions, $F(1, 133) = 3.63$, $p = .059$, $\eta^2 = .027$. Imaginary companion status was not related to exclamations/nonwords, $F(1, 133) = 0.04$, $p = .849$, $\eta^2 = .000$, or play-focused overt private speech, $F(1, 133) = 2.02$, $p = .157$, $\eta^2 = .015$.

The MANCOVA was rerun as above but with the outliers excluded for the relevant private speech categories. With outliers removed, there was a main effect of imaginary companion status, $F(1, 125) = 5.26$, $p = .001$, $\eta^2 = .147$. With regard to the separate categories of private speech, compared

Table 3

Means (and standard deviations) for private speech categories as a function of imaginary companion status.

	IC (<i>n</i> = 68)	NIC (<i>n</i> = 80)
Exclamations/nonwords	3.28 (5.42)	2.39 (3.72)
Exclamations/nonwords (excluding outliers)	2.77 (3.51)	2.39 (3.72)
Play-focused overt private speech	4.89 (6.12)	4.31 (6.19)
Fantasy-related/dialogue	2.60 (6.77)	2.22 (3.48)
Fantasy-related/dialogue (excluding outliers)	1.46 (2.44)	2.05 (3.11)
Covert private speech	3.02 (4.82)	1.00 (1.62)
Covert private speech (excluding outliers)	1.94 (2.45)	0.84 (1.15)

with their peers who did not have imaginary companions, children in the imaginary companion group engaged in more covert private speech, $F(1, 125) = 12.80$, $p = .000$, $\eta^2 = .102$, and less fantasy-related/dialogue private speech, $F(1, 123) = 6.93$, $p = .010$, $\eta^2 = .055$.

Discussion

The aim of the study reported here was to assess the extent to which the content and level of internalization of children's private speech during free play related to their imaginary companion status. Controlling for SES, children's receptive verbal ability and total number of utterances, and the duration of the play session, there was a main effect of imaginary companion status on private speech. Specifically, imaginary companion group children were more likely than their peers who did not have imaginary companions to engage in covert private speech (equivalent to Berk's Level 3 category). This effect of imaginary companion status on children's use of covert private speech was maintained when outliers (who were predominantly from the imaginary companion group) were removed.

In the Introduction, we considered whether having an imaginary companion would be positively related to the level of internalization of children's private speech or to the extent to which private speech involved fantasy and dialogue. The results of the current study suggest that having an imaginary companion is associated with greater internalization of private speech. The analysis including all children also indicated a trend for children with imaginary companions to engage in more fantasy-related/dialogue private speech than their counterparts who did not have imaginary companions. However, the direction of this effect was reversed when outliers were removed. These contrary findings are worthy of further discussion. Given that it was not possible to discern the content of children's covert private speech and the fact that this partially internalized form of speech was most common in the imaginary companion group children, it is somewhat difficult to make strong conclusions about how the content of private speech varies as a function of imaginary companion status. It is likely that at least some of the content of covert speech will involve fantasy or dialogue, and so the difference between the two groups on this category of speech may be more apparent than real. Anecdotally, several examples of covert private speech in children with imaginary companions were clearly dialogic in nature, and one child was observed to have a one-way covert "conversation," complete with facial expressions and hand gestures, with an imaginary being. Thus, until measures on the content of covert speech can be obtained, it is not possible to establish the true relation between imaginary companion status and the fantasy content of children's spontaneous private speech. Future research could attempt to assess covert speech content by having children wear sensitive microphones to record their whispering and muttering; alternatively, children could hear the recording of themselves and be asked to explain what they were saying.

In further exploring the relation between having an imaginary companion and the content of children's private speech, it would be interesting to investigate whether the themes of children's actual interactions with their imaginary companions relate to the content of their private speech at other times. Thus, observing children while they are interacting with their imaginary companions would be useful. In addition, research could focus on children's engagement in private speech in other contexts (e.g., during cognitive planning tasks) to establish whether task-specific private speech is similarly related to children's imaginary companion status. Given the evidence for concordance in the use and degree of internalization of private speech across different contexts (Lidstone et al., 2011; Winsler

et al., 2003), one would expect task-based private speech to be similarly related to imaginary companion status, with imaginary companion group children's private speech being more internalized than that of their counterparts who do not have imaginary companions.

The current study is the first to investigate whether children's imaginary social engagement relates to their private speech development. Having an imaginary companion was proposed to give children more numerous opportunities for engaging in social dialogue, which should facilitate the development of private speech, in line with [Vygotsky's \(1934/1987\)](#) theory. The observed pattern of findings is consistent with the view that self-generated social speech between children and their imaginary companions may fulfill a similar facilitatory role as social speech with real-life partners. To explore this relation in greater detail, future research could investigate how individual differences in the extent to which children engage in dialogic exchange with their imaginary companions relate to the level of internalization of their private speech. If imaginary social exchange fulfills a similar role to actual social exchange in the developmental progression of private speech, children who engage most in dialogue with their imaginary companions should have the most internalized private speech.

Although the findings reported here are consistent with the view that imaginary social exchange may facilitate the internalization of private speech, given that imaginary companion status and private speech were assessed at the same point in time, it is important to consider the opposite direction of cause and effect; it could be that private speech is the driving force behind children's creation of imaginary companions. This possibility was raised by [Fernyhough and colleagues \(2007\)](#), who proposed that the internalization of social and private speech might result in young children's mental world becoming populated with voices in dialogic interplay. One result might be the construction of imaginary companions, which [Pearson \(1998\)](#) suggested could result from children's attempts to make essentially hallucination-like experiences more socially acceptable. Indeed, there is empirical evidence showing that children with imaginary companions are more likely than their counterparts who lack imaginary companions to report hearing words in ambiguous auditory stimuli ([Fernyhough et al., 2007](#); [Pearson et al., 2001](#)). Children who are precocious in their private speech development may create imaginary companions as a way of reifying and personifying this experience of an internal dialogue between different voices. Overt private speech often has a dialogic structure (e.g., [Berk & Garvin, 1984](#); [Kohlberg et al., 1968](#)), with children using self-answered questions and talking on behalf of toys. In addition, private speech and the ability to engage in internal dialogue have been linked to certain aspects of creativity ([Daugherty, White, & Manning, 1995](#); [Fernyhough, 2009](#)). [Fernyhough and colleagues \(2007\)](#) proposed that examining the developmental association between private speech and an imaginary companion might shed light on the causal relations between these two developmental phenomena.

Although the current data cannot settle the true direction of cause and effect, there is one reason for doubting that children's creation of imaginary companions is developmentally secondary to the internalization of private speech. The mothers' corroboration in the study reported here showed that the imaginary companions of these 5-year-olds were long-standing, having existed for a mean duration of more than 25 months. This suggests that many of the children's imaginary companions would have predated the development of private speech given that self-talk is typically assumed to peak during the late preschool years ([Berk, 1992](#); [Kohlberg et al., 1968](#)). To establish the true direction of cause and effect between imaginary companion status and private speech, longitudinal research is needed to attempt to pinpoint the exact time at which children created their imaginary companions in relation to their private speech development. Thus, charting the association between the developmental progression of private speech and the creation of and engagement with an imaginary companion is an interesting avenue for future research.

Investigating the relation between the length of existence of an imaginary companion and a child's private speech would also be worthwhile. One could hypothesize that having an imaginary companion at the time when the child's ability to communicate is developing most rapidly will have the greatest facilitatory effect on private speech development. Thus, the precise timing of the imaginary companion's existence in relation to the child's communication abilities, rather than the overall length of existence of the imaginary companion, may prove to be a crucial variable in understanding the longitudinal relation between having an imaginary companion and private speech. Although the current study obtained maternal report on the length of existence of children's imaginary companions, it

was not possible to tie in the imaginary companions' existence with the individual children's language and communication development. Moreover, half of the mothers were unaware that their children had imaginary companions, meaning that data on how long the companions had existed were available for only a small subgroup of the overall sample.

In summary, the results of the current study provide the first evidence that children's imaginary social engagement may relate to the development of private speech in a way similar to the role played by children's social interaction with real people. Although further research is needed to establish the precise nature of cause and effect in the relation between children's imaginary companion status and their internalization of private speech, our findings highlight the potential role of child-centered individual differences in the development of private speech, and thus extend previous research on social environmental influences on children's self-talk.

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References

- Al-Namlah, A., Fernyhough, C., & Meins, E. (2006). Sociocultural influences on the development of verbal mediation: Private speech and phonological recording in Saudi Arabian and British samples. *Developmental Psychology, 42*, 117–131.
- Al-Namlah, A. S., Meins, E., & Fernyhough, C. (2012). Self-regulatory private speech relates to children's recall and organization of autobiographical memories. *Early Childhood Research Quarterly, 27*, 441–446.
- Behrend, D. A., & Rosengren, K. S. (1992). The relation between private speech and parental interactive style. In R. M. Diaz & L. E. Berk (Eds.), *Private speech: From social interaction to self-regulation* (pp. 85–100). Hillsdale, NJ: Lawrence Erlbaum.
- Berk, L. E. (1986). Relationship of elementary school children's private speech to behavioral accompaniment to task, attention, and task performance. *Developmental Psychology, 22*, 671–680.
- Berk, L. E. (1992). Children's private speech: An overview of theory and the status of research. In R. M. Diaz & L. E. Berk (Eds.), *Private speech: From social interaction to self-regulation* (pp. 17–53). Hillsdale, NJ: Lawrence Erlbaum.
- Berk, L. E., & Garvin, R. A. (1984). Development of private speech among low-income Appalachian children. *Developmental Psychology, 20*, 271–286.
- Berk, L. E., & Landau, S. (1993). Private speech of learning disabled and normally achieving children in classroom academic and laboratory contexts. *Child Development, 64*, 556–571.
- Berk, L. E., & Potts, M. K. (1991). Development and functional significance of private speech among attention-deficit hyperactivity disordered and normal boys. *Journal of Abnormal Child Psychology, 19*, 357–377.
- Bouldin, P., & Pratt, C. (1999). Characteristics of preschool and school-age children with imaginary companions. *Journal of Genetic Psychology, 160*, 397–410.
- Daugherty, M., White, C. S., & Manning, B. H. (1995). Private speech and creativity. *Contemporary Educational Psychology, 20*, 222–229.
- Davis, P. E., Meins, E., & Fernyhough, C. (2011). Self-knowledge in childhood: Relations with children's imaginary companions and understanding of mind. *British Journal of Developmental Psychology, 29*, 680–686.
- Diaz, R. M., & Berk, L. E. (Eds.). (1992). *Private speech: From social interaction to self-regulation*. Hillsdale, NJ: Lawrence Erlbaum.
- Diaz, R. M., Neal, C. J., & Vachio, A. (1991). Maternal teaching in the zone of proximal development: A comparison of low- and high-risk dyads. *Merrill-Palmer Quarterly Journal of Developmental Psychology, 37*, 83–108.
- Duncan, R. M., & Cheyne, J. A. (1999). Functions of self-reported private speech in young adults: A self-verbalization questionnaire. *Canadian Journal of Behavioural Science, 31*, 133–136.
- Duncan, R. M., & Cheyne, J. A. (2002). Private speech in young adults: Task difficulty, self-regulation, and psychological predication. *Cognitive Development, 16*, 889–906.
- Dunn, L. M., Dunn, L. M., Whetton, C., & Burley, L. (1997). *The British Picture Vocabulary Scale* (2nd ed.). Windsor, UK: NFER-Nelson.
- Fernyhough, C. (2008). Getting Vygotskian about theory of mind: Mediation, dialogue, and the development of social understanding. *Developmental Review, 28*, 225–262.
- Fernyhough, C. (2009). Dialogic thinking. In A. Winsler, C. Fernyhough, & I. Montero (Eds.), *Private speech, executive functioning, and the development of verbal self-regulation* (pp. 42–52). Cambridge, UK: Cambridge University Press.
- Fernyhough, C., Bland, K. A., Meins, E., & Coltheart, M. (2007). Imaginary companions and young children's responses to ambiguous auditory stimuli: Implications for typical and atypical development. *Journal of Child Psychology and Psychiatry, 48*, 1094–1101.
- Fernyhough, C., & Fradley, E. (2005). Private speech on an executive task: Relations with task difficulty and task performance. *Cognitive Development, 20*, 103–120.
- Fernyhough, C., & Russell, J. (1997). Distinguishing one's own voice from those of others: A function for private speech? *International Journal of Behavioral Development, 20*, 651–665.

- Gleason, T. R. (2002). Social provision of real and imaginary relationships in early childhood. *Developmental Psychology, 38*, 979–992.
- Gleason, T. R. (2004). Imaginary companions: An evaluation of parents as reporters. *Journal of Infant and Child Development, 13*, 199–215.
- Gleason, T. R. (2005). Mothers' and fathers' attitudes regarding pretend play in the context of imaginary companions and of child gender. *Merrill-Palmer Quarterly Journal of Developmental Psychology, 51*, 412–436.
- Gleason, T. R., & Hohmann, L. M. (2006). Concepts of real and imaginary friendships in early childhood. *Social Development, 15*, 128–144.
- Gleason, T. R., Sebanc, A. M., & Hartup, W. W. (2000). Imaginary companions of preschool children. *Developmental Psychology, 36*, 419–428.
- Harris, P. (2000). *The work of the imagination*. Oxford: Blackwell Publishing.
- Hoaglin, D. C., & Iglewicz, B. (1987). Fine tuning some resistant rules for outlier labeling. *Journal of American Statistical Association, 82*, 1147–1149.
- Hollingshead, A. B. (1975). *Four factor index of social status*. Unpublished manuscript, Yale University.
- Kohlberg, L., Yaeger, J., & Hjertholm, E. (1968). Private speech: Four studies and a review of theories. *Child Development, 39*, 691–736.
- Kraft, K. C., & Berk, L. E. (1998). Private speech in two preschools: Significance of open-ended activities and make-believe play for verbal self-regulation. *Early Childhood Research Quarterly, 13*, 637–658.
- Lidstone, J. S. M., Meins, E., & Fernyhough, C. (2010). The roles of private speech and inner speech in planning in middle childhood: Evidence from a dual task paradigm. *Journal of Experimental Child Psychology, 107*, 438–451.
- Lidstone, J. S. M., Meins, E., & Fernyhough, C. (2011). Individual differences in children's private speech: Consistency across tasks, timepoints, and contexts. *Cognitive Development, 26*, 203–213.
- Lidstone, J. S. M., Meins, E., & Fernyhough, C. (2012). Verbal mediation of cognition in children with specific language impairment. *Development and Psychopathology, 24*, 651–660.
- Meins, E., Fernyhough, C., Arnott, B., Turner, M., & Leekam, S. R. (2011). Mother- versus infant-centered correlates of maternal mind-mindedness in the first year of life. *Infancy, 16*, 137–165.
- Meins, E., Fernyhough, C., de Rosnay, M., Arnott, B., Leekam, S. R., & Turner, M. (2012). Mind-mindedness as a multidimensional construct: Appropriate and nonattuned mind-related comments independently predict infant–mother attachment in a socially diverse sample. *Infancy, 17*, 393–415.
- Olsewski, P., & Fuson, K. C. (1982). Verbally expressed fantasy play of preschoolers as a function of toy structure. *Developmental Psychology, 18*, 57–61.
- Pearson, D. (1998). The social acceptability of children hearing voices. Doctor of clinical psychology thesis, University of Leicester.
- Pearson, D., Burrow, A., Fitzgerald, C., Green, K., Lee, G., & Wise, N. (2001). Auditory hallucinations in normal child populations. *Personality and Individual Differences, 31*, 401–407.
- Roby, A. C., & Kidd, E. (2008). The referential communication skills of children with imaginary companions. *Developmental Science, 11*, 531–540.
- Svendsen, M. (1934). Children's imaginary companions. *Archives of Neurology and Psychiatry, 2*, 985–999.
- Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics*. Boston: Allyn & Bacon.
- Taylor, M. (1999). *Imaginary companions and the children who create them*. Oxford, UK: Oxford University Press.
- Taylor, M., & Carlson, S. (1997). The relation between individual differences in fantasy and theory of mind. *Child Development, 68*, 436–455.
- Taylor, M., Carlson, S. M., Maring, B. L., Gerow, L., & Charley, C. M. (2004). The characteristics and correlates of fantasy in school-age children: Imaginary companions, impersonation, and social understanding. *Developmental Psychology, 40*, 1173–1187.
- Trionfi, G., & Reese, E. (2009). A good story: Children with imaginary companions create richer narratives. *Child Development, 80*, 1301–1313.
- Vygotsky, L. S. (1987). Thinking and speech. In R. W. Reiber & A. S. Carton (Eds.), *The collected works of L. S. Vygotsky, Vol. 1: Problems of general psychology* (pp. 37–285). New York: Plenum [Original work published in 1934].
- Winsler, A., De León, J. R., Wallace, B. A., Carlton, M. P., & Willson-Quayle, A. (2003). Private speech in preschool children: Developmental stability and change, across-task consistency, and relations with classroom behavior. *Journal of Child Language, 30*, 583–608.
- Winsler, A., Diaz, R. M., McCarthy, E. M., Atencio, D. J., & Adams Chabay, L. (1999). Mother–child interaction, private speech, and task performance in preschool children with behavior problems. *Journal of Child Psychology and Psychiatry, 40*, 891–904.
- Winsler, A., Feder, M., Way, E. L., & Manfra, L. (2006). Maternal beliefs concerning young children's private speech. *Infant and Child Development, 15*, 403–420.
- Winsler, A., Fernyhough, C., McClaren, E. M., & Way, E. (2004). *Private speech coding manual*. Unpublished manuscript, George Mason University.
- Winsler, A., Manfra, L., & Diaz, R. M. (2007). "Should I let them talk?" Private speech and task performance among preschool children with and without behavior problems. *Early Childhood Research Quarterly, 22*, 215–231.
- Winsler, A., & Naglieri, J. (2003). Overt and covert verbal problem-solving strategies: Developmental trends in use, awareness, and relations with task performance in children aged 5–17. *Child Development, 74*, 659–678.