



Caregivers' use of metacognitive language in child care centers: Prevalence and predictors

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ABSTRACT

Use of metacognitive language by child care center staff in classrooms that serve preschool-aged children was examined. Staff's use of mental-state talk, perspective-taking talk, and activity-relevant questioning with children were coded in a series of 20-s snapshots taken over the course of one full morning per classroom. A total of 3401 snapshots were observed for 393 teachers in 103 classrooms. Staff used mental-state talk in 22% of the snapshots, activity-relevant questions in 12%, and perspective-taking talk in 3%. Structural and process predictors of staff's metacognitive language were examined for full-time staff ($n = 148$ in 95 classrooms) using multilevel modeling and ordinary least squares regression. Caregiver positive interaction style predicted caregivers' engagement in all three types of language. Caregiver punitive interaction style was also a positive predictor of caregivers' talk about others' perspectives. In general, structural characteristics of the classroom were not significant predictors of staff's language. However, the proportion of children receiving a child care subsidy in the center negatively predicted perspective-taking discourse. Results indicate the importance of caregiver relational style in providing a more discourse-rich child care context.

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During the toddler and preschool years, children acquire a wide range of social-cognitive abilities that are crucial for their development of adaptive social behaviors (Frye & Moore, 1991). Much research has focused on the important role of children's social interactions with adults in fostering these skills, particularly with parents in the home environment (Carpendale & Lewis, 2004). However, more and more children today are cared for by nonparental caregivers outside the home (Lamb, 1998; Scarr, 1998). Child care centers serve a large number of children, and thus provide a fitting context for enriching preschool-aged children's development. Research suggests that teachers' social interactions with children in early child care environments are indeed important for children's social outcomes (Kontos & Wilcox-Herzog, 1997). Yet, it is still unclear how caregivers in child care interact with children, and more specifically whether they interact in ways that have been shown to promote children's social development (Astin & Pelletier, 1996). The purpose of this study is to explore the extent to which child care staff interact with children. Characteristics of the child care environment that may be associated with staff engagement in these behaviors are also examined.

1. Adult-child discourse and children's social understanding

Children's psychological understanding of persons' minds and behaviors includes their ability to reason about desires, emotions, and beliefs, attribute knowledge, take others' perspectives, and engage in pretense (Flavell, 2004). In this article,

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we will use the broader term *social understanding* to refer to these abilities of children's understanding of mind (Dunn, 1988). Children's development of social understanding is thought to be crucial for their social development more generally (Frye & Moore, 1991). Correlational studies demonstrate a significant association between children's social understanding and their social competence (Astington & Jenkins, 1995; Cassidy, Werner, Rourke, Zubernis, & Balaraman, 2003; Lalonde & Chandler, 1995; Slomkowski & Dunn, 1996; Watson, Nixon, Wilson, & Capage, 1999). For example, Lalonde and Chandler (1995) demonstrated that preschoolers' scores on measures of social understanding correlated positively with their scores on teacher-report measures of social maturity, specifically of behaviors that require some insight into their own and others' mental lives (e.g., understanding one's wishes during play). Furthermore, longitudinal studies provide compelling evidence that early social understanding acquired during the preschool ages predicts later proficiency in social interaction skills (e.g., Dunn, 1995; Jenkins & Astington, 2000). Jenkins and Astington (2000) indicated that 3- and 4-year olds' skills in social understanding predicted important social behaviors in play interactions with peers 7 months later. Given the importance of children's understanding of mind for their maturing social development, it is important to understand what factors may foster these abilities.

Of increasing interest in the literature is the robust association that exists between children's social interactions with adults, particularly their exposure to adult discourse, and children's development of social understanding (for theoretical and empirical reviews, see Carpendale & Lewis, 2004; de Rosnay & Hughes, 2006; Symons, 2004; see also Jenkins, Turrell, Kogushi, Lollis, & Ross, 2003). The literature suggests that adult discourse uniquely contributes to children's understanding of mind. For example, intervention studies have shown that among young children showing delays in their social-cognitive functioning, interventions that include language-rich discourse between the adult and child improved children's performance on standard tasks of social understanding, in comparison to interventions that include minimal use of language (e.g., Hale & Tager-Flusberg, 2003; Lohmann & Tomasello, 2003). In addition, research investigating young children's early childhood classroom experiences has shown that teachers' verbal interactions with children are positively related to their social competence, even after controlling for child age, cognitive competence, and family background measures (Kontos & Wilcox-Herzog, 1997; see also Phillips, McCartney, & Scarr, 1987). These findings may not be surprising given the strong links between children's own language abilities and their social understanding (Astington & Jenkins, 1999). However, these findings lend support to the unique importance of a discourse-rich environment.

Vygotskian theory provides a useful framework for understanding the important role of children's verbal interactions with adults in children's acquisition of social understanding. According to Vygotsky (1978), it is through these early interactions with caregivers that children are able to construct mental representations of their social world. Language plays a crucial role, as the discourse between an experienced adult and a novice child is the medium through which the child internalizes shared meaning about a topic. Accordingly, it is argued that adult discourse and the specific metacognitive linguistic cues embedded within adult discourse foster children's learning about psychological knowledge. In turn, the child will be able to consolidate and internalize this knowledge to use in subsequent experiences or social interactions (de Rosnay & Hughes, 2006).

With this foundation in place, it is important to understand what specific elements of adult discourse may promote children's understanding of mind most effectively. In the present study, we focused on three aspects of conversational interactions between caregivers and children that convey language of mind (i.e., metacognitive language): mental-state discourse, discourse about others' perspectives, and activity-relevant questioning. These aspects of discourse were selected because previous research on parent-child and/or teacher-child interaction has shown these aspects of metacognitive language to be important for children's own social understanding (e.g., Brown & Dunn, 1996; Carpendale & Lewis, 2004; Ruffman, Slade, & Crowe, 2002; Trawick-Smith, 1994). As such, it seems reasonable to extrapolate from research on social processes in the home and early school environments to those that may take place in child care centers. Research demonstrating the importance of the three types of discourse for children's social cognition will be addressed in turn.

1.1. *Mental-state discourse*

Mental-state discourse includes genuine and clearly articulated utterances in reference to mental life, such as think, know, believe, wonder, references to desire and preference (e.g., want, prefer), and references to emotional states (e.g., happy, sad) (see Ruffman et al., 2002 for a summary of mental-state utterances). Longitudinal evidence suggests that this specific metacognitive linguistic input is crucial for children's growing social understanding (Dunn, Brown, & Beardsall, 1991; Ruffman et al., 2002). Illustratively, in a longitudinal study by Ruffman et al. (2002), mothers were observed describing pictures to their children at three separate time points between the ages of 3- and 4-years old. The authors measured mothers' use of mental-state language and found that children whose mothers used more mental-state terms scored better on tasks measuring their understanding of desires, beliefs, and emotions at a later time point. Importantly, these findings remained significant even after controlling for previous child social-cognitive and linguistic abilities, as well as maternal non-mental-state talk. One study has also looked at the practice of mental-state discourse by kindergarten teachers (Astington & Pelletier, 1996). Teachers' teaching practices were captured during a 1-h period in the classroom and in a 1-h interview. Teachers used metacognitive terms much more frequently in their interactions with the adult interviewers than with children during teaching time. Only 12 of 20 teachers used any mental-state terms at all during the 1 h of teaching, with an average of 2.6 terms each. Although this rate of mental-state talk among teachers seems low, it does compare to the low rates of maternal mental-state talk observed in families (Jenkins et al., 2003).

1.2. Perspective-taking discourse

Conversations focusing on explanations of others' psychological perspectives, especially in direct relation to behaviors (i.e., psychological causality) are also important in aiding young children's exploration and understanding of others' mental states. For example, longitudinal studies have shown that preschool children's participation in family discourse about causality (where talk about perspectives in relation to behavior, such as "You broke my glass and that makes me sad," predominated) is related to their emotional understanding both in the short-term (Dunn, Brown, Slomkowski, & Tesla, 1991) and later in childhood (Brown & Dunn, 1996). Additional evidence comes from research on the effects of parental verbal behavior during conflict with their child or during mediation of child conflict. In a conflict situation, effective strategies for managing children's behavior involve inductive, other-oriented reasoning that help children become aware of and explore the other person's perspective (e.g., "he doesn't like that," "she didn't know," "now she's sad") (Perlman & Ross, 1997). In a prospective longitudinal study of 30-month olds, Laible and Thompson (2002) assessed the quality of mothers' discourse with children during conflict in both the home and lab environments. They found that psychological references to their needs and emotions during their justifications of behavior with their 30-month old children predicted children's early conscience development six months later.

1.3. Activity-relevant questioning

Activity-relevant questioning involves adults' active (though not intrusive), responsive, and supportive questioning of children's actions and thoughts as they engage in play or other activities. This aspect of conversation involves an element of linguistic scaffolding, in which the adult must take the perspective of the child and engage in shared dialogue about meaningful activities that operate within the child's "zone of proximal development." This provides the child with the opportunity to reason, integrate, and consolidate knowledge about social information and norms (Nyland, 2004; Vygotsky, 1978). While children's play may be self-directed, teachers can enrich the learning potential of children's activities through their carefully crafted questioning behaviors (Trawick-Smith, 1994). Indeed, Trawick-Smith (1994) suggests that asking cognitively challenging questions to children during play is an important intervention tool for promoting positive child outcomes, including social understanding. Research in preschool settings supports this stance. Kontos and Wilcox-Herzog (1997) found that children's social competence was positively related to teachers' engagement in higher level verbalizations, including nonelaborative or elaborative questioning of children's activities.

To summarize, there is evidence that a child's conversational environment plays an important didactic role in their socialization, particularly in their development of social understanding. Three components of adults' discourse contribute to its didactic function: mental-state discourse, discourse about others' perspectives, and activity-relevant questioning. Investigations of adult metacognitive discourse in child care are scant. Recent research has focused on caregivers' talk in the context of language development (Dickinson, Darrow, & Tinubu, 2008; Gest, Holland-Coviello, Welsh, Eicher-Catt, & Gill, 2006). Results from these studies describe the extent to which caregivers' engage in particular linguistic strategies that have been shown to promote children's language development. Yet, little is known about caregivers' use of linguistic strategies to promote children's social understanding and we still do not know the extent to which caregivers engage in such talk to provide a developmentally enhancing context. Thus, the first goal of the present study is to investigate, through naturalistic observation, the conversational environment of the child care context and determine how often caregivers engage in mental-state discourse, discourse about others' perspectives, and activity-relevant questioning.

2. What factors predict caregivers' use of metacognitive language in child care?

The second goal of the present study is to investigate the factors associated with child care teachers' use of metacognitive talk, an issue that is important for practice with respect to young children. Within the parenting literature, significant factors have been shown to predict mothers' use of metacognitive discourse and/or children's social outcomes, such as maternal level of education (Ruffman et al., 2002), family size and number of siblings (Jenkins & Astington, 1996), and the quality of the adult-child relationship and maternal warmth and positivity (Meins, Fernyhough, Russell, & Clark-Carter, 1998; Symons & Clark, 2000). Thus, both structural (child-staff ratio, class size, teacher education) and process (teachers' interaction style with children) indicators will be included to assess the likelihood that teachers will use language of mind in their discourse with children.

Structural indicators refer to characteristics of the child care environment that are generally easier to legislate and monitor. While they are less directly connected to children, they may create conditions in the environment that support children's experiences (Vandell & Wolfe, 2000). Child-staff ratio, classroom group size, and teacher's level of formal education have all been examined as factors in predicting children's social development in the child care context (Howes & Olenick, 1986; Howes & Rubenstein, 1985; Howes, Whitebrook, & Phillips, 1992). Accordingly, in the current study, they are hypothesized to be important predictors of metacognitive linguistic cues used by teachers. That is, caregivers' use of efficient socialization strategies may be contingent upon the number of adults available to assist, the number of children for whom each adult is responsible, and their level of formal education.

Process indicators refer to aspects of the environment connected to children's experiences more directly (Vandell & Wolfe, 2000). The closeness of the caregiver-child relationship has been shown to be an essential process indicator for pre-

dicting children's adaptive outcomes in child care, including their social understanding and competence (Howes, Hamilton, & Matheson, 1994; Kienbaum, 2001; Peisner-Feinberg et al., 2001). Caregivers who interact with children in a warm, sensitive, and responsive fashion are more likely to have secure and positive relationships with the children they care for (Howes et al., 1994). Such relationships are marked by open communication and trust, and provide children with more opportunities to explore psychological knowledge with their caregivers, including metacognitive language (Goldstein, 1999; Raikes & Thompson, 2006). Thus, it is hypothesized that caregiver interaction style will be associated with their use of metacognitive language with children.

In addition, two important factors will be examined as possible covariates: (1) the proportion of general verbal exchange, not specific to metacognitive language (e.g., "Today is a nice day"), and (2) the proportion of children receiving subsidized care in the child care center. Overall proportion of general verbal exchange with children is important to consider, as it is possible that those caregivers who generally talk more with children simply have more opportunities and thus a higher likelihood of engaging more in metacognitive discourse (Ruffman et al., 2002). In addition, the interplay between family demographic variables, such as socioeconomic status and neighborhood poverty, on child care quality and child outcomes is well documented (LoCasale-Crouch et al., 2007; Phillips, Voran, Kisker, & Howes, 1994). In general, the literature suggests that children from lower income families do not consistently receive the same standard of child care quality on a variety of indices than children from higher income families (LoCasale-Crouch et al., 2007; Phillips et al., 1994). Thus, we included a measure of the proportion of children within each center who come from low income families, as indexed by their receiving a child care subsidy (which is awarded based on their family's financial need), as a possible covariate of caregivers' discourse with children.

The current study uses a relatively novel method in child care research to answer its substantive questions: multilevel modeling (MLM; Bryk & Raudenbush, 1992; Goldstein, 2003). This is a regression-based technique that accounts for the nested structure of the dataset (i.e., children within classrooms within child care centers) and partitions the variance into the corresponding levels of effect. This is important, as it allows researchers to differentiate between factors in child care settings that are shared among all individuals (e.g., teachers) within a classroom, or all classrooms within a center, and we can gain some clarity on the ways in which these child care factors are associated with the functioning of individuals.

In summary, this study is designed to address two questions:

- (1) To what extent do staff in child care centers engage in the following types of metacognitive discourse with children in their classrooms: (1) mental-state discourse, (2) discourse about others' perspectives, and (3) activity-relevant questioning? Given the low rates at which parents have been found to use these, we expected that staff will engage in these types of discourse, but not very frequently.
- (2) What structural and process indicators of child care quality are associated with staff's engagement in these components of language of mind? Structural indicators that will be assessed include child-staff ratio, group size, and teacher level of formal education. Process indicators include positive caregiver interaction style and punitive caregiver interaction style. When classroom characteristics represent higher quality of care (i.e., lower child-staff ratios, smaller group sizes, higher levels of formal education, and caregiver interactions characterized by positive, rather than punitive, styles), we expected caregivers to engage in more metacognitive discourse with children. Two covariates will be controlled for, including the amount of general talking between staff and children and the center-level proportion of child care subsidy rates.

3. Method

3.1. Procedure

Sixty-four child care centers were recruited through a partnership with the City of Toronto which oversees the quality of care in all licensed child care providers in the Greater Toronto Area. All of the centers are licensed and are not-for-profit. Only classrooms serving preschool-aged children, between the ages of 3 and 5, were assessed. In centers that had one or two classrooms of 3- to 5-year olds, all classrooms were assessed. When centers had three or more classrooms, only two of the classrooms were randomly selected for assessment. Twenty-five centers had one classroom and 39 centers had two (or more) classrooms, resulting in a sample of 103 classrooms of 3- to 5-year olds. The mean number of children in a center was 59.90 (SD = 16.87) and the mean number of children per classroom was 17.19 (SD = 4.48).

Data were collected in each of these participating child care classrooms over a 1-week period between February and July 2006. Two data collectors conducted the observations reported in this study. Data collection proceeded in each classroom in the mornings (between approximately 7:00 AM until 11:30 AM). Prior to the beginning of data collection, center directors were asked to identify the individuals who staffed the classrooms included in our data collection. These staff members were surveyed and make up the 194 staff for whom background information is available. However, to capture children's experiences more completely, we decided to collect the observational data on all the staff who were present in the classroom on the day of our observations. In total, observations were conducted for 393 staff members. Thus, the data reveal that there was a significant number of staff in these rooms who were not considered full-time, permanent staff members by the directors. Further information about these individuals is not available in this study. It is important to note that staff:child ratio counts were taken every 30 min in these rooms and these are fairly stable across the observation window (unfortunately, the ratio counts do not identify individual staff). This suggests that staff come and go and this raises very important questions

about the stability of staffing in child care center classrooms. No child assent procedures were implemented because these observations were conducted at the teacher level with the teacher as the focus, because no identifying information was collected about the children and because of the non-intrusive, observational nature of the data collection (i.e., the children were never directly interviewed, assessed, or questioned).

Observations of all staff were conducted in 20-s snapshots and were collected over a period of 2.5 h. Staff observations started once a minimum of four children arrived in the classroom in the morning. Data collectors randomly selected the order in which they observed all the staff in the room. They observed a staff member for 20 s, coded their behavior and then moved on to the next staff member. Once they completed a 20-s observation for each staff member present in the room, the data collectors conducted observations of four children in the room. They then returned to conduct the next “cycle” of staff observations following the same order as they conducted in the first cycle. This continued until lunch time. Following each 20-s snapshot, a fairly extensive set of staff behaviors were coded. These captured structural elements of their interactions (e.g., were they engaged in one-on-one, small group, or whole group activities with children), the type of instruction staff engaged in (see *Perlman & Fletcher, 2008* for an example of the literacy instruction codes that were collected) and the warmth and responsivity they directed toward children. Staff and children move frequently in these classrooms and maintaining physical proximity to teachers and children was necessary to collect these data. In order to minimize the intrusiveness of the data collection protocol and maximize the validity of our observations, we followed the data collection methods of *Howes and others (Howes, James, & Ritchie, 2003; Wishard, Shivers, Howes, & Ritchie, 2003)* and conducted “live” coding of snapshots rather than video recording which would have required data collectors to follow staff and children with videocamera in hand.

Observers underwent extensive training prior to the start of data collection and at two time points during the data collection period as checks for observer drift. For data collection to proceed, observers had to meet a minimum criterion of kappas greater than .60 on all measures overall and a percent agreement greater than 80%. The average and range of percent agreement across the two data collectors and three trials is as follows: 86% (75–100%) for mental-state talk, 95% (90–100%) for perspective-taking talk, and 92% (83–100%) for activity-relevant questioning. A total of 393 child care staff, including permanent, part-time, and volunteer staff, from 103 classrooms were observed. The Teacher Surveys were dropped off in the classrooms on the day of data collection and a time was scheduled within the period of a couple of weeks to pick up the forms. As noted, only permanent staff assigned to a classroom were asked to participate in the Teacher Survey. The response rate was 96%. A total of 194 permanent child care staff from 100 classrooms completed the Teacher Survey and were paid \$20.00 in appreciation for their time.

3.2. Participants

In the current study, two subsamples of participants were used, one for descriptive analyses of the outcome variables, and one for inferential analyses. For descriptive reports of the outcome variables (to assess how often staff engage in metacognitive linguistic behaviors with children), all child care staff, including permanent, part-time, and volunteer staff, observed in the classrooms were included ($N = 393$ child care staff; $M = 5.09$ child care staff per classroom).

For inferential analyses (to assess the factors that predict staff’s metacognitive language), only those permanent staff for whom we had observational data *and* had completed the Teacher Survey, were included. Part-time and volunteer staff did not complete the Teacher Survey, and were thus not included in the inferential analyses. Not all permanent staff who completed the Teacher Survey ($n = 194$) had observational data, and these staff ($n = 26$) were excluded from the inferential analyses.

Missing data on the single predictors of interest among the remaining teachers in the sample were very low (1.9% on average, and ranged from 0% to 8.9%). In an attempt to avoid sacrificing data and introducing bias into the sample through listwise deletion (*Little & Rubin, 1987*), we attempted to treat the missing data using a method suitable for hierarchical data called multivariate mean value imputation (MCMC; *Browne, 2003*). Unfortunately the imputation model would not converge when all the variables in the scientific model were included in the imputation model. This is a common problem that can be due to many factors including the complexity of the model (e.g., trying to estimate too many variables simultaneously), the distribution of variables (e.g., categorical variables can be problematic), the intercorrelation of variables, as well as other issues (*Allison, 2002; Goldstein, 2003; Gullion et al., 2008*). Given the lack of convergence of the full imputation model and the very low rate of missing data, listwise deletion was used. The overall final sample size for the inferential analyses was $N = 148$ teachers, in 95 classrooms, in 62 centers ($M = 1.4$ teachers per classroom, $SD = .55$). The number of observations made of these 148 full-time staff in these 62 classrooms ranged from 1 to 27 observations ($M = 12.07$, $SD = 5.59$).

3.3. Measures: metacognitive language

As previously mentioned, 20-s observations of staff were conducted in classrooms over a period of 2.5 h. These focused on staff engagement with children, including the type of linguistic interactions they engage in. Three specific types of staff discourse were observed and are examined in the present study: staff mental-state discourse, perspective-taking discourse, and activity-relevant questioning. Whenever staff’s dialogue included more than one type of discourse, the dialogue received a score for each relevant code. For example, a perspective-taking statement may also have included a mental-state word, and thus the statement would have received a code for both mental-state discourse and perspective-taking discourse (see below).

3.3.1. *Mental-state discourse*

Data collectors recorded the number of times staff used mental-state words or feeling words in their discourse. These include terms such as “think, feel, want, wish, need, desire, know, believe, understand, expect, wonder, dream, afraid, care, hope, mad, sad, glad, scared, like, favorite,” and so forth (see Ruffman et al., 2002). An instance of mental-state discourse was coded for each mental-state or feeling word uttered. Coding included any situation in which the staff used mental-state talk in activities, such as story reading and pretend play. A sum of the total number of instances over the course of the period of observation was taken for each staff member observed. The sum was then divided by the total number of times each staff member was observed, such that each staff member received a score for the proportion of mental-state talk they engaged in with children.

3.3.2. *Perspective-taking discourse*

Data collectors recorded the number of times staff used dialogue that modeled taking the perspective of others or suggested that a child think about another’s perspective (e.g., “You don’t hit because it makes people sad”). This also included instances where staff told a child what another person is thinking or feeling (e.g., “John is happy right now,” “Jane thinks that sharks will be in the water”), and where staff encouraged a child to think about the perspectives of a nonhuman character (e.g., “Why is the puppet crying?,” “What do you think the bird in the book is feeling right now?”). Generally, a command having an explanation would also be included in this code (e.g., “Slow down so your friends can see”), because it helps children understand the perspective of others. An instance of perspective-taking discourse was coded for each phrase utterance that conveyed the idea of taking another’s perspective or showed that two people have different perspectives (see examples above). A sum of the total number of instances over the course of the period of observation was taken for each staff member observed. The sum was then divided by the total number of times each staff member was observed, such that each staff member received a score for the proportion of perspective-taking talk they engaged in with children.

3.3.3. *Activity-relevant questioning*

Data collectors recorded the number of times staff attempted to extend a child’s knowledge by asking questions that were related to the current activity. Examples of this type of discourse include instances in which a child is engaging in some activity (e.g., playing, reading, arts and crafts, dress-up, etc.), and the instructor asks questions such as: “You colored the sky green. What color is the sky outside?,” “Monkeys and humans are both mammals. What do they have in common?” It is not enough that the question was simply related to the child’s activity. It must have been instructional in nature, such that it was designed to help the child reason beyond his/her current knowledge (i.e., scaffolding). An instance of activity-relevant questioning was coded for each question uttered that was designed to help a child reason past his or her own knowledge. A sum of the total number of instances over the course of the period of observation was taken for each staff member observed. The sum was then divided by the total number of times each staff member was observed, such that each staff member received a score for the proportion of activity-relevant questioning they engaged in with children.

3.4. *Measures: covariates*

3.4.1. *General verbal exchange*

Within each of the 20-s snapshots, data collectors recorded the instances in which staff were observed engaging in general verbal exchange, or simply chatting with a child, whereby the language was not specific to metacognitive language (e.g., “Today is a nice day,” “How are you today?,” “You had a nice weekend”). This teacher-level measure was used in the current study as a measure of the overall level of verbal interactions each staff member engages in with children. Recall that this is an important variable to consider in the analyses because those teachers who talk more in general are simply expected to have more opportunities to engage in metacognitive talk. A proportion of general verbal exchange for each staff member was calculated by dividing their total number of snapshots in which general verbal exchange was observed by their total number of observations. The mean proportion of general verbal exchange observed in each classroom was .04 (SD = .07).

3.4.2. *Subsidized care*

In Toronto, child care subsidies are provided through the municipal government. The City tracks subsidies and was able to provide us with the number of children receiving subsidies within a given age group in each of the centers involved in the current study. The number of children receiving subsidy on a given day (April 15, 2006) approximately in the middle of data collection period was used. The number of children receiving subsidies in classrooms that served preschool-aged children was used. This number was divided by the total number of children registered in the center at the same point in time to create a proportion of children receiving subsidized child care at the center level. The eligibility criteria for a subsidy are very complex. As in many places, to be eligible, families must have very low family incomes making this a good estimate of the proportion of families with low incomes served by a given child care center. The mean proportion of children receiving subsidized care in each center was .84 (SD = .32).

3.5. Measures: predictors

3.5.1. Child–staff ratio

Ratios were defined as the proportion of children to staff present in the evaluation classroom. The number of children and staff present in classrooms was recorded at every half-hour interval during the observation period producing a child–staff ratio for each time interval. Staff included permanent full-time, permanent support, and casual/temporary staff members (students, volunteers, and interns were not counted as staff). Preliminary analyses revealed that most centers did not have data for the 7:30 AM and 12:00 PM time points, as children had not yet arrived and had left the classroom for the lunch hour, respectively. Therefore, these two time points were dropped and an observation period from 8:00 AM to 11:30 AM was used. An average child–staff ratio for each classroom was computed by dividing the sum of the child–staff ratios at each time point by the total number of time points. The mean number of children per teacher (child:staff ratio) for the sample of 95 classrooms in the current study was 5.87 (SD = 1.41).

3.5.2. Class size

Class size was operationally defined as the total number of children present in a room when the ratio data was collected. As with ratio calculations, class sizes were based on an observation period from 8:00 AM to 11:30 AM. An average class size for each classroom was computed by dividing the sum of the number of children at each time point by the total number of time points. The mean class size for the current sample of 95 classrooms was 10.72 (SD = 2.72).

3.5.3. Staff formal education

In the Teacher Survey, staff members were asked to report on their maximum educational degree achieved. Thus, this predictor was measured at the teacher level. The percentage of staff in the current study ($N = 148$) with no formal education was 7.2%, a community college degree was 81.7%, and a Bachelor's degree or above was 18.3%. Preliminary analyses indicated no substantive difference in the results if these categories remained as three separate groups or if two of the categories were collapsed and we included only two groups in the analyses. Thus, for simplicity and clarity, the categories for staff education were recoded such that “no formal education or community college degree” received a score of 0 and “Bachelor's degree or higher” received a score of 1.

3.5.4. Caregiver interaction style

The Caregiver Interaction Scale (CIS, also referred to as the Arnett; [Arnett, 1989](#)) is a 26-item measure that assesses the quality and content of teachers' interactions with their students on the basis of a 45-min observation. The scale provides information on socialization practices, with items tapping the emotional tone, discipline style, and responsiveness of classroom caregivers. The measure uses a 4-point Likert-type rating which ranges from not at all (1) to very much (4). Two data collectors observed each staff member present in a classroom for 45 min or more before completing the CIS. If data collectors felt that they had not observed a specific staff member sufficiently, they were permitted not to complete the CIS. The items from the CIS that assess staff members' positive interaction style (warm, enthusiastic, and developmentally appropriate behavior) and punitive interaction style (harsh, hostile, and overly controlling) were used in the current study. The positive interaction subscale consisted of 10 items, and thus the scale could range from a score of 0 to 40, with higher scores being more positive. The punitive interaction subscale consisted of 8 items, and thus this scale could range from a score of 0 to 32, with higher scores being more punitive. The mean score of teacher's positive interaction style, at the teacher level, was 29.95 (SD = 5.76), and of teacher's punitive interaction style was 8.46 (SD = 2.49). The percentage of agreement between the raters reached 80% or higher, which exceeds the reported minimum of 75% agreement for the scale's reliability ([Arnett, 1989](#)).

4. Results

4.1. How often do caregivers engage in metacognitive language with children in child care?

A total of 3401 20-s snapshots were collected for 393 permanent, part-time, and volunteer staff. The mean proportion of child care staff's engagement in mental-state discourse with children in their classrooms was .22 (SD = .24). This means that, on average, all staff used mental-state terms with children in 22% of the 3401 individual 20-s observations. The mean proportion of perspective-taking talk was much lower at .03 (SD = .09). And, the mean proportion of activity-relevant questioning was also lower at .12 (SD = .17).

4.2. What factors predict caregivers' use of metacognitive language in child care?

Table 1 provides descriptive statistics for the variables used in the inferential analyses of the present study, with data on 148 permanent staff (as described in Section 3) included in these analyses. The intercorrelations of variables used in the analyses are in **Table 2**. Of the outcome variables, mental-state discourse correlated significantly with perspective-taking discourse ($r = .18, p < .05$) and with activity-relevant questioning ($r = .31, p < .01$). Also of note, two of the outcome variables – mental-state discourse and activity-relevant questioning – correlated significantly with positive caregiver interaction style ($r = .27, p < .01$; $r = .38, p < .01$, respectively). Similarly, activity-relevant questioning correlated significantly and negatively with

Table 1
Summary of descriptive statistics for covariates and predictors ($N = 148$).

Variable	Mean	Standard deviation
Centre-level		
Proportion of subsidy	.84	.32
Class-level		
Child–staff ratio	5.87	1.41
Class size	10.72	2.72
Staff-level		
Proportion of general verbal exchange	.04	.07
Teacher education		
None or CC degree (%)	81.7	
Bachelor or higher (%)	18.3	
Caregiver positivity (CIS)	29.95	5.76
Caregiver punitiveness (CIS)	8.46	2.49

CC: community college; CIS: Caregiver Interaction Scale.

caregiver punitive interaction style ($r = -.22, p < .01$). One further correlation was found between center subsidy enrolment rate and staff perspective-taking discourse, in a negative direction ($r = -.17, p < .05$). No other significant correlations were found between the hypothesized predictors and the staff outcome variables. However, two further significant associations of interest were found among the predictors: The center-level mean of subsidized enrolment correlated negatively with child–staff ratio ($r = -.30, p < .01$) and negatively with caregiver positive interaction style ($r = -.23, p < .01$).

4.2.1. Data analysis strategy

Because of the nested structure of the data (teachers within classrooms within child care centers), we conducted preliminary analyses to assess whether multilevel modeling was appropriate. As previously mentioned, MLM is a regression-based technique that partitions variance into the corresponding levels of effect to the data. In this study the data structure has three levels: Level 1 is the ‘within-classroom’ level, Level 2 is the ‘within-center’ level, and Level 3 is the ‘between-center’ level. The within-classroom variance estimate indicates the extent to which teachers within the same classroom differ from one another in their metacognitive language. The within-center variance estimate represents the extent to which different classrooms within centers differ from one another on the classroom mean of teacher metacognitive language. And, the between-center variance estimate represents the extent to which centers differ from one another on the center mean of teacher metacognitive language.

MLM analyses were conducted using MlwiN version 2.02 (Rasbash, Browne, Healy, Cameron, Charlton, 2005). A null model was run for each of the three outcome variables. No predictor variables were entered into the null model. Stated simply, this model shows how much of the variance in staff’s metacognitive talk is at the within-classroom, between-center, and within-center levels. MLM should only be used for subsequent analysis of the data if the null model reveals that multiple levels of data structure are required to best describe the data (i.e., there is significant clustering at different levels). This is determined by examining whether omitting the highest level (or levels) of the data structure significantly decreases the fit of the model (determined by a change in the loglikelihood when models of 2 and 3 levels are compared with one another). If multiple levels are not required to accurately represent the data it means that there is no clustering in the data. Thus if the between-center variance is not significant, this means that teachers in a center do not show any greater similarity with

Table 2
Correlation matrix of type of metacognitive language, covariates, and predictors ($N = 148$).

	Mental-state discourse	Perspective-taking discourse	Activity-relevant questioning	General verbal exchange	Centre subsidy rate	Child–staff ratio	Class size	Bachelor degree or higher	Caregiver positivity
Mental-state discourse	1								
Perspective-taking discourse	.18*	1							
Activity-relevant questioning	.31**	.01	1						
General verbal exchange	.16*	.06	-.01	1					
Centre subsidy rate	-.07	-.17*	.01	-.03	1				
Child–staff ratio	-.05	-.06	-.00	-.05	-.30**	1			
Class size	-.12	-.03	-.16	.11	-.06	.47**	1		
Bachelor degree or higher	-.09	-.01	.02	.00	-.07	.05	.02	1	
Caregiver positivity	.27**	.12	.38**	.07	.23**	.11	.01	-.05	1
Caregiver punitiveness	-.11	.08	-.22**	-.07	.14	.02	.06	.02	-.62**

* $p < .05$.

** $p < .001$.

Table 3

Summary of two-level model of fixed effects and within- and between-classroom variance estimates in the prediction of caregivers' mental-state discourse ($N = 148$).

	Model 1 <i>B</i> (SE)	Model 2 <i>B</i> (SE)	Model 3 <i>B</i> (SE)	Model 4 <i>B</i> (SE)	Effect size
Fixed effects					
Intercept	−1.43 (.02)*	−1.43 (.05)*	−1.33 (.12)*	−1.76 (.19)*	
Centre level:					
Subsidy		−.03 (.06)	−.03 (.06)	−.00 (.06)	
Classroom level:					
Child–staff ratio			.00 (.02)	−.01 (.02)	
Class size			.02 (.00)	−.01 (.01)	
Caregiver level:					
General verbal exchange		.48 (.20)*	.50 (.20)*	.45 (.19)*	2.22
Bachelor or higher			−.04 (.04)	−.03 (.04)	
Positivity				.01 (.00)*	.06
Punitiveness				.01 (.01)	
Random effects					
Between classrooms	.018 (.01)*	.018 (.01)*	.017 (.01)*	.016 (.01)*	
Within classrooms	.022 (.00)*	.021 (.00)*	.021 (.00)*	.019 (.00)*	
−2' log likelihood	−67.53	−73.58	−76.67	−87.93	
Change in model fit (χ^2)		6.05*	3.09	11.26**	
Dfs		2	3	2	

* $p < .05$.

** $p < .001$.

one another than two teachers randomly chosen from the dataset. If the within-center variance is not significant, this means that teachers in a classroom do not show any greater similarity with one another than two teachers randomly chosen from the dataset. This lack of clustering means that data points can be treated as if they are all independent of one another. If clustering is not evident, ordinary least squares (OLS) regression is an appropriate analytic technique.

The three-level null model for the outcome variables mental-state discourse and activity-relevant questioning indicated that only two levels were necessary to accurately represent the data (the within-classroom and the between-classroom, or within-center, levels) and the implications of this are discussed more fully below. The variances at the between-center and within-center levels were not significant for perspective-taking discourse and consequently OLS regression was used to examine this aspect of metacognitive language.

Parallel analyses for each of the dependent variables were conducted and are discussed in turn below. The effects of predictor variables (assessed at different levels of the data structure) are presented in the top portion of Tables 3–5, and variance estimates for the different levels of the data structure are presented in the bottom portions of these tables. An estimate that is approximately twice the size of its standard error is significant ($p < .05$). If a predictor entered into the model is

Table 4

Summary of one-level model of fixed effects and variance estimates in the prediction of caregivers' perspective-taking discourse ($N = 148$).

	Model 1 <i>B</i> (SE)	Model 2 <i>B</i> (SE)	Model 3 <i>B</i> (SE)	Model 4 <i>B</i> (SE)	Effect size
Fixed effects					
Intercept	−1.65 (.01)*	−1.63 (.02)*	−1.59 (.03)*	−1.73 (.06)*	
Centre level:					
Subsidy		−.03 (.02)*	−.04 (.02)*	−.04 (.02)*	.60
Classroom level:					
Child–staff ratio			−.01 (.00)	−.01 (.00)	
Class size			.00 (.00)	.00 (.00)	
Caregiver level:					
General verbal exchange		.05 (.07)	.04 (.07)	.04 (.07)	
Bachelor or higher			−.00 (.01)	−.00 (.01)	
Positivity				.003 (.00)*	.05
Punitiveness				.007 (.00)*	.11
Random effects					
Within classrooms	.004 (.00)*	.004 (.00)*	.004 (.00)*	.004 (.00)*	
−2' log likelihood	−388.95	−393.58	−395.57	−403.93	
Change in model fit (χ^2)		4.63	1.99	8.36*	
Dfs		2	3	2	

* $p < .05$.

Table 5

Summary of two-level model of fixed effects and within- and between-classroom variance estimates in the prediction of caregivers' activity-relevant questioning ($N = 148$).

	Model 1 <i>B</i> (SE)	Model 2 <i>B</i> (SE)	Model 3 <i>B</i> (SE)	Model 4 <i>B</i> (SE)	Effect size
Fixed effects					
Intercept	–1.53 (.01)*	–1.52 (.04)*	–1.48 (.08)*	–1.85 (.13)*	
Centre level:					
Subsidy rate		–.01 (.04)	–.00 (.04)	.04 (.04)	.07
Classroom level:					
Child–staff ratio			.01 (.01)	.01 (.01)	
Class size			–.011 (.01)*	–.01 (.005)*	.07
Caregiver level:					
General verbal exchange		–.07 (.16)	–.02 (.16)	–.08 (.15)	
Bachelor or higher			.00 (.03)	.02 (.03)	
Positivity				.01 (.00)*	
Punitiveness				.00 (.01)	
Random effects					
Between classrooms	.007 (.00)*	.007 (.00)*	.006 (.00)*	.004 (.00)*	
Within classrooms	.015 (.00)*	.014 (.00)*	.014 (.00)*	.013 (.00)*	
–2' log likelihood	–155.65	–155.92	–159.76	–183.55	
Change in model fit (χ^2)		.27	3.84	23.79**	
Dfs		2	3	2	

* $p < .05$.

** $p < .001$.

significant, there will be a drop in the variance estimates at the different levels. In the present study, each analysis consisted of four models that were run sequentially, and each model was compared with the previous model using change in loglikelihood to determine whether the addition of new parameters improved the fit of the model. As previously mentioned, the Null Model, Model 1, did not include any predictor variables. In Model 2, the covariates, general verbal exchange and subsidy, were entered. Model 3 included the structural class-level indicators child–staff ratio and class size, and the structural staff-level indicator teacher degree (bachelor degree or higher). Finally, in Model 4, the teacher-level process variables of interest were added: positivity and punitiveness. Prior to conducting analyses, all continuous predictor variables were centered (Singer & Willett, 2003). In addition, a preliminary examination of the distribution of the data indicated that the outcome variables were positively skewed. Therefore, a logarithm transformation of the three outcome variables was applied prior to conducting the regression analyses. We also reported a simple effect size for significant predictors in Tables 3–5. In accord with journal standards, the effect size was calculated as the coefficient divided by the outcome standard deviation (Cooper & Hedges, 1994).

4.2.2. Mental-state discourse

The two-level null model allowed us to examine similarity between teachers within-centers on their mental-state discourse. The intraclass correlation (ICC), calculated on the proportion of center-level variance over the total variance (.018/.018 + .022), revealed that 55% of the variance in staff's use of mental-state terms was within classrooms and 45% of the variance was between classrooms. In Model 2, proportion of general verbal exchange was a significant predictor of mental-state discourse ($B = .48$, $SE = .20$), suggesting that staff who engage in general verbal exchange with children talk more about mental states. Proportion of children on subsidy was not significant. In Model 3, the structural variables child–staff ratio, class size, and staff degree were not significant predictors. Finally, in Model 4, positive caregiver interaction style was found to be a significant predictor of staff mental-state discourse ($B = .01$, $SE = .00$). Staff who interact more positively with children are more likely to engage in more mental-state discourse. Punitive interaction style was not significant. In the final model, the addition of all the predictors accounted for 13.6% of the variance at Level 1 (.022 – .019/.022) and 11.1% of the variance at Level 2 (.018 – .016/.018). (Variance estimates for Model 1 are compared with those in the final model.)

4.2.3. Perspective-taking discourse

There was no evidence of clustering either within-centers or classrooms, as described above. Therefore, an ordinary least squares regression analysis was conducted to examine what factors predict child care staff's use of perspective-taking discourse. Models were analyzed sequentially as in the previous two analyses, revealing a similar pattern of results. Specifically, in Model 2, general verbal exchange was not significant. However, center proportion of subsidy was a significant and negative predictor of perspective-taking talk ($B = -.034$, $SE = .017$). The higher the mean proportion of children receiving subsidized care in a center, the less staff in that center will engage in perspective-taking discourse. In Model 3, the structural variables (child–staff ratio, class size, and staff degree) were not found to be significant predictors. The final model revealed that both positive and punitive caregiver interaction style were significant and positive predictors of staff perspective-taking discourse with children ($B = .003$, $SE = .001$; $B = .007$, $SE = .002$, respectively). The addition of these variables in the final model

accounted for 9.7% of the variance in individual child care staff's use of perspective-taking discourse in the null model (.004 – .0038/.004). This result suggests that both positive and punitive engagement with children is associated with staff's use of perspective-taking discourse. However, this result does not necessarily imply that the manner in which teachers engage with young children does not matter. The processes through which positive and punitive engagement operate to influence staff perspective-taking talk could not be examined in the current analyses, and thus we cannot make conclusions on whether positive and punitive engagement have similar influences on staff talk or child development (see Section 5 below for more on this topic).

4.2.4. Activity-relevant questioning

A parallel MLM analysis was conducted to determine what factors predict staff activity-relevant questioning. A similar pattern of results was found. The null model revealed that 68.2% of the variance of this staff behavior was within classrooms, and 31.8% was between classrooms ($ICC = .007/.007 + .015$). In Model 2, proportion of general verbal exchange and subsidy was not significant. The structural variable class size added in Model 3 was also found to be a significant and negative predictor of staff's questioning ($B = -.011$, $SE = .06$), indicating that in larger sized groups, teachers are less likely to engage in activity-relevant questioning behaviors with children. The other structural variables were not significant. In Model 4, a positive interaction style was a significant predictor of staff activity-relevant questioning ($B = .027$, $SE = .006$), but a punitive caregiver interaction style was not significant. Again, it appears that more positive staff are more likely to engage in questioning behaviors about children's activities. In the final model, the addition of these predictors accounted for 13.3% of the within-teacher variance (.015 – .013/.015) and 42.8% of the between-teacher variance (.007 – .004/.007).

5. Discussion

The present study is one of the first to examine caregivers' metacognitive linguistic interactions with children in the child care context. Specifically, the goals of the study were to (1) determine the extent to which teachers engage in the kinds of conversational interactions that are most effective in promoting children's social understanding (i.e., mental-state discourse, discourse about others' perspectives, and activity-relevant questioning), and (2) assess the structural and process indicators of child care quality that may be associated with a more discourse-rich child care context. In addition, the design and methodological advantages of the study (i.e., the use of a multilevel design) allowed us to examine differences in teachers' behaviors both within- and between-classrooms.

5.1. Caregivers' use of metacognitive language with children in child care

In the current sample, the proportion of child care staff's engagement in metacognitive discourse varied among the different types examined. Among the observations of staff's interactions with children, the proportion of staff's mental-state discourse was greater than the proportion of staff's perspective-taking talk and activity-relevant questioning. The finding that caregivers used mental-state terms in 22% of their observed interactions with children is promising. Mothers' mental-state talk with young children in the home is much lower. Jenkins et al. (2003) found that mothers' rates of mental-state talk in naturalistic observations of mother-child conversations ranged from only .55 to 1.32 utterances per hour with their young children, similar to other findings (Bartsch & Wellman, 1995; Dunn, Brown, & Beardsall, 1991). This suggests children in child care are indeed exposed to cognitive utterances, which has been shown to be very important in promoting children's own use of such terms and in their understanding of the link between mental states and behavior (Dunn, Brown, & Beardsall, 1991; Dunn, Brown, Slomkowski, et al., 1991; Jenkins et al., 2003). Child care staff engaged in discourse involving activity-relevant questions in 12% of the snapshots observed in this study. This proportion is similar to findings from Kontos' (1999) study, where teachers' questioning behaviors during their supportive play with children occurred during 18% of their total verbalizations with children. Still, given recent emphasis on the importance of scaffolding children's behaviors in early childhood education (Nyland, 2004), especially to promote social outcomes (Trawick-Smith, 1994), we might expect the proportion of activity-relevant questioning to be higher. Finally, the proportion of perspective-taking discourse was much lower, with only 3% of staff snapshots including talk about perspectives. Such discourse has been shown to foster children's perspective-taking abilities and is crucial for their development of emotional understanding and interpersonal skills (Brown & Dunn, 1996; Dunn, Brown, & Beardsall, 1991; Perlman & Ross, 1997). This is not reflected in staff's behaviors in the current sample.

The higher proportion of mental-state discourse in comparison to the other two types of metacognitive language is of interest. This discrepancy may suggest that there are more opportunities in a child care center for teachers to engage in mental-state talk. For example, storytelling, pretend play, drama, and fantasy are common components of child care activities that all contain an element of cognitive language (Astington & Jenkins, 1995; Dunn, Brown, & Beardsall, 1991). Child care staff's utterances of mental-state terms may be part of the narrative embedded in their activities with children. Conversely, opportunities for questioning and perspective-taking discourse (e.g., in the resolution of children's conflict; Perlman & Ross, 1997) may not present themselves as readily as those for mental-state talk. And, if they do present themselves, caregivers' engagement in these two types of metacognitive discourse may also require more conscious, intentional and effortful action, further decreasing the likelihood that teachers will employ these socialization strategies.

Finally, it is important to consider these findings in light of the fact that teachers were the focus of observation, and not the children. Staff in child care centers direct their behaviors to many more children than parents do at home. Thus, the rates at which individual children are the direct recipients of these behaviors are likely to be very low, especially given the very low rates of some of these behaviors at the staff level. Indeed Layzer, Goodson, and Moss (1993) found that teachers in 119 preschool programs only spent approximately 10% of their time with individual children, despite being actively involved with children 70% of the time. Similarly, Winsler and Carlton (2003) found that even when teachers believe that they are interacting with children one-on-one at least 20% of the time, in reality they do so significantly less, approximately 10% of the time; moreover, the majority of these individualized adult–child interactions (55%) occurred during off-task activities where chances for instructional or high-level teacher talk are lower. Such findings highlight concerns regarding the quantity and quality of teacher-child interactions in early childhood classrooms (Layzer et al., 1993; Wilcox-Herzog & Kontos, 1998; Winsler & Carlton, 2003). For example, Wilcox-Herzog and Kontos (1998) examined teacher talk with the child as the unit of analysis. In their study, they found when teachers were only 3 ft away from an individual target child in early classrooms, the child was still only exposed to high-level teacher talk less than 20% of the time.

The current study also allowed us to examine whether caregivers' proportions of discourse tend to cluster between classrooms. First, the proportion of the variance of mental-state discourse partitioned relatively equally to both the between- and within-classroom levels (45% vs. 55%). This means that classrooms do look differently from one another in terms of the proportion of mental-state talk occurring, and some classrooms generally have higher proportions of mental-state talk compared to others. It also means, however, that there exist differences between individual caregivers' proportions of mental-state talk within the same classroom. Conversely, the proportion of variance of caregivers' activity-relevant questioning between classrooms was substantially lower than within classrooms (31.8% vs. 68.2%). This indicates that, while some classrooms have higher proportions of activity-relevant questioning compared to others, individual staff within classrooms are also very different from each other in terms of this outcome. Finally, the proportion of variance of caregivers' perspective-taking discourse was only significant at the within-classroom level, meaning that caregivers differed within classrooms, but classrooms and centers generally looked similar to each other on this outcome. It is interesting to note that the center-level variances were not significant for all three outcomes, indicating that the center-level means of metacognitive discourse were not different between centers. While individual teachers are different from each other, they may tend to look more similar to each other than to other classrooms' teachers. It is possible that caregivers within classrooms adopt similar styles of interacting and communicating with children, or that aspects of the classroom environment pull for more similar behaviors across teachers. It is also possible that staff with similar interaction styles select to work together.

5.2. *Factors associated with caregivers' metacognitive language in child care*

The structural indicators assessed in the current study included child–staff ratio, group size, and teacher level of formal education. In general, none of these structural indicators were found to be significant predictors of staff's metacognitive language with children in child care. A significant and negative relationship was found between classroom group size and activity-relevant questioning, suggesting staff do engage less in questioning interactions in classrooms with larger groups of children. These nonsignificant findings run counter to our expectations, especially given that these specific structural markers have been associated with children's social outcomes in past research (Howes & Olenick, 1986; Howes & Rubenstein, 1985) and are often used in child care research as proxy measures to overall level of child care quality (LoCasale-Crouch et al., 2007). However, a growing number of recent studies have also failed to find significant effects of these structural child care characteristics on classroom quality and child development (Blau, 2000; Early et al., 2007; LoCasale-Crouch et al., 2007; Phillips et al., 2001). Together, these findings raise questions about the use of structural indicators to predict teachers' socialization practices in the classroom. Instead, individual teacher factors, such as teacher warmth, negativity, or belief system, may play a greater part in determining teacher behaviors.

The process variables of interest in the current study included caregivers' positive and punitive interaction style with children. As expected, staff's positive interaction style was a significant and positive predictor of their engagement in all three types of metacognitive discourse, even after controlling for overall level of general verbal exchange with children and the structural variables of interest. Caregivers who are more positive are more likely to create a conversational environment that is conducive to children's social understanding and growth. This finding is consistent with research that has shown process variables to be stronger, more proximal, predictors of child care quality and child outcomes in child care (NICHD ECCRN, 2002). More specifically, it supports the breadth of research that highlights the important role of caring relationships in child care for children's social and cognitive development (Goldstein, 1999). It has been suggested that positive interactions provide children with a sense of security and attunement with their caregiver, facilitating children's consolidation of linguistically mediated information (Goldstein, 1999; Kienbaum, 2001). Positive interactions seem to be an integral part of the socially mediated process of children's development of an awareness of mind.

Caregivers' punitive interaction style was not a significant predictor of staff's mental-state discourse or activity-relevant questioning, but was a significant and positive predictor of staff's discourse about others' perspectives. That is, those caregivers who have a more punitive interaction style (i.e., controlling, instructing, forbidding) were more likely to engage in perspective-taking talk with children. This finding was unexpected given the aforementioned research on the importance of warm and caring relationships and the finding that positive interaction style also predicts this outcome. It is possible that certain types of negative adult–child interactions pull for perspective-taking discourse, such as interactions that involve

discipline, punishment, and conflict resolution between peers. In other words, such interactions may be more likely to evoke a caregiver's negative or punitive interaction style (as a response to children's behavior) and more discourse about others' perspectives. Still, while both a positive and punitive interaction style may predict talk about perspectives, it is not clear from the current study whether children's outcomes would be similar in both cases. [Dunn and Brown \(1993\)](#) found that it is only mothers' causal talk in the context of positive interactions with children that is associated with children's emotion understanding. Thus, it is likely that a child whose caregiver has a punitive interaction style will not experience the same benefits from perspective-taking talk as a child whose caregiver has a positive interaction style ([Kienbaum, 2001](#)).

Of interest is the finding that the proportion of children receiving subsidized care within a center significantly and negatively predicted staff perspective-taking talk. This result suggests that staff in centers with higher numbers of children from low-income families struggle to engage in perspective-taking talk with these children. Recall that the proportion of children receiving a child care subsidy was included as a control variable in these analyses. It was measured at the center level (i.e., it is an average of all classrooms in the center that serve preschool-aged children), and serves to represent a demographic measure of the socioeconomic bracket of the children served by the centers. We thought it important to include this as a covariate in the analysis because family sociodemographic factors have been linked to child care quality (e.g., [LoCasale-Crouch et al., 2007](#)). Indeed, the current finding is consistent with [LoCasale-Crouch et al's \(2007\)](#) findings that the level of classroom poverty is negatively related to quality of the classroom teaching environment (see also [Phillips et al., 1994](#)). [Phillips et al. \(1994\)](#) also found that teachers in child care centers serving lower-income families were more harsh and less sensitive than teachers serving more advantaged children. There is, however, some ambiguity of the interpretation of the current study's finding given that we only had an aggregate measure of subsidy at the center level, rather than a measure of subsidy or poverty to individual children. There are several possible interpretations of this finding. One is that children from families with lower socioeconomic status are less skilled in their use of language ([Hoff, 2003](#)) or other socioemotional and behavioral indices ([McLoyd, 1998](#)), such that their teachers avoid or have a difficult time engaging in cognitively challenging language such as perspective-taking talk. It is also possible that this effect is really driven by teachers and selection effects. That is, centers in higher income neighborhoods may attract teachers with better training who are more sensitive ([Phillips et al., 1994](#)). Alternatively, teachers from centers serving lower SES neighborhoods may have lower expectations of children's development ([Winfield, 1986](#)), and therefore engage in less metacognitive talk. Clearly, this finding highlights an important area of future research with efforts to corroborate and also differentiate between explanations of this finding by including child-level data.

Despite assessing the influence of a number of important predictors of child care quality, a large portion of the variance in teachers' linguistic practices remains to be explained. In the final models, only between 9.7% and 13.6% of the within-classroom variance, and 11.1% to 42.8% of the between-classroom variance was explained. Teacher practices are obviously complex and it is likely that we have not captured the wide array of experiences that contribute to the variance in teachers' behaviors. For instance, the type and number of activities implemented in the classroom may affect teachers' opportunities to engage in metacognitive discourse. Also, it has been suggested that teachers' personal beliefs and theories of child development, specifically their development of an awareness of mind, influences their practices within the classroom ([Astington & Pelletier, 1996](#); [Kemple et al., 1996](#)). Finally, child effects may play a role. [Kienbaum \(2001\)](#) noted that child gender, inhibition, and aggression all influenced the way in which teachers responded to children's behaviors in a sympathetic, prosocial manner. Thus, individual characteristics of the environment, teachers, children and groups of children should be investigated in future research as possible sources of the variance in teachers' discourse with children.

5.3. Limitations

The sample used in the current study was fairly homogenous, with centers proving to be of somewhat high quality. The mean ECERS-R (a frequently used observational measure of global classroom quality; see [Harms et al. \(1998\)](#) for a description of the measure) score for centers in this study was 5.41 (SD = .64), which is somewhat higher than the national average in Canada, found to be 4.71 ([Doherty, Lero, Goelman, LaGrange, & Tougas, 2000](#)). As a result, we can only speak to teachers' behaviors in higher quality care centers. Another limitation is that we were unable to use an imputation technique to treat the missing data. Thus, listwise deletion was used and as a consequence, 46 out of the 196 staff with observational data were excluded from the analyses. This loss of data may have introduced bias into the sample ([Little & Rubin, 1987](#)). Also, some of the variables expected to predict staff discourse may not have been significant in the current study due to their lack of variability. Finally, the current study did not include any child characteristic or outcome variables, and cannot address the important questions of whether caregivers' metacognitive discourse indeed promotes child development, or whether children's own characteristics pull for specific staff behaviors.

5.4. Future directions and implications

The current study answered several important questions regarding teachers' socialization practices through their interactions with children in child care. With the findings from this study, future researchers will have preliminary information about the extent to which child care teachers' engage in metacognitive language and of the factors that may influence such engagement. The results of this study should be replicated and extended by continuing to investigate the range and extent of socialization practices in the child care environment, to determine factors that may explain variance in these practices, and

to answer process-oriented questions of the effect of teachers' practices on child outcomes. For example, it will be of interest to determine whether teachers' behaviors do in fact relate to children's social-cognitive development and social outcomes in child care, whether they contribute to children's school readiness, and whether any child care effects spillover into the home environment. Also, further topics of interest include investigating the process through which the effects of cognitive talk mediate teacher interactional style and child outcome, and investigating the bidirectional relationship between child or group effects and teacher practices (Kienbaum, 2001).

The current study's findings may also indicate a new direction of research and practice in child care. Child care settings provide invaluable opportunities to implement early support and interventions that support children's early social and social-cognitive development (Raver, 2002). Although more research is needed to replicate and extend on these preliminary findings, this study does suggest that promoting process factors in the child care environment, particularly positive teacher-child relationships, may help facilitate child care socialization practices.

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