

Attachment and caregiver sensitivity in toddler childcare

RELATIONSHIP BUILDING BETWEEN TODDLERS AND NEW CAREGIVERS IN OUT-OF-HOME CHILDCARE: ATTACHMENT SECURITY AND CAREGIVER SENSITIVITY

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Abstract

The aim of this study was to identify factors that help toddlers form attachment relationships with their caregivers during the transition from sole home care to out-of-home childcare.

We investigated relationship building between toddlers and their new caregivers during the first four months in childcare. In a sample of 104 toddlers (aged 10 to 33 months) in 71 Viennese childcare centres, we assessed attachment security (using the Attachment Q-Sort) at three time points. We also assessed children's experiences with their new care providers at each time point, focusing on dyadic caregiver sensitivity (a) during one-to-one interactions with the individual target child, and (b) during interactions with all children in the group. We investigated whether attachment security in the early months of childcare differs between girls and boys, to see if gender, in combination with caregiver interaction, has a role in predicting differences between toddlers' attachment security. Higher attachment security was found in girls, and in those children with caregivers scoring higher on the group-related measure of sensitivity. Dyadic sensitivity did not predict toddlers' attachment security. Findings support the development of attachment/relationship theory, in the context of childcare for young children, that takes account of children's experiences in groups rather than only in one-to-one interactions.

Key words: childcare; transition; quality; attachment relationship; caregiver sensitivity.

Starting childcare and adapting to a new care arrangement can be an unsettling time for young children. Some studies have found that, on entry into childcare, children's levels of behavioural distress increase (Ahnert, Gunnar, Lamb, & Barthel, 2004; Cryer et al., 2005), their levels of stress hormones (cortisol) rise (Ahnert et al., 2004), and their behaviour is inhibited (Fein, Gariboldi, & Boni, 1993; Datler, Ereky-Stevens, Hover-Reisner, & Malmberg, 2012; Datler, Datler, & Funder, 2010; Datler, Ereky, & Strobel, 2001).

The role of caregivers as a source of support is seen to be particularly significant in helping children with the settling-in process. From an attachment theory position, it is argued that young children in childcare need a close adult as a secure base from which to explore their new environment and build relationships with others, including their peers (Howes, Hamilton, & Matheson, 1994a; Howes, Phillips, & Whitebook, 1992; Elfer & Dearnly, 2010; Recchia, 2012). Within this framework, young children in childcare are seen to develop 'secondary' attachment relationships to their new caregivers (Elfer 2006; Bowlby, 2007). Importantly, their level of security within these new attachment relationships can be different from that within their relationships with their primary caregivers (Ahnert, Piquart, & Lamb, 2006; Goossens & Van IJzendoorn, 1990). It is a cause for concern that insecure attachments to care providers have been found to be more common in the context of childcare than in parent-child relationships (Ainslie, 1990; Goossens & Van IJzendoorn, 1990; Sagi et al., 1985, 1995; Ahnert et al., 2006) or in home-based care (Ahnert et al., 2006).

The level of attachment security children develop with their caregivers in childcare has been shown to be related to the child's gender, with girls developing more secure attachment relationships than boys (Ahnert et al., 2004; 2006; De Schipper, Tavecchio, & Van IJzendoorn, 2008). Little is known about the mechanisms driving this difference. Boys have also been found to have less optimal outcomes based on other behavioural measures, within the childcare setting (De Schipper, Tavecchio, Van IJzendoorn, & Van Zeijl, 2004).

Attachment and caregiver sensitivity in toddler childcare

Gender has been explored as a moderator in some studies, with findings suggesting that childcare quality is more strongly related to social and behavioural outcomes in boys than in girls (Broekhuizen, Van Aken, Dubas, Mulder, & Leseman, 2015; Votruba-Drzal, Coley, Maldonado-Carreño, Li-Grining, & Chase-Lansdale, 2010). In the context of gender difference in attachment security within childcare, the role of the quality of caregiving still needs clarification. It is particularly relevant to explore these dynamics when children first enter a new care environment and are in the process of developing attachment relationships with their new caregivers.

The process of forming attachment relationships in childcare settings is seen as similar to the development of infant-mother attachment (Howes, 1999), in which the role of close communication, and the attachment behaviour of the adult directed towards the child, are key; sensitive responsiveness (Schaffer & Emerson, 1964) is at the heart of secure attachments. While this puts the importance of children's individual experiences in one-to-one interactions with their caregivers at the forefront, it is within group situations in childcare that children also come to experience and observe interactions between caregivers and (a) other children and (b) the group as a whole. All of those experiences may impact children's developing relationships with their caregivers. With attachment theory as the guiding framework for early years practice, peer and group interactions are an underexamined aspect of a child's experience in childcare (Datler, Hover-Reisner, & Datler, 2015, Elfer 2006; Rechia & Dvorakova, 2012; Viernickel, 2000;). Importantly, Ahnert et al.'s (2006) meta-analysis showed that the group-oriented sensitivity of care providers, rather than the sensitivity of their responses to individual children, was predictive of caregiver-child attachment security.

In this study, we investigated the relative effects of the quality of caregiver-*individual child* interactions and caregiver-*group* interactions on the development of toddlers'

Attachment and caregiver sensitivity in toddler childcare

attachment security. In doing so, we expand previous research by: 1) including a measure of caregiver sensitivity both during one-to-one interactions with the target child and in group settings; 2) taking those measurements at several time points over the course of children's first four months in childcare, thus focusing specifically on the process of relationship building; and 3) investigating differences between girls' and boys' development of attachment security in childcare and exploring the possible mechanisms that drive those differences.

Relationship Building with Care Providers in Childcare

Research suggests that the quality of attachment to caregivers in childcare can play an important role in children's development, and may have similar functions to attachment relationships with primary caregivers (Howes, 1999; Howes & Hamilton, 1993; Goosen & Van IJzendoorn, 1990; Van IJzendoorn, Sagi, & Lambermoon, 1992). Secure relationships with childcare providers promote children's socio-emotional competence in preschool: securely attached children have been found to have more positive and gregarious peer relationships (Howes & Hamilton, 1993; Howes et al., 1994a), they show more advanced types of play with peers (Howes et al., 1994a; Howes, Matheson, & Hamilton, 1994b; Howes, Rodning, Galluzzo, & Myers, 1988), they are less withdrawn (Howes et al., 1994a), they have a higher level of competent play with adult caregivers (Howes, et al., 1988), and (as measured by their play with objects) they show higher cognitive activity in childcare (Howes & Smith, 1995a).

Despite these findings on the importance of secure relationships in childcare, research that explores relationship-building processes in this context is scarce, and little knowledge exists about how secure attachment relationships are established in the early months of childcare. In the context of infants and their *primary* caregivers, attachment formation is

Attachment and caregiver sensitivity in toddler childcare

usually said to happen over the course of a baby's first year, with infants developing a special preference for a single attachment figure over time, increasingly looking for their primary caregiver for security, comfort and protection, and showing fear of strangers and unhappiness when separated from their special person (Schaffer & Emerson, 1964). The process of forming attachment relationships in childcare settings has been described as similar to the development of infant–mother attachment (Howes, 1999). It has been shown that when children enter new care environments, they direct attachment behaviours to their new caregivers (Barnas & Cummings, 1994; Howes & Hamilton, 1992; Howes & Smith, 1995b), and – over time – can form warm and secure relationships with their caregivers in childcare (Ahnert & Lamb, 2000; Ahnert, Lamb, & Seltenheim, 2000; Howes, Galinsky, & Kontos, 1998; Howes & Smith, 1995a, Lamb & Ahnert, 2006).

In their meta-analysis, Ahnert et al. (2006) found that, among children with continuous care histories, secure child-caregiver attachments were more likely for those children assessed longer after enrolment into childcare ($r=28$, $p=.001$). Therefore, relationship building needs time – infants and caregivers need opportunities to get to know each other. Some researchers have identified that it takes around seven to eight weeks after entry into childcare for changes in infant-caregiver relationships to show (Lee, 2006; Recchia, Sekino, & Brady-Smith, 2000; Sekino, Chen, & Recchia, 2001). Others argue that at least nine months of continuity are needed for a secure relationship to develop (Raikes, 1993).

The level of attachment security children develop with their caregivers in childcare has been found to relate to the child's characteristics. Ahnert et al.'s meta-analysis (2006), a study by Howes and Smith (1995b), and a Dutch study by De Schipper et al. (2008) all found that childcare provider attachment security varied significantly between girls and boys, with girls developing more secure attachments in childcare. Ahnert et al. (2006) speculated that

Attachment and caregiver sensitivity in toddler childcare

girls might form secure attachments to caregivers in childcare more readily because most care providers are female and their 'gender-biased behaviours might lead them to interact more in line with girls' expectations of adequate interactions' (Ahnert et al., 2006, p. 665). Despite a small sample size ($n = 48$), De Schipper et al.'s study (2008) tested this hypothesis and found neither gender differences in the quality of caregiving, nor interaction effects of caregiving and gender on attachment security.

The finding that boys show less attachment security with caregivers than girls do in childcare adds to existing research, which has shown that, if gender differences are identified in children's reactions to childcare, negative effects exist only for boys (Broekhuizen et al., 2015; Crockenberg, 2003; De Schipper et al., 2004). Such findings suggest that, in the context of group care, boys may be more vulnerable than girls (Crockenberg, 2003). Cortisol reactivity has been studied to assess mechanisms that might drive such gender differences in childcare. It has been found that, in boys (but not girls), an increase in cortisol levels relates to more internalising behaviour (Tout, De Haan, Campbell, & Gunnar, 1998). Because internalising behaviours are characterised by social withdrawal and lack of interaction, this result might indicate that stress experienced during transition into childcare might affect boys (more than girls) in terms of how they relate and respond to others including their caregivers. How caregivers are approached by a child will affect the ways in which they in turn respond to and interact with each child. Thus, boys' response to stress and the impact it can have on relationships to caregivers, can offer an explanation for gender differences in child-caregiver attachment.

Attachment Theory in the Context of Group Care for Toddlers

Caregivers in group settings have to distribute their attention amongst a number of children. As a result, individual children experience only limited time in one-to-one

Attachment and caregiver sensitivity in toddler childcare

interactions with their caregivers (Ahnert, Rickert, & Lamb 2000; Datler et al., 2012; Hallam, Fouts, Bargreen, & Caudle, 2009; Kontos, Burchinal, Howes, Wisseh, & Galinsky, 2002; Kontos & Wilcox-Herzog, 1997). Group interaction is the modal interaction in childcare centres: even when care providers are engaged in one-to-one interaction with individuals, they have to pay attention to the rest of the group too (Ahnert et al., 2006). Therefore, in the context of childcare, models of relationships that do not take account of children as part of a group have been criticised as insufficient for understanding young children's complex networks of relationships with adults and peers (Degotardi & Pearsons, 2009; Moss & Penn, 1996; Weisner, 2005).

In light of such criticism, it is important to consider new developments in attachment theory that are driven by research and understanding of young children's development beyond infancy. In their work on a secure-base concept which goes beyond the child's first year, Waters and Cummings (2000) explain that relationship building for young infants relies on experiences during close one-to-one interactions with caregivers, because infants at a very young age have not developed the capacity for symbolic representation, and therefore retain experience with a caregiver in the form of sensorimotor and sensori-affective representations. With increasing capacities for symbolic representation during toddlerhood, however, what can be learned through direct interactions can be expanded by social (observational) learning. Now observations of interactions between different members of a group can emerge as an important influence on secure-base expectations. These ideas are particularly important in the context of group settings for toddlers, and change how we think about their development of attachment. Especially when young children first enter their new environment, and when there is little one-to-one experience with the new caregivers to build upon, children can learn by observing caregivers interacting with other children in the group.

Attachment and caregiver sensitivity in toddler childcare

Through their observations, children can pick up on those aspects of caregiver interactions that are seen to be important for the formation of attachment relationships: the level at which adults respond to children's signals, how successful they are in comforting and helping children, how much autonomy they grant them, how warm and positive they are during their interactions with children, etc. These observations will add to the direct experiences children have with their new caregivers, in shaping children's secure-base expectations. Thus, in the context of group care for toddlers, Waters and Cummings' (2000) thoughts provide us with a framework that explains why one might expect dyadic caregiver sensitivity, both during one-to-one interactions with the individual child, and also in relation to other children in the group, to contribute towards the formation of attachment relationships.

Caregiver Interaction and Caregiver Attachment Security in Childcare

Within the family context, sensitive caregiving has been identified as the strongest determinant of secure attachment (De Wolff & Van IJzendoorn, 1997). This has been applied to caregivers and educators in early childhood settings; early years guidelines emphasise the importance of teacher sensitivity, warmth and responsiveness during interactions, and widely used quality measures are also based on these principles (Ahnert et al., 2006).

Some studies have demonstrated that positive, sensitive and involved caregiving in childcare relates to higher caregiver attachment security (Anderson, Nagle, Roberts, & Smith, 1981; De Schipper et al., 2008; Goosen & Van IJzendoorn, 1990; Howes & Hamilton, 1992; Howes & Smith 1995a, b; Kontos, Howes, Galinsky, & Shin, 1994). Importantly, some of those studies suggested that it was measures which captured the *frequency* of positive caregiving which related to attachment security, while the more qualitative ratings of caregiver sensitivity (e.g. the Observational Record of Caregiving Environment – ORCE;

NICHD Early Child Care Research Network, 1996) were not associated with attachment security (Howes & Hamilton, 1992; Howes & Smith, 1995b; De Schipper et al., 2008).

Thus, when caregivers were more frequently positively involved with children in childcare, children were more securely attached to their caregivers. De Schipper et al. (2008) argued that, in group care settings, where caregivers divide their attention among several children at the same time, only few occasions of sensitive responses to a child's signals may not be enough for a child to develop 'confidence in a caregiver's availability as a safe haven and a secure base' (456).

Observational measurements of caregiver interaction in childcare can be divided into those that capture the classroom experience in general, as it applies to all children in that setting (e.g. Caregiver Interaction Scale, CIS; Arnett, 1989), and those that assess the specific experience of individual children (e.g. ORCE; NICHD Early Child Care Research Network, 1996). Ahnert et al.'s meta-analysis showed that, in the context of group settings, the security of attachments to care providers does not depend on caregiver sensitivity during one-to-one interactions with the individual target child ($r=.04$, $p=ns$), but is associated only with measures of group-related caregiver sensitivity ($r=.15$, $p<.001$) (Ahnert et al., 2006). The direct experience the study child had with his/her care provider, within dyadic interactions in childcare, predicted security of attachment only in small groups and where child-adult ratios were low – maybe because these groups allow for a higher frequency of one-to-one interactions. On the whole however, Ahnert et al.'s study showed that children's relationships with their care providers seemed to be predominantly associated with a measure of group-related sensitivity that takes account of all caregiver interactions – care providers' behaviour towards groups of children, and behaviour directed towards any individual child in the group.

To summarise some of the main points, while it is a common assumption that young children in childcare need a close adult as a secure base from which to explore their new

Attachment and caregiver sensitivity in toddler childcare

environment, and build relationships with others, attachment security in childcare has been found to be relatively low, particularly for boys. Little is known about the formation of attachment security in childcare. In an earlier study (Datler et al., 2012), we showed that children's levels of involvement with others can be low during the early months of childcare, suggesting that settling into childcare can take time. More needs to be known about relationship building processes during this phase. Especially when first entering their new environment, when there is little one-to-one experience with the new caregivers to build upon, one may expect caregivers' group-related sensitivity to be an important facilitator of children's developing attachment security. And, since low levels of attachment security have been found in boys in childcare, it is particularly relevant to consider gender differences whilst exploring these interactions.

Study Aims and Research Questions

The aim of this study was to identify factors that help toddlers form attachment relationships with their caregivers during the transition from sole home to out-of-home childcare. Based on the assumption that the security of relationship to the new caregiver is an important facilitator of the settling-in process, we measured attachment security at three time points over the course of toddlers' first four months in childcare. At each time point, we assessed associations between children's attachment security and their experiences with their caregivers, focusing on caregiver sensitivity during dyadic interactions, both with the individual target child, and also in group situations. We also investigated whether attachment security in the early months of childcare differs between girls and boys. Thus, we explored whether gender, in combination with caregiver interaction, has a role in predicting differences in toddlers' attachment security.

Research questions are:

1. How does toddlers' attachment security with new caregivers develop and change during the first four months in childcare?
2. Do levels of, and changes in, attachment security differ according to the child's gender?
3. What is the relationship between the quality of caregivers' group-related sensitivity and children's attachment security?
4. What is the relationship between the quality of caregivers' dyadic sensitivity to the individual child and attachment security?
5. Does the child's gender moderate associations between caregiver interactions and attachment security?

Method

Sample

The study was carried out in Vienna – the region of Austria with the largest up-take of childcare for infants and toddlers (26.8% of under two-year-olds in 2009). A total of 104 children attending 71 childcare centres (84 childcare groups) in socio-economically diverse areas of Vienna were involved in the study. 49% of children were cared for in state-run centres, the others attended private centres (16.3% toddlers in Catholic centres, 11.5% in parent organised groups, and 23.1% in mixed age groups). Group sizes in the centres ranged from 10-23 ($M = 16.06$; $SD = .31$), with a child-caregiver ratio between 2.5-10.5 (mean: 5.4). In some centres ($n = 22$) more than one target child participated in the study. In total, 31 children shared a childcare group with other target children, and seven of those children

Attachment and caregiver sensitivity in toddler childcare

attended the same childcare group in the centre but were sampled in different data collection years. The number of target children sharing a childcare group ranged from two to four.

Children's age at the first data collection time in childcare ranged from 10-35 months with a mean around the age of two (Mean: 23.63, SD: 4.71). The majority of children in the sample were between 2-2.5 years of age at this time point (78.84%), and only few children were under the age of 18 months (11.54%) or over the age of 2.5 years (9.62%). 54.8% of the children were female. Children in this study were primarily from white middle class families, and before enrolment to childcare, all toddlers were cared for at home, primarily by their parents. In all families, at least one parent spoke German (see Datler et al., 2012).

Overview of Procedures

Data for this study is drawn from a larger study. Data collection took place between 2007 and 2009 (3 waves). The study design was longitudinal, and data collection was carried out in the home environment as well as the childcare setting. For the qualitative part of the study, observations were carried out on a weekly basis (see Datler et al., 2010). For the data collected for quantitative analysis (see Datler et al., 2012), visits took place at several time-points throughout the child's first year in childcare: home visits, carried out 2 weeks before entry to centre care, and again after 6 months; visits in the child's care setting, carried out in the first 2 weeks the toddler was left in the centre without the parent's presence, and after 2, 4, and 6 months in the setting. A separate half-day visit was carried out in each childcare centre to assess the general quality of the setting. Questionnaire data on child behaviour was collected after one year. All research was conducted in accordance with APA ethical standards in the treatment of the study sample.

Analysis reported here refers to data collected during the first 3 visits to the child's care setting – within the first 2 weeks the toddler was left in the centre without the parent's

Attachment and caregiver sensitivity in toddler childcare

presence (Time [T] 1), and after 2 (T2), and 4 (T3) months in child care. At each time point, a trained researcher spent the morning in the childcare setting to carry out interviews, hand out questionnaires, and to conduct child and caregiver observations over a period of 3 hours. In addition to these live-observations, a continuous hour of observation was video-taped at each time-point, with the target child as the focus point.

Measures

Child-caregiver attachment security. Children's attachment relationships to their key care providers in childcare were observed during the fieldwork visits at T1, T2, and T3.

Observations lasted 3 hours, and were coded using the Attachment Q-Set (AQS; Waters, 1995), which provide a characterisation of children's secure-base behaviour. The AQS consists of 90 cards. On each card, a specific behavioural characteristic of children between 12 and 48 months of age is described, with special emphasis on secure-base behaviour (Vaughn & Waters, 1990). Based on several hours of live-observations, the observer ranks the cards into several piles, from 'most descriptive of the subject' to 'least descriptive of the subject'. The number of piles and the number of cards that can be put in each pile are fixed. The resulting Q sort – the 'profile' of the child – gets correlated with the 'expert sort' describing the prototypically secure child (a profile provided by several experts in the field of attachment theory). The resulting AQS scores can range from -1.0 to +1.0, from a perfect negative correlation to a perfect positive correlation with the ideal-type security sort. Higher scores indicate more similarity to the ideal-type security sort, thus higher attachment security. Originally, no cut-off point was suggested dividing secure from insecure children. However, some studies have suggested such a 'threshold level', and converted the continuous AQS scores into a categorical variable, with children categorised as securely attached if their AQS

Attachment and caregiver sensitivity in toddler childcare

scores is above .33, and as insecurely attached if their AQS value is below .33 (Ahnert et al., 2006; Howes et al., 1988).

Across the three time points (T1-T3), 32 observation visits (10.26%) were carried out by two trained researchers who separately coded the AQS. Good inter-rater agreement was achieved (Spearman's $Rho = .767$).

Group-related sensitivity. The quality of caregiver sensitivity when interacting with all of the children in the classroom was rated at each fieldwork visit (T1, T2, T3), by scoring the German version of the Caregiver Interaction Scale (CIS; Arnett, 1989; described in Ahnert et al., 2000). Caregiver behaviours are rated on 31 items (5-point scale; e.g. pays positive attention to the children as individuals; spends considerable time in interactions not involving the children). The dimensions of caregiver behaviours in focus are: sensitivity (the extent to which care providers attend to and encourage individual infants), punitiveness (the importance placed on obedience in the group), dedication (the extent to which care providers captured infants' interest and were involved in their activities), and permissiveness (the extent to which the care providers limited the infants' activities [reverse-scored]).

Across the three time points (T1-T3), 33 observation visits (10.58%) were carried out by two trained researchers who separately coded the CIS. Good inter-rater agreement was achieved (Spearman's $Rho = .759$). Preliminary confirmatory factor analysis suggested that a quality construct consisting of the original four CIS measures at each time-point did not fit data well ($\chi^2_{[39]} = 159.25$; $p < .001$; CFI = .739; RMSEA = 0.172; SRMR = 0.110). A model in which we dropped the "permissiveness" scale retaining sensitivity (warm, attentive, and engaged), (lack of) harshness (critical, threatens children, and punitive) and (lack of) detachment (low levels of interaction, interest, and supervision) fit data well ($\chi^2_{[19]} = 15.625$; $p = .68$; CFI = 1.000; RMSEA = 0.000; SRMR = 0.054).

Dyadic sensitivity. The quality of caregiver sensitivity between the caregiver the centre had assigned as the child's key care provider and the individual target child was measured by rating the one-hour video-observations carried out in childcare during the mornings at each of the 3 time points (T1, T2, T3). We used the ORCE (Observational Record of the Caregiving Environment; NICHD Early Childcare Research Network, 1991) as the basis for our rating scale manual. For each hour, global judgements on four qualitative variables were made on a scale from 1-5.

Positive affect/warmth assesses the extent at which caregivers express joy, warmth, patience, and fondness towards the target child. At the low end, caregivers display little signs of positivity and attentiveness towards the target child, with an absence (or only few signs of) of smiling or positive touching, cold or distant tone of voice, and no playful interactions with the child. On the high end, caregivers smile at and laugh with the child, address the child in a warm voice, show physical signs of affection (hugging, holding, stroking), and join playful interactions.

Stimulation of exploration and participation measures the extent to which caregivers engage with the child to foster the target child's involvement. At the low end, caregivers don't try to direct the child's attention to materials, activities and/or peers in the group. This is indicated by lack of talk about objects and peers, no invitations to the child to join activities, and lack of joint attention where the target child observes and engages with the environment. At the high end, caregivers stimulate child engagement throughout the observation. They offer activities, respond to the child's focus of attention, join in and facilitate play, exploration and interactions with others.

Sensitivity to non-distress captures appropriate responsiveness to the target child in situations where the child is happy and/or content. At the low end, caregivers, demonstrate lack of awareness or indifference to the child's signals. Signs by the child are not responded

Attachment and caregiver sensitivity in toddler childcare

to or responses are ‘out-of-synch’. At the high end, caregivers seem emotionally and behaviourally attuned – the child’s signals are responded to at a level that meets the child’s interest, emotions, needs and abilities.

Sensitivity to distress captures caregiver responsiveness to the child’s signs of unhappiness and/or stress. At the low end, caregivers do not respond to the child’s signals. They do not try to calm the child down and provide reassurance. Where there are responses, they are delayed and/or half-hearted. At the high end, caregivers respond promptly, and take time to comfort and calm down the child. They offer physical closeness, and verbal reassurance (Ereky-Stevens, Fürstaller, & Funder, 2008). Ratings for each caregiver were performed by a separate coder for each of the time points. Coders were blind to the child’s ratings at other time points and to child data otherwise collected for the project. To test inter-rater agreement, one-hour video-recordings were double coded and correlations were carried out. Inter-rater agreement between each researcher and the golden standard was high with a mean Spearman rho .772 across 24 double-coded observations.

An initial CFA in which we specified all four indicators of the observation measure did not converge, possibly due to a large number of missing observations on the fourth indicator. We thus dropped the “sensitivity to distress” indicator, retaining the other three: positive affect/warmth, stimulation of exploration and participation, and sensitivity to non-distress. This model fit data well ($\chi^2_{[19]} = 19.75$; $p = .41$; CFI = .998; RMSEA = 0.020; SRMR = 0.052).

Analytic Strategy

In order to investigate the level and change in secure attachment during the first four months in childcare, we observed the descriptives and specified a latent growth curve model (LGC). In order to interpret the intercept at onset and the change over months, we set the

latent slope (change) parameters to 0, 2 and 4. We included gender as a predictor to investigate effects of gender on the level and change of attachment security (research question 2), and by carrying out a two-group (boys versus girls) growth model.

In order to answer research questions three and four on associations between children's attachment scores and their caregivers' dyadic and group-related sensitivity, we added time-varying covariates of the indicators of the growth model (i.e., attachment security). Within each time point we regressed secure attachment on the group-related measure of sensitivity (i.e., the CIS) and the dyadic level. We allowed both measures of interaction to be correlated within each time point. We investigated the moderation effects of gender (research question five) by two-group path models using gender as a moderator (grouping variable).

Missing data was negligible (1.6%) so we applied the default Full Information Maximum Likelihood (FIML) procedure in MPlus. We used the robust maximum likelihood estimator (MLR) to adjust standard errors for any non-normalities in the variables.

We considered the nested structure of the data in three ways, concluding it was not necessary to account for in the models. First, no intraclass correlations were significant. Second, only 17 out of the 84 centers contributed to random effects. Third, results from models which accounted for the nested structure using the Complex command in Mplus (Muthén & Muthén, 2012) were not different from the findings reported below.

Results

We first observed the descriptives ($M_{T1} = .27$, $SD_{T1} = .17$; $M_{T2} = .25$, $SD_{T2} = .15$; $M_{T3} = .26$, $SD_{T3} = .18$). The proportion of children at each time who scored above the threshold value for secure attachment (threshold = 0.33) were 39 (37.5%), 33 (31.7%) and 35 (33.7%) at the three respective time-points. As shown in Table 2, girls were more securely attached

Attachment and caregiver sensitivity in toddler childcare

than boys at each time-point ($p = <.05$). The number of securely attached children at T1 were 11 boys and 28 girls ($\chi^2_{[1]} = 7.25$; $p < .01$, $n=39$), at T2 7 boys and 26 girls ($\chi^2_{[1]} = 11.22$; $p < .01$; $n=33$), and at T3 11 boys and 24 girls ($\chi^2_{[1]} = 3.755$; $p = 0.053$, $n=35$). Child age did not significantly correlate with children's attachment scores ($r = -0.04, -0.03, -0.11$ at the three respective time-points) (Table 1).

To answer the first research question about level and change in secure attachment over time, we specified a LGC model. The model fit data well ($\chi^2_{[1]} = 0.263$; $p = .61$; CFI = 1.000; RMSEA = 0.000; SRMR = 0.012; see Figure 1). The average attachment at onset was $M = 0.26$. The average slope indicated no change on average in the sample ($M = 0.000$). There were significant individual differences in individual intercepts ($\sigma^2 = .016$; $p < .001$) and slopes ($\sigma^2 = .002$; $p < .001$). Visual inspection of individual trajectories showed stable, increasing and decreasing secure attachment over time (Figure 2). The association between onset and change in secure attachment was $r = -.68$. This means the higher the onset of attachment was the less the child increased in attachment over time, or the lower the onset of attachment the more the child increased in attachment over time.

Next, to answer the second research question, we included gender as a predictor of both onset and change in secure attachment in the LGC model (Figure 1). This model also fit data well ($\chi^2_{[2]} = 0.704$; $p = .70$; CFI = 1.000; RMSEA = 0.000; SRMR = 0.021). Girls had a significantly higher attachment security onset than boys ($B = 0.089$; $p < .01$), but no effect of gender on the slope was found ($B = -0.004$; $p = .76$). We also carried out a two-group growth model (i.e., boys vs. girls). This model fit data well ($\chi^2_{[2]} = 0.748$; $p = .69$; CFI = 1.000; RMSEA = 0.000; SRMR = 0.023). Boys had a lower onset level of secure attachment than girls (see Figure 1). There was no significant change for boys or girls. For girls, individual differences in onset attachment was found (although $p = .052$) and significant individual differences in change in attachment security over time ($\sigma^2 = .004$; $p < .01$). Inspection of

estimated trajectories (see middle panel in Figure 2) suggested a fanning-out pattern for boys (although this did not reach significance), while for girls a higher onset was related to decreased attachment security over time, while a lower onset attachment security was related to a larger increase in attachment security over time (correlation between level and change was $-.79, p < .001$).

To answer the third and fourth research questions, we added time-varying covariates to the growth model as shown in Figure 3 ($\chi^2_{[13]} = 9.17; p = .76; CFI = .945; RMSEA = 0.053; SRMR = 0.034$)ⁱ. Neither group-related nor dyadic measures of sensitivity were stable over time. Secure attachment was predicted by the quality of group-related sensitivity (CIS) at all three time points: $\beta = .26$ ($p < .001$) at onset, $\beta = .34$ ($p < .001$) at time 2 and $\beta = .38$ ($p < .001$) at time 3. Measures of group-related and dyadic sensitivity were associated (time 1: $r = .20, p < .05$; time 2: $r = .23, p < .05$; time 3: $r = .28, p < .01$).

Finally, we investigated whether gender moderated the associations between attachment security, and quality of dyadic and group-related sensitivity. The model fit data less well ($\chi^2_{[30]} = 36.32; p = .20; CFI = .887; RMSEA = 0.064; SRMR = 0.068$). None of the paths were significantly different for boys and girls.

Discussion

The main aims of this study were, first, to investigate levels of, and changes in, toddlers' attachment security with their new caregivers during the first four months in a new childcare environment, and to explore gender differences; and, second, to assess the relationship between caregivers' dyadic sensitivity – both one-to-one and group-related – with toddlers' attachment security, and whether gender moderates associations between sensitivity and attachment security. We have replicated the finding of Ahnert et al.'s (2006) meta-analysis that (1) attachment security with caregivers in childcare is relatively low, (2)

girls are more securely attached to their care providers than boys, and (3) group-related, rather than dyadic sensitivity predicted attachment security. We have gone beyond previous studies in exploring levels of, and changes in, attachment security at several time points throughout toddlers' settling-in period (the first four months) in childcare, and including at the same time points dyadic *and* group-related measures of sensitivity.

The results of this study yield important insights into relationship building between young toddlers and new caregivers in childcare, in the early months of settling into their new environment. Descriptive analysis showed that, on average, children's attachment security was low, and did not increase over the course of the first four months in childcare. The proportion of children who scored above the threshold value for secure attachment was between 30% and 40% at each of the three time points. In other words, throughout the first four months in childcare, the majority of toddlers in our sample were classified as insecurely attached. In comparison, the rates of insecure attachment between parents and children that have been reported across a range of cultural contexts is around one third (Ahnert et al., 2006). The relatively low level of attachment security with caregivers in childcare that we found is in line with previous research. Ahnert et al.'s meta-analysis (2006) reported that (in a sample of 2,626) 39.8% of children were securely attached to non-parental care providers in centre-based childcare. And in a sample of 712 under-threes, Howes and Smith (1995b) also classified only 40% as securely attached.

Our study showed that, on average, attachment security did not increase over the course of the first four months in childcare. While it has been suggested previously (Raikes, 1993), that it takes at least nine months of continuity for secure attachment relations to develop, relatively little is known about the process of forming secure caregiver-child attachments in childcare. Comparisons with the development of attachment relationships between parents and children are difficult, because in families bonding happens right from

the beginning and develops throughout the first year, a developmental stage distinct in many ways from toddlerhood.

One reason why attachment scores with caregivers could be relatively low over a period of some months after entry into childcare may be that, compared with relationships in families, group dynamics in childcare may be more unstable, especially during a period when many children in the group are settling into the new environment at the same time. This hypothesis will need further investigation. Ahnert et al.'s meta-analysis (2006) is relevant here, as it showed that, only for children with stable childcare arrangements, time post entry was positively associated with the security of attachment to care providers ($r=28$, $p<.001$). In our study, childcare arrangements and observed caregivers stayed the same, yet caregiver sensitivity was not significantly related across the measurement points at T1, T2 and T3. This was true for both measures: sensitivity towards the target child and sensitivity towards the group of children. Importantly, growth curve modelling applied in this study enabled us to observe changes on an individual child level. While we had found that, on average in the group, attachment scores did not increase over time, on an individual child level we saw significant changes in attachment-related behaviour across the three time points. Varying levels of increase and decrease, as well as linearity in attachment scores were observed between the individual children in our sample. Similar findings on individual patterns of change emerged previously in this study (Datler et al., 2012) with other measures of child behaviour (mood, explorative interest and levels of reciprocal exchanges with caregivers and peers). Overall, the level of instability in interaction and relationship measures across the first four months of childcare is reason for concern. To help our understanding of young children's settling-in processes, further investigation is required into relationship building with caregivers beyond the early months in childcare, and also into the stability of group dynamics when children first settle in compared with later time points.

This study confirms that gender plays an important role in children's settling-in processes. Gender predicted differences in levels of attachment security: at each time point, girls had, on average, higher attachment security, and a higher proportion of girls were classified as securely attached to their new caregivers. Inspections of trajectories suggested that for girls, lower levels of attachment security on entry into childcare related to a greater increase of attachment security, while a higher attachment security on entry was related to decrease over time. For boys, a fanning-out pattern was observed. While this was not significant, we saw clear gender differences in individual patterns of change in attachment security over time. Importantly, in our study we found that those gender differences were specific to secure-base behaviour – no gender differences had been found in other areas of child behaviour (child mood, explorative interest and levels of reciprocal exchanges) in an earlier analysis (Datler et al., 2012). Here, we explored whether gender differences in secure-base behaviour could be explained by our measures of caregiver interactions. Associations between interaction quality and levels of attachment security were not significantly different for boys and girls, and only one of six measures of interaction quality differed significantly, with girls experiencing higher quality of one-to-one interaction on entry into childcare than boys. Therefore, this study does not produce clear evidence that differences in attachment security can be explained by experiences with caregivers, or the different ways in which these experiences influence toddlers' relationship security.

This study replicated previous research findings in that caregiver sensitivity during one-to-one interactions with target children did not relate to toddlers' levels of attachment security with their caregivers in group care. This is not to say that one-to-one interactions do not matter. Previous research indicates that experiences during one-to-one exchanges with caregivers in childcare can contribute to children's formation of attachment relationships if children experience sufficiently high levels of one-to-one interactions (Ahnert et al., 2006;

DeSchipper et al., 2008). In our sample, levels of reciprocal one-to-one exchanges between caregivers and children were found to be low across all three measurement points (Datler et al., 2012). Consequently, it could be argued that caregivers need to ensure that enough time is spent in one-to-one interactions. This is an important consideration, especially in light of the vast amount of previous research that highlights the importance of one-to-one interactions for young children's wellbeing and development.

Nevertheless, in group care, group interactions are the modal form of interactions (Ahnert et al., 2006). Group processes are an undervalued and under-investigated area of childcare research. In this context, the most important finding of this study is that sensitivity of caregivers' interactions with all children in the group related to toddlers' levels of attachment security at each measurement-point. These findings are in tune with previous findings (Ahnert et al., 2006) and further emphasise the need to put more attention on group processes. Thus, most importantly, this study added evidence that confirmed the importance of group-related measures of caregiver sensitivity in the context of childcare. Because the importance of caregiver sensitivity to the group of children was found in relation to secure-base behaviour, this study also emphasises the need to take account of developments in attachment theory (Waters and Cummings 2000) that move beyond the sole focus on close one-to-one interactions as the basis for attachment formation.

This study must be interpreted with regards to its limitations, one of which is that different approaches were used in measuring of group-related and dyadic sensitivity. Group-related sensitivity was measured during real-live observations over the course of one morning with the group (at each measurement point). Dyadic sensitivity was observed via video-taped 'child-focused' observations, which lasted an hour at each measurement point. Considering the low levels of reciprocal exchanges between caregivers and children previously found in this sample (Datler et al., 2012), a strong measurement of sensitivity during dyadic

interactions may have required longer observation periods. In addition, the comparability of video observations and live classroom observations remains unclear.

A second limitation relates to the age range of the children taking part in the study. Children in our sample were at different developmental stages, with the youngest child still in its infancy on entering childcare (10 months), and the oldest approaching nearly three years of age (33 months). With only 10% of our sample in the age group of under 18 months, interpretation of behaviours measured by the Q-Sort may be skewed.

A third limitation lies in the fact that this research took place in a culture with generous maternity regulations, where toddlers start childcare comparably late, and where childcare centres generally are of relatively high quality. Moreover, results were obtained in centres serving middle-class populations. Therefore, findings may not pertain to other cultures or countries, to lower-quality centres or to centres serving other social classes.

In this paper, we did not further explore the possibility, that a child's first relationship with parents might affect the development of subsequent relationships with new caregivers in child care. It would be interesting in particular to investigate if attachment security to primary caregivers facilitates the development of secure attachment relationships to new caregivers in child care, or if insecure attachment relationships to primary caregivers increases toddler's vulnerability in the context of parental separation through attendance of group care.

A final limitation relates to our findings on gender difference. While we did not find that caregiver sensitivity varied between boys and girls, or that gender moderated associations between sensitivity and attachment security, this study cannot eliminate the possibility that other unmeasured aspects of caregiver interaction might be gender biased and lead to those gender differences identified in our study. Further work is needed to look more closely into the mechanisms behind gender differences in attachment in childcare. Future study should also address the question of whether (or in which way) boys' lesser attachment

Attachment and caregiver sensitivity in toddler childcare

security with new caregivers during the early months of childcare affects their settling-in processes, as well as their experiences and relationships in childcare at a later stage. It has been argued that a child's first relationship with care providers in childcare might provide a working model for subsequent relationships with teachers, setting the stage for later adjustment, development and learning in educational settings (Lee, 2006). In light of these propositions, and the suggestion that, in the context of group care, boys may be more vulnerable than girls, there is a significant need for further investigation into gender in the context of childcare entry.

Most importantly, further work is needed in developing measures which capture the quality of group-related interactions in childcare. In this study, the CIS (Arnett, 1989) was used to capture the sensitivity of caregivers' behaviour when interacting with all of the children in this group, and was used to predict attachment security. Its results may be interpreted in two ways. One interpretation is that the CIS captured the quality of interactions that the child was not directly involved in: interactions with other children in the group, which the child may have observed. In this case, children's observations of caregivers interacting with other children in the group would emerge as an important influence on secure-base expectations. This is important to consider, since it relates to how we understand attachment formation at toddler age in childcare (Water and Cummings, 2000). Another interpretation is that the CIS measure may have captured the quality of group-related caregiver interactions, particularly those that promote group processes and thus facilitate feelings of belongingness and security within the group. This may be particularly relevant to children's settling-in processes, and highlights a need for measures that specifically capture caregivers' ways of relating to groups of children. Future research will need to employ measures of interaction quality that distinguish more clearly between i) the target child's direct experiences during one-to-one interactions with caregivers, ii) the child's experiences

of caregiver interactions with other children in the group that they observe second-hand; and
 iii) caregivers' interaction strategies directed at the group of children, in particular those that support group processes (Van Schaik, Leseman, & Huijbregts, 2014).

Conclusion

This study significantly adds to our knowledge of young children's relationship building with new caregivers in childcare. It strengthens claims that, in the context of group care, sensitive and responsive interactions from caregivers facilitate toddlers' security in developing relationships with them. Yet, in line with previous research, it appears that the security of relationships with caregivers in childcare is not (or at least not mainly) affected by experiences during one-to-one interactions. In the family context, these have been found to be the most important determinant of parent-child attachment security (De Wolff & Van Ijzendoorn, 1997). In the group context, however, experiences of the ways in which caregivers interact with all children in the group contribute significantly towards toddlers' developing sense of confidence in the availability of the new caregivers as a secure base. Findings suggest that group dynamics in classrooms with young children, and group-focused sensitivity, are highly relevant to children's experiences in childcare. This has important implications for practice: Time for individual one-to-one interactions is limited in group-care, and developing close relationships with a child might take time. However, the way in which caregivers respond to *all* children in the group can support toddlers' developing sense of security in their new environment during their transition to out-of-home childcare.

References

- Ahnert, L., & Lamb, M. E. (2000). Infant-care provider attachments in contrasting child care settings II: Individual-oriented care after German reunification. *Infant Behaviour & Development, 23*, 211-222. doi:10.1016/S0163-6383(01)00042-X
- Ahnert, L., Lamb, M. E., & Seltenheim, K. (2000). Infant-care provider attachments in contrasting child care settings I: Group-oriented care before German reunification. *Infant Behaviour & Development, 23*, 197-209. doi:10.1016/S0163-6383(01)00036-4
- Ahnert, L., Gunnar, M. R., Lamb, M. E., & Barthel, M. (2004). Transition to childcare: Associations with infant–mother attachment, infant negative emotion, and cortisol elevations. *Child Development, 75*, 639–650. doi: 10.1111/j.1467-8624.2004.00698.x
- Ahnert, L., Pinquart, M., & Lamb, M. E. (2006). Security of children's relationships with nonparental care providers: A meta-analysis. *Child Development, 77*, 664-679. doi: 10.1111/j.1467-8624.2006.00896.x
- Ahnert, L., Rickert, H., & Lamb, M. E. (2000). Shared caregiving: Comparisons between home and child-care settings. *Developmental Psychology, 36*, 339-351. Doi: 10.1037/0012-1649.36.3.339
- Ainslie, R. C. (1990). Family and center contributions to the adjustment of infants in full-time day care. *New Directions for Child Development, 49*, 39–52. doi: 10.1002/cd.23219904905
- Anderson, C. W., Nagle, R. J., Roberts, W. A., & Smith, J. W. (1981). Attachment to Substitute Caregivers as a Function of Center Quality and Caregiver Involvement. *Child Development, 52*, 53-61. doi: 10.2307/1129214
- Arnett, J. (1989). Caregivers in day care centers : Does training matter? *Journal of Applied Developmental Psychology, 10*, 541-552. doi:10.1016/0193-3973(89)90026-9

Attachment and caregiver sensitivity in toddler childcare

- Barnas, M. V., & Cummings, E. M. (1994). Caregiver stability and toddlers' attachment-related behavior towards caregivers in daycare. *Infant Behavior and Development*, 17, 141–147. doi:10.1016/0163-6383(94)90049-3
- Bowlby, R. (2007). Babies and toddlers in non-parental daycare can avoid stress and anxiety if they develop a lasting secondary attachment bond with one carer who is consistently accessible to them. *Attachment and Human Development*, 9, 307-319. doi: 10.1080/14616730701711516
- Broekhuizen, M. L., van Aken, M. A. G., Dubas, J. S., Mulder, H., & Leseman, P. P. M. (2015). Individual differences in effects of child care quality: The role of child affective self-regulation and gender. *Infant Behavior and Development*, 40, 216-230. doi:10.1016/j.infbeh.2015.06.009
- Cryer, D., Wagner-Moore, L., Burchinal, M., Yazejian, N., Hurwitz, S., & Wolery, M. (2005). Effects of transitions to new child care classes on infant/toddler distress and behaviour. *Early Childhood Research Quarterly*, 20, 37–56. doi:10.1016/j.ecresq.2005.01.005
- Crockenberg, S. (2003). Rescuing the baby from the bathwater: How gender and temperament (may) influence how child care affects child development. *Child Development*, 74, 1034-1038. doi:10.1111/1467-8624.00585
- Datler, W., Ereky-Stevens, K., Hover-Reisner, N., & Malmberg, L. E. (2012). Toddlers' transition to out-of-home day care: Settling into a new care environment. *Infant Behaviour and Development*, 35, 439–451. doi: 10.1016/j.infbeh.2012.02.007
- Datler, W., Datler, M., & Funder, A. (2010). Struggling against a feeling of becoming lost: A young boy's painful transition to day care. *Infant Observation*, 13, 65–87. doi:10.1080/13698031003606659

- Datler, W., Ereky, K., & Strobel, K. (2001). Alleine unter Fremden. Zur Bedeutung des Trennungserlebens von Kleinkindern in Kinderkrippen. In W. Datler, A. Eggert-Schmid Noerr, & L. Winterhager-Schmid (Eds.), *Das selbständige Kind. Jahrbuch für Psychoanalytische Pädagogik 12* (pp. 53–77). Gießen: Psychosozial-Verlag.
- Datler, W., Hover-Reisner, N. & Datler, M. (2015). Toddlers' relationships to peers in the processes of separation: from the discussion of observational accounts to the development of theory. *Infant Observation. The International Journal of Infant Observation and Its Applications*, 18, 14-35. doi:10.1080/13698036.2015.1030188
- Degotardi, S, Pearson, E. (2009). Relationship theory in the nursery: Attachment and beyond. *Contemporary Issues in Early Childhood*, 10, 144-155. doi: 10.2304/ciec.2009.10.2.144
- De Schipper, J. C., Tavecchio, L. W. C., van IJzendoorn, M. H., & van Zeijl, J. (2004). Goodness-of-fit in center day care: Relations of temperament, stability and quality of care with the child's problem behavior and well-being in day care. *Early Childhood Research Quarterly*, 19, 257–272. doi: 10.1016/j.ecrq.2004.04.004
- De Schipper, J.C., Tavecchio, L.W.C., & van IJzendoorn, M.H. (2008). Children's attachment relationships with daycare caregivers: Associations with positive caregiving and the child's temperament. *Social Development*, 17, 454-470. doi: 10.1111/j.1467-9507.2007.00448.x
- De Wolff, M.,S., & Van IJzendoorn, M.H. (1997). Sensitivity and attachment: a meta-analysis on parental antecedents of infant attachment. *Child Development*, 68, 571-591. doi: 10.1111/j.1467-8624.1997.tb04218.x
- Elfer, P. (2006). Exploring children's expressions of attachment in nursery. *European Early Childhood Education Research Journal*, 14, 129-141. doi: <http://dx.doi.org/10.1080/13502930285209931>

- Elfer, P., & Dearnley, K. (2010). Facilitating intimacy between nursery staff and children under three. *Infant Mental Health Journal*, 31, 128-128.
- Ereky-Stevens, K., Fürstaller, M., & Funder, A. (2008): *Toddlers' Transition Process Scale (TPS). A Manual for the Rating of the Process of Toddlers' Transition to Out-of-Home Day Care. German Version I*. Unpublished manuscript, Vienna, Austria.
- Fein, G. G., Gariboldi, A., & Boni, R. (1993). The adjustment of infants and toddlers to group care: The first 6 months. *Early Childhood Research Quarterly*, 8, 1-4.
doi:10.1016/S0885-2006(05)80095-
- Goosen, F.A., & Van IJzendoorn, M. (1990). Quality of infant's attachments to professional caregivers: Relation to infant-parent attachment and day-care characteristics. *Child Development*, 61, 832-837. doi: 10.2307/1130967
- Hallam, R., Fouts, H., Bargreen, K., & Caudle, L. (2009). Quality from a toddlers' perspective: A bottom-up examination of classroom experiences. *Early Childhood Research & Practice*, 11, retrieved from https://archive.org/details/ERIC_EJ868534
- Howes, C. (1999). Attachment relationships in the context of multiple caregivers: Mothers and child care teachers. In J. Cassidy, P. R. Shaver, & Phillip R. (Eds), *Handbook of attachment: Theory, research, and clinical applications* (pp. 671-687). New York, US: Guilford Press.
- Howes, C., & Hamilton, C. E. (1992). Children's relationships with caregivers: Mothers and child care teachers. *Child Development*, 63, 859-878. doi: 10.2307/1131238
- Howes, C., & Hamilton, C. E. (1993). The changing experience of child care: Changes in teachers and in teacher-child relationships and children's social competence with peers. *Early Childhood Research Quarterly*, 8, 15-32. doi:10.1016/S0885-2006(05)80096-1

Attachment and caregiver sensitivity in toddler childcare

- Howes, C., Hamilton, C.E., & Matheson, C.C. (1994a). Children's relationships with peers: Differential associations with aspects of the teacher-child relationship. *Child Development, 65*, 253–263. doi: 10.1111/j.1467-8624.1994.tb00748.x
- Howes, C., Galinsky, E., & Kontos, S. (1998). Child care caregiver sensitivity and attachment. *Social Development, 7*, 25-36. doi: 10.1111/1467-9507.00048
- Howes, C., Matheson, C.C., & Hamilton, C.E. (1994b). Maternal, teacher and child care history correlates of children's relationships with peers. *Child Development, 65*, 264–273. doi: 10.1111/j.1467-8624.1994.tb00749.x
- Howes, C., Phillips, D. A., & Whitebook, M. (1992). Thresholds of quality - implications for the social-development of children in center-based child-care. *Child Development, 63*, 449-460. doi: 10.1111/j.1467-8624.1992.tb01639.x
- Howes, C., Rodning, C., Galluzzo, D., & Myers, L. (1988). Attachment and child care: Relationship with mother and caregiver. *Early Childhood Research Quarterly, 3*, 403–416. doi:10.1016/0885-2006(88)90037-3
- Howes, C., & Smith, E. W. (1995a). Relations among child care quality, teacher behaviour, children's play activities, emotional security, and cognitive activity in child care. *Early Childhood Research Quarterly, 10*, 381-404. doi:10.1016/0885-2006(95)90013-6
- Howes, C., & Smith, E. W. (1995b). Children and their child care caregivers: Profiles of relationships. *Social Development, 4*, 44–61. doi: 10.1111/j.1467-9507.1995.tb00050.x
- Kontos, S., Howes, C., Galinsky, E., & Shin, M. (1994). *Quality in family child care and relative care*. New York: Teachers College Press.

- Kontos, S., Burchinal, M., Howes, C., Wisseh, S., & Galinsky, E. (2002). An eco-behavioural approach to examining the contextual effects of early childhood classrooms. *Early Childhood Research Quarterly*, 17, 239-258. doi: 10.1016/S0885-2006(02)00147-3
- Kontos, A., & Wilcox-Herzog, A. (1997). Influences on children's competence in early childhood classrooms. *Early Childhood Research Quarterly*, 12, 247–262. doi:10.1016/S0885-2006(97)90002-8
- Lamb, M. E., & Ahnert, L. (2006). Nonparental child care. In W. Damon, R. M. Lerner, K. A. Renninger & I. E. Sigel (Eds.), *Handbook of child psychology: Child psychology in practice* (Vol. 4, pp. 950–1016). Hoboken, NJ: Wiley.
- Lee, S., Y. (2006). A journey to a close, secure, and synchronous relationship. Infant-caregiver relationship development in a childcare context. *Journal of Early Childhood Research*, 4, 133-151. doi: 10.1177/1476718X06063533
- Moss, P., & Penn, H. (1996). Transforming nursery education. London: Paul Chapman.
- Muthen, L. K., & Muthen, B. (2012). 1998-2012. Mplus User's Guide (7th ed.). Los Angeles, CA: Muthen & Muthen.
- NICHD Early Childcare Research Network (1991). *The NICHD study of early childcare and youth development: Phase I manuals*. Retrieved 10 08, 2003, from <http://secc.rti.org/manuals.cfm>
- NICHD Early Child Care Research Network. (1996). Characteristics of infant child care: Factors contributing to positive caregiving. *Early Childhood Research Quarterly*, 11, 269–306. doi:10.1016/S0885-2006(96)90009-5
- Raikes, H. (1993). Relationship duration in infant care time with a high-ability teacher and infant-teacher attachment. *Early Childhood Research Quarterly*, 8, 309–25. doi:10.1016/S0885-2006(05)80070-5

Recchia, S., L. (2012). Caregiver-child relationships as a context for continuity in child care.

Early Years, 32, 143-157. doi:10.1080/09575146.2012.693908

Recchia, S.L., & Dvorakova, K. (2012). How three young toddlers transition from an infant

to a toddler classroom: Exploring the influence of peer relationships, teacher

expectations, and changing social contexts. *Early Education & Development*, 23, 181-

201. doi:10.1080/10409289.2012.630824

Recchia, S. L., Sekino, Y., Brady-Smith, C. L., & Smedley, A. K. (2000, July). *The*

development of infant-caregiver relationships in child care: Group patterns and

individual differences. Poster presented at the XIIth Biennial International Conference

on Infant Studies, Brighton, UK.

Sagi, A., Lamb, M. E., Lewkowicz, K. S., Shoham, R., Dvir, R., & Estes, D. (1985). Security

of infant-mother, -father, and -metapelet attachments among kibbutz reared Israeli

children. *Monographs of the Society for Research in Child Development*, 50, 257–

275.

Schaffer, H. R., & Emerson, P. E. (1964). The development of social attachments in infancy.

Monographs of the Society for Research in Child Development, 1-77.

Sekino, Y., Chen, S., & Recchia, S. L. (2001, July). *Developmental process of caregiver-*

child relationships for Japanese infants and toddlers in care'. Poster presented at the

XIIth Biennial Conference for the International Society on Infant Studies, Brighton,

UK.

Tout, K., De Haan, M., Campbell, E. K., & Gunnar, M. R. (1998). Social behavior correlates

of cortisol activity in child care: Gender differences and time-of-day effects. *Child*

Development, 69, 1247–1262. doi: 10.1111/j.1467-8624.1998.tb06209.x

Van IJzendoorn, M.H., Sagi, A., & Lambermoon, M.W.E. (1992). The multiple caretaker

paradox: Some data from Holland and Israel. In R.C. Pianta (Ed.), *Beyond the parent:*

- The role of other adults in children's lives (pp. 5–24). New Directions for Child Development, 57.*
- Van Schaik, S. D., Leseman, P. P., & Huijbregts, S. K. (2014). Cultural diversity in teachers' group-centered beliefs and practices in early childcare. *Early Childhood Research Quarterly, 29*(3), 369-377. doi: 10.1016/j.ecresq.2014.04.007
- Vaughn, B. E., & Waters, E. (1990). Attachment behavior at home and in the laboratory: Q-sort observations and strange situation classifications of one-year-olds. *Child Development, 61*, 1965–1973. doi: 10.1111/j.1467-8624.1990.tb03578.x
- Viernickel, S. (2000). Spiel, Streit, Gemeinsamkeit. Einblicke in die soziale Kinderwelt der unter Zweijährigen. Landau: Verlag Empirische Pädagogik.
- Votruba-Drzal, E., Coley, R. L., Maldonado-Carreño, C., Li-Grining, C. P., & Chase-Lansdale, P. L. (2010). Child Care and the Development of Behavior Problems Among Economically Disadvantaged Children in Middle Childhood. *Child Development, 81*, 1460–1474. doi:10.1111/j.1467-8624.2010.01485.x
- Waters, E. (1995). The Attachment Q-Set (Version 3.0). *Monographs of the Society for Research in Child Development, 60*.
- Waters, E., Cummings, E.M. (2000). A secure base from which to explore close relationships. *Child Development, 71*, 164-172. doi: 10.1111/1467-8624.00130
- Weisner, T.S. (2005). Attachment as a Cultural and Ecological Problem with Pluralist Solutions, *Human Development, 48*, 89-94. doi: 10.1159/000083219

Attachment and caregiver sensitivity in toddler childcare

Table 1. Descriptives (pairwise deleted correlations $ns = 94-104$).

	1.	2.	3.	4.	5.	6.	7.
1. Attachment security (T1)							
2. Attachment security (T2)	0.29 **						
3. Attachment security (T3)	-0.02	0.36 ***					
4. Group-related sensitivity (T1)	0.30 **	0.01	0.00				
5. Group-related sensitivity (T2)	0.08	0.30 **	0.01	0.13			
6. Group-related sensitivity (T3)	-0.03	0.09	0.44 ***	-0.03	0.09		
7. Dyadic sensitivity (T1)	0.15	0.20 *	-0.01	0.19	0.28 **	0.10	
8. Dyadic sensitivity (T2)	0.10	0.19	0.15	0.24 *	0.24 *	0.19	0.22 *
9. Dyadic sensitivity (T3)	-0.05	0.10	0.23 *	0.12	0.02	0.29 **	0.17
10. Child's sex (0= boy, 1 = girl)	0.24 *	0.31 **	0.20 *	-0.01	0.04	-0.09	0.20 *
11. Child's age (T1)	-0.03	-0.03	-0.12	-0.06	-0.05	-0.16	0.10
12. Child's age (T2)	-0.03	-0.02	-0.12	-0.07	-0.05	-0.15	0.09
13. Child's age (T3)	-0.03	-0.01	-0.11	-0.07	-0.06	-0.13	0.08
n	104	104	103	104	104	103	103
M/%	0.26	0.25	0.26	2.63	2.44	2.44	2.92
SD	0.17	0.15	0.18	0.33	0.39	0.43	0.77
Min	-0.26	-0.16	-0.16	1.46	1.27	1.07	1.33
Max	0.61	0.68	0.61	3.17	3.13	3.11	4.67

Note: * = $p \leq .05$, ** = $p \leq .01$, *** = $p \leq .001$

Attachment and caregiver sensitivity in toddler childcare

Table 1. ... continued

	8.	9.	10.	11.	12.	13.
1. Attachment security (T1)						
2. Attachment security (T2)						
3. Attachment security (T3)						
4. Group-related sensitivity (T1)						
5. Group-related sensitivity (T2)						
6. Group-related sensitivity (T3)						
7. Dyadic sensitivity (T1)						
8. Dyadic sensitivity (T2)						
9. Dyadic sensitivity (T3)	0.09					
10. Child's sex (0= boy, 1 = girl)	0.16	-0.04				
11. Child's age (T1)	-0.02	-0.07	0.14			
12. Child's age (T2)	-0.03	-0.07	0.14	0.99 ***		
13. Child's age (T3)	-0.02	-0.09	0.14	0.99 ***	0.99 ***	
n	100	98	104	104	104	103
M/%	2.59	2.69	54.8%	23.6	25.9	28.2
SD	0.74	0.76		4.71	4.65	4.69
Min	1.00	1.00		10.6	12.6	14.7
Max	4.67	5.00		35.5	37.7	39.7

Note: * = $p \leq .05$, ** = $p \leq .01$, *** = $p \leq .001$

Attachment and caregiver sensitivity in toddler childcare

Table 2. Boys' and girls' attachment security

Attachment security	Boys		Girls		T	df	p
	M	SD	M	SD			
T1	0.22	0.17	0.30	0.17	-2.49	102	.014
T2	0.20	0.13	0.30	0.16	-3.26	102	.002
T3	0.22	0.15	0.29	0.19	-2.05	101	.043

Attachment and caregiver sensitivity in toddler childcare

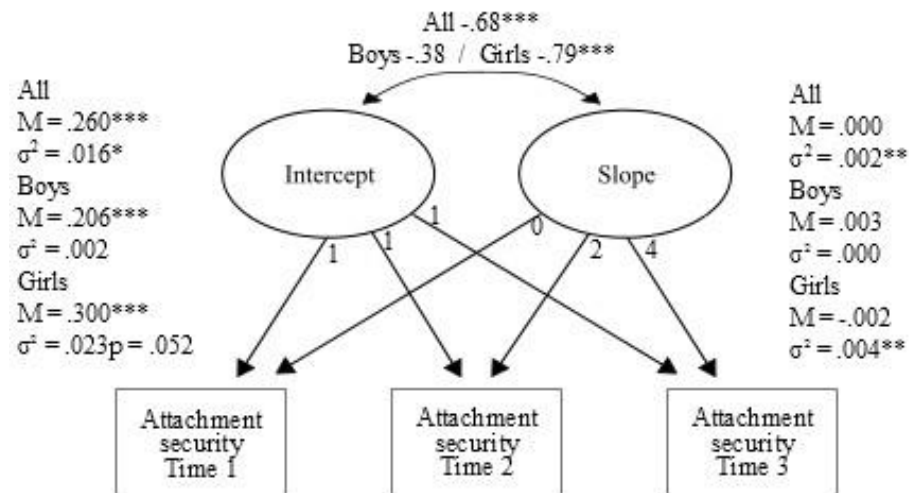


Figure 1. Level of and change in attachment security (latent growth curve model) for all children and boys and girls separately

Note: Uniquenesses were estimated but not depicted for clarity. * = $p \leq .05$, ** = $p \leq .01$, *** = $p \leq .001$

Attachment and caregiver sensitivity in toddler childcare

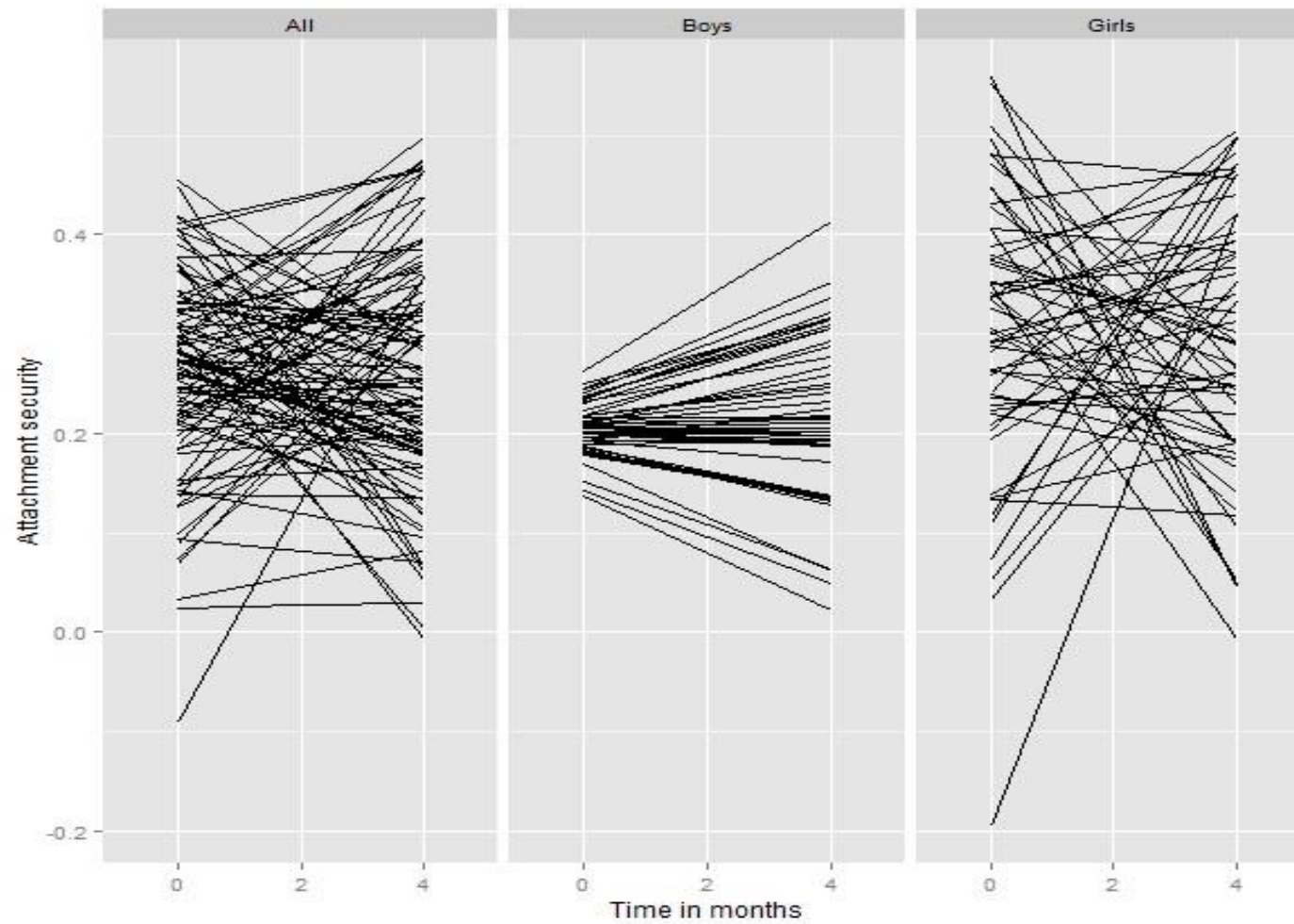


Figure 2. Estimated individual trajectories of attachment security (left: all children ($n = 104$), middle: boys ($n = 47$), right: girls ($n = 57$)).

Attachment and caregiver sensitivity in toddler childcare

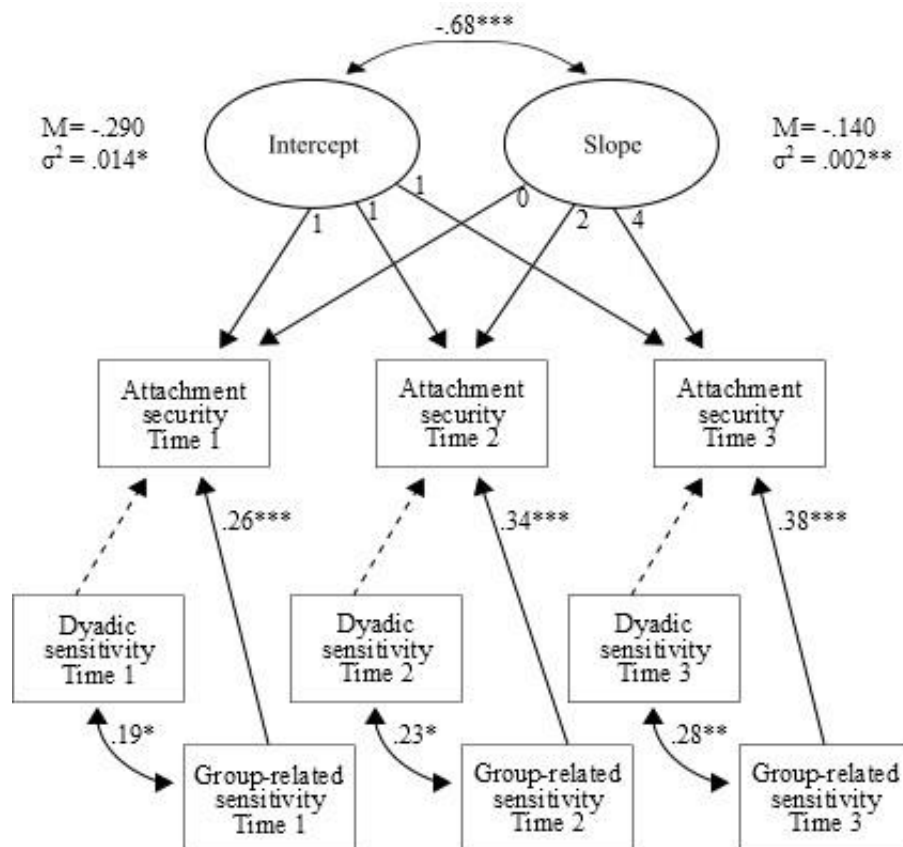


Figure 3. Growth model of attachment security with dyadic sensitivity, and group-related sensitivity as time-varying covariates.

Note: * = $p \leq .05$, ** = $p \leq .01$, *** = $p \leq .001$

ⁱ In an alternative model we estimated autoregressive paths between secure attachment security at the three time-points. These were significant ($\beta = .27$ and $\beta = .32$) indicating relative stability of attachment security over time.