



# Stability and change in teacher–infant interaction quality over time



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## ABSTRACT

Given that an increasing number of infants spend part of the day in center-based childcare in many countries, understanding infants' education and care experiences in these settings is essential. The aims of this study are to examine change in teacher–infant interaction quality over time, and to determine the extent to which teacher and classroom structural characteristics are associated with change in teacher–infant interaction quality. Ninety infant childcare classrooms from the greater metropolitan area of Porto, Portugal, participated in this study. Each classroom was observed twice (6-month interval between Time 1 and Time 2) by trained and reliable observers using the Infant/Toddler Environment Rating Scale – Revised (ITERS-R; Harms et al., 2006), the Classroom Assessment Scoring System – Infant (CLASS-Infant; Hamre et al., 2014), and the Caregiver Interaction Scale (CIS; Arnett, 1989). Additionally, teachers provided demographic information about themselves and structural characteristics of the classroom. Overall results indicated that the quality of teacher–infant interactions changed over time, with a general trend toward lower quality at Time 2. The increase in infant:adult ratio from Time 1 to Time 2 was an important predictor of process quality levels at Time 2, after controlling for prior quality and other structural characteristics. These findings can be informative for policymaking as group size and number of adults per classroom are regulated features of childcare in many countries, including Portugal.

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In western and most industrialized societies, the ecology of early childhood development has been significantly changing in the last decades. An increasing number of children spend part of the day in out-of-home care (Organization for Economic Co-operation and Development [OECD], 2011), for a variety of demographic, social and economic reasons. Portugal is not an exception, having a high rate of full-time early childhood education and care (ECEC) provisions for infants (Gabinete de Estratégia e Planeamento/Ministério da Solidariedade, Emprego e Segurança Social, n.d.a, 2013; OECD, 2011).

As a substantial number of children experience the transition from home to childcare during the first year of life, the quality of ECEC experienced by infants is a concern for their parents and for policymakers (e.g., Jamison, Cabell, LoCasale-Crouch, Hamre, & Pianta, 2014; La Paro, Williamson, & Hatfield, 2014; Ruzek,

Burchinal, Farkas, & Duncan, 2014). The relevance of analyzing the quality of infant education and care experiences in childcare is further underlined by international findings, mainly in the U.S. and in some European countries, documenting the effects of ECEC quality on child development. However, such research is still scarce in other countries, such as Portugal. Additionally, research has been largely focused on the preschool period, with fewer studies exploring quality in infant/toddler care.

Regarding younger children, relationship quality has been particularly emphasized as a crucial feature of ECEC quality, and stability of care has been highly recommended (e.g., Cryer et al., 2005; ZERO TO THREE, 2009). However, research focusing on the quality of adult–child interactions in infant care is limited and data on the stability and change of that quality is scarce. The present study examines the nature of change in teacher–child interaction quality in infant classrooms over a 6-month interval, and how those changes are associated with teacher and classroom structural characteristics, aiming to contribute further understanding of infant education and care experiences in Portuguese childcare settings in the first year of life.

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## 1. Quality of ECEC and child development

There is no consensus about the framework and methods used in studies of quality of ECEC. However, most studies consider two broad dimensions of quality: structural and process (e.g., Bryant, Burchinal, & Zaslow, 2011; Howes et al., 2008). Structural features include variables that can be regulated, such as caregiver education and training, group size, and child:staff ratios. Process characteristics include variables related to children's direct experiences in classrooms, such as teacher-child interactions (e.g., Bryant et al., 2011; Helmerhorst, Riksen-Walraven, Vermeer, Fukkink, & Tavecchio, 2014; La Paro et al., 2014), which are frequently regarded as the core of process quality (Helmerhorst et al., 2014). Indeed, both developmental theory and empirical studies have established that teacher-child interactions can be understood as critical proximal processes (e.g., Hamre & Pianta, 2007; Jamison et al., 2014; La Paro et al., 2014; Mortensen & Barnett, 2015), and are considered the primary mechanisms of human development if they are regular and occur over extended periods of time (Bronfenbrenner & Morris, 1998). These processes can vary substantially depending on the characteristics of the developing person and of contexts, both closer and more distant, as well as on the periods of time during which these processes occur (Bronfenbrenner & Morris, 1998). Proximal processes involve the interaction between the individual and the persons, objects and symbols in the immediate environment (Bronfenbrenner & Evans, 2000).

Currently it is acknowledged that ECEC quality has modest, but important effects on children's development (Burchinal, Kainz, & Cai, 2011). Results of a large number of studies indicate positive immediate effects of higher-quality ECEC on preschoolers' cognitive, executive function and social skills (e.g., Head Start Family and Child Experiences Survey, 2001; NICHD Early Child Care Research Network, 2006; Peisner-Feinberg et al., 2001; Weiland, Ulvestad, Sachs, & Yoshikawa, 2013), with some studies specifically suggesting that quality of care also predicts outcomes for infants and toddlers (e.g., Burchinal, Roberts, Nabors, & Bryant, 1996; NICHD Early Childhood Research Network, 2000; Pessanha, Pinto, & Barros, 2009). Research has also found positive effects of high-quality ECEC on long-term success indicators such as higher employment rates, less delinquency/criminality, and fewer adolescent pregnancies (e.g., Campbell, Ramey, Pungello, Sparling, & Miller-Johnson, 2002; Ramey et al., 2000; Reynolds, Miedel, & Mann, 2000; Vandell, Belsky, Burchinal, Steinberg, & Vandergrift, 2010). Furthermore, it has also been acknowledged that high-quality ECEC in the first years of life might reduce the negative impact of poverty, low maternal education, and other risk factors associated with negative child outcomes (e.g., Burchinal, Vandergrift, Pianta, & Mashburn, 2010; Leseman & Slot, 2014; Peisner-Feinberg & Yazejian, 2010; Pessanha, 2008). Although many research studies have examined associations between quality of ECEC and child outcomes, less empirical evidence is available on the quality of *infant* classrooms, especially in Portugal (Barros et al., 2016; Jamison et al., 2014).

## 2. Quality of teacher-infant interactions

The quality of teacher-child interactions has an important role in children's learning and development, but is especially relevant for infants. Early nurturing relationships between young children and caregivers have the potential to provide a strong foundation for future development in all domains (Shonkoff & Phillips, 2000). Indeed, as Edwards and Raikes (2002) noted, "through the pleasure and emotional sharing of a warm, loving, reciprocal exchange with an emotionally available caregiver, a baby learns about people and the world and grows cognitively, socially, and emotionally in tiny, manageable steps" (p. 10). Therefore,

as children develop so quickly in all domains (physical, cognitive, social and emotional) during infancy, they require positive, responsive, stimulating and stable interactions with caregivers (e.g., National Association for the Education of Young Children [NAEYC], 2009; Shonkoff & Phillips, 2000; Wittmer & Petersen, 2006; ZERO TO THREE, 2009). Relationships are particularly important for developing several competencies, such as self-awareness, social competence, and emotional regulation (Shonkoff & Phillips, 2000). Though most of current evidence regarding early relationships is based on the parent-child relationship literature, some studies suggest that, as children enter childcare, teachers play a critical and unique role in shaping infants' development and learning (Hamre, LaParo, Pianta, & LoCasale-Crouch, 2014). In fact, in center-based care, adults must acknowledge the foundational role of relationships for human development, and consider not only children's developmental characteristics and needs, but also their emotional needs (NAEYC, 2009; ZERO TO THREE, 2009).

The period of child transition and adjustment to childcare is a critical and complex period (Balaban, 2011; Daniel & Shapiro, 1996; Merrill, 2010; Rapoport & Piccinini, 2001), requiring infants to adapt to new spaces, routines, and adult caregivers (Datler, Ereky-Stevens, Hover-Reisner, & Malmberg, 2012; Fernandez, 2004). Daniel and Shapiro (1996) state that this period represents a major developmental challenge, since it requires that children build new relationships with other care providers in a completely different environment, at the same time they are still building relationships with the main caregivers in the home environment. Consequently, there must be a concern with ensuring conditions for the development of close relationships with caregivers in the childcare setting, namely, continuity in classroom staff and consistent and responsive interactions to the individual characteristics and needs of infants (Balaban, 2011; Daniel & Shapiro, 1996).

Despite its relevance to children's development and learning, findings from several studies suggest that access of very young children to high-quality care environments with responsive teacher-child interactions is limited. In Portugal, a previous study of toddler ECEC found that only 39% of the 160 observed classrooms provided quality that minimally met custodial care and basic developmental needs, let alone provided responsive teaching (Barros & Aguiar, 2010). In the U.S., although quality levels are generally higher, concerns about ECEC for infants and toddlers are also evident. In the Cost, Quality, and Child Outcomes in Child Care Centers Study, Phillipsen, Burchinal, Howes and Cryer (1997) reported low quality scores, indicating that the health and well-being of infants/toddlers was cared for only minimally, and warm and supportive relationships were observed less than half of the time. Similarly, in the NICHD Study of Early Child Care, 53.2% of the observed classrooms showed mediocre quality, and 8.1% low-quality (NICHD Early Childhood Research Network, 2000, 2005). More recently, a small study of 30 infant classrooms revealed that teacher-child interactions were only in the medium range (e.g., Jamison et al., 2014). For over two decades, the quality of adult-infant interactions has been measured with valid and reliable observational measures, such as the Caregiver Interaction Scale (CIS; Arnett, 1989) and the Infant/Toddler Environment Rating Scale (ITERS/ITERS-Revised; Harms, Cryer, & Clifford, 1990; Harms, Cryer, & Clifford, 2003; Harms, Cryer, & Clifford, 2006). Now a new measure, the Classroom Assessing Scoring System-Infant (CLASS-Infant; Hamre et al., 2014), is becoming more widely used.

### 2.1. Quality of teacher-infant interactions over time

Based on the foregoing, the quality of adult-child interactions seems to play an important role in child development and well-being (e.g., Edwards & Raikes, 2002; Hamre et al., 2014; Shonkoff & Phillips, 2000). In this context, several authors have explored the

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