



Nursing Child Assessment Satellite Training Parent-Child Interaction Scales: Comparing American and Canadian Normative and High-Risk Samples

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ABSTRACT

Purpose: Many nurses rely on the American Nursing Child Assessment Satellite Training (NCAST) Parent-Child Interaction (PCI) Teaching and Feeding Scales to identify and target interventions for families affected by severe/chronic stressors (e.g. postpartum depression (PPD), intimate partner violence (IPV), low-income). However, the NCAST Database that provides normative data for comparisons may not apply to Canadian families. The purpose of this study was to compare NCAST PCI scores in Canadian and American samples and to assess the reliability of the NCAST PCI Scales in Canadian samples.

Methods: This secondary analysis employed independent samples *t*-tests ($p < 0.005$) to compare PCI between the American NCAST Database and Canadian high-risk (families with PPD, exposure to IPV or low-income) and community samples. Cronbach's alphas were calculated for the Canadian and American samples.

Results: In both American and Canadian samples, belonging to a high-risk population reduced parents' abilities to engage in sensitive and responsive caregiving (i.e. healthy serve and return relationships) as measured by the PCI Scales. NCAST Database mothers were more effective at executing caregiving responsibilities during PCI compared to the Canadian community sample, while infants belonging to the Canadian community sample provided clearer cues to caregivers during PCI compared to those of the NCAST Database. Internal consistency coefficients for the Canadian samples were generally acceptable.

Conclusions: The NCAST Database can be reliably used for assessing PCI in normative and high-risk Canadian families.

Practical implications: Canadian nurses can be assured that the PCI Scales adequately identify risks and can help target interventions to promote optimal parent-child relationships and ultimately child development.

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Introduction

It is well recognized that sensitive, responsive caregiving is crucial to children's healthy development (National Scientific Council on the Developing Child, 2006; National Scientific Council on the Developing Child, 2010). Indeed, this concept is so well translated into common parlance and understanding, that the metaphors of healthy "serve and return relationships" as foundational to children's developing "brain architecture" are used in many regions of Canada and the United

States of America (USA) (Palix Foundation, 2015). Serve and return relationships involve parents being sensitive and responsive to the cues and needs of their children and demonstrating consistent response patterns to them through mutually adaptive and nurturant parent-child interactions (PCIs) (Ainsworth, Blehar, Waters, & Wall, 1978; Bohr & BinNoon, 2014). Sensitive caregiving contributes to the development of attachment security between a caregiver and a child (McElwain & Booth-LaForce, 2006), which subsequently enhances cognitive and social developmental outcomes among children (Singer et al., 2003). Overall, favourable PCI quality during day-to-day interactions such as feeding (Britton, Britton, & Gronwaldt, 2006; Bigelow et al., 2014) and teaching child-relevant activities (i.e. turning pages in a children's book during reading, squeezing a squeak toy during play) (Duggan, Berlin, Cassidy, Burrell, & Tandon, 2009; Rispoli, McGoey, Koziol, &

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Schreiber, 2013) have been identified as essential components which promote secure parent-child attachment. Indeed, nurses commonly assess PCI in order to identify risks and develop targeted interventions to support healthy serve and return relationships and healthy child development. Internationally, to assess PCI, nurses often rely on the “gold standard” Nursing Child Assessment Satellite Training (NCAST) PCI Teaching and Feeding Scale assessments; however the degree to which these PCI Scales' normative data may be applied to non-American samples, such as Canadian families, is unclear.

Parent-Child Relationships Among High-risk Populations

A common finding in nursing research is that socioeconomic hardship and severe/chronic stress, such as intimate partner violence (IPV) and postpartum depression (PPD), reduces the quality of parent-child relationships (Letourneau, Stewart et al., 2011; Letourneau, Morris, Secco, & Hughes, 2013; Mortensen & Mastergeorge, 2014). Indeed, belonging to a high-risk population impairs PCI quality during typical, daily teaching (Sumner & Spietz, 1994a) and feeding interactions (Reid & Meadows-Oliver, 2007). Caregivers who are exposed to stressful circumstances are characteristically less responsive to infants' and children's cues and distress (Letourneau, 1997; Riesch, Anderson, Pridham, Lutz, & Becker, 2010; Spieker, Oxford, Kelly, Nelson, & Fleming, 2012). Given the paramount importance of sensitive, responsive PCIs to children's development, chronic environmental or parental stress that negatively impacts PCIs is widely considered “toxic” to children's development (National Scientific Council on the Developing Child, 2005, 2006, 2008/2012, 2009, 2012; Shonkoff et al., 2012). Moreover, Barlow et al. (2016) assert that socioeconomic adversity interacts synergistically with severe/chronic stress to impair parent-child attachment throughout childhood. Living in a low-income neighborhood (Sadler et al., 2013) or even immigration from a low-income country may undermine the security of a child's attachment to his or her caregiver (Magai et al., 2001). Similarly, diminished family functioning and intimate partner violence contributes to developmental problems in children over time, such as externalizing and internalizing behavioral problems (Davies, Cummings, & Winter, 2004).

Parent-Child Interaction (PCI) Teaching and Feeding Scales

To support sensitive, responsive caregiving, and by extension healthy PCI, health professionals rely on assessment tools to identify areas of strength and difficulty for follow-up intervention with families (Kelly, Zuckerman, & Rosenblatt, 2008). Internationally, among the most commonly employed measures are the PCI Teaching and Feeding Scales (Sumner & Spietz, 1994a, 1994b) available from the NCAST Program at the University of Washington, Seattle. The origin of the scales began in the early 1970s, when the Division of Nursing of the United States Public Health Service created the Nursing Child Assessment Project team. This collaboration with Dr. Kathryn Barnard's research team at the University of Washington's School of Nursing aimed to develop a method for the discernment of children who were at risk for developmental problems (Sumner & Spietz, 1994a, 1994b). The PCI Scales were based on the concepts elucidated in the Barnard Model (Barnard, Booth, Mitchell, & Telzrow, 1988), in which optimal parent-child relationships were characterized as mutually adaptive, positive interactions that promote optimal child development and crucially, in which both parents and children have important roles. Parents must demonstrate affectionate caregiving by being sensitive and responsive to infant/child needs and infants/children must provide clear cues so that caregivers can respond appropriately. Barnard's additional theoretical work described environmental or parental stressors that can undermine the quality of PCI (Barnard, Eyres, Lobo, & Snyder, 1983).

The original NCAST PCI Teaching and Feeding Scales were developed in 1972 (Oxford & Findlay, 2013) and were revised in 1979 to improve

feasibility within research and clinical settings (Oxford & Findlay, 2013). While minor revisions have been undertaken since, the PCI scales have largely remained unchanged.

The NCAST PCI Teaching and Feeding Scales are reliable and valid measures for assessing PCI quality in typical daily interactions (Badr, Bookheimer, Purdy, & Deeb, 2009; Fowles & Horowitz, 2006; Speltz et al., 2000), during feeding or meal consumption (Sumner & Spietz, 1994b), and that of teaching a specific task (Sumner & Spietz, 1994a). The feasibility for using these scales cross-culturally to study PCI quality has been demonstrated by studies that were conducted in, for example, Bangladesh (Frith, Naved, Ekström, Rasmussen, & Frongillo, 2009), Japan, (Teramoto, Hirose, & Bakeman, 2010) and among Canadian Aboriginal (Letourneau, Hungler, & Fisher, 2005) and Mexican American samples (Kolobe, 2004). They have been widely used for the examination of PCI among a wide range of high-risk populations, such as infants/children suffering from a suspected brain injury (Badr, Garg, & Kamath, 2006), exposed to maternal substance abuse (Suchman et al., 2010), socioeconomic hardship (Schiffman, Omar, & McKelvey, 2003) and neglect/abuse (Huebner, 2002). With these tools, health professionals in clinical and research centers have a greater capacity for identifying less than optimal caregiving and can plan interventions appropriately (Bryanton, Gagnon, Hatem, & Johnston, 2009).

The PCI Teaching and Feeding Scales comprise six subscales for the investigation of caregiver behavior and regulation in infants and young children (Sumner & Spietz, 1994a, 1994b). The Teaching Scale assessment targets caregivers and their infants or young children ranging in age from birth and 36 months and ideally occurs over a period of 1 to 5 minutes (Sumner & Spietz, 1994a). The Feeding Scale assessment targets caregivers and their infants ranging in age between birth and 12 months and typically occurs over a 10 minute period (Sumner & Spietz, 1994b). During feeding and teaching interactions, the execution of caregiver responsibilities is gauged by four subscales examining caregivers' sensitivity to infant cues, alleviation of infant distress, and social-emotional and cognitive growth fostering opportunities provided to the infant or young child (Sumner & Spietz, 1994a, 1994b). In addition, infants and young children make an important contribution to the overall interaction, measured by two subscales examining the clarity of cues the infant or child provides and the child's responsiveness to the caregiver.

The Teaching Scale comprises 73 binary items and the Feeding Scale comprises 76 binary items that assess the occurrence versus non-occurrence of specific behaviors (0 = no, 1 = yes), for total possible scores of 73 and 76 respectively. For the Teaching Scale, the ranges for the subscales are as follows: sensitivity to cues (0–11), response to child's distress (0–11), social-emotional growth fostering (0–11), cognitive growth fostering (0–17), clarity of cues (0–10), and responsiveness to caregiver (0–13). For the Feeding Scale, the ranges for the subscales are as follows: sensitivity to cues (0–16), response to child's distress (0–11), social-emotional growth fostering (0–14), cognitive growth fostering (0–9), clarity of cues (0–10), and responsiveness to caregiver (0–13). A higher score indicates a more favourable PCI quality. The caregiver and child subscales also contain contingency items that indicate whether the actions of one participant evoke the expected response from the other. To be qualified to perform NCAST scoring, attendance at a workshop led by an NCAST-certified instructor is mandatory (Nakamura, Stewart, & Tatarka, 2000). Individuals must attain 85% inter-observer reliability to use the scales in clinical work and 90% for use in research.

Extensive research has established the feasibility of the PCI Scales for examining the quality of caregiver-child interactions (e.g. Bowie, 2005; Banerjee & Tamis-LeMonda, 2007; White-Traut et al., 2013). Advantages include the brief training period (Horowitz, Logsdon, & Anderson, 2005), and the ability to score teaching and feeding interactions from either live observations or video recordings (Byrne & Keefe, 2003). Furthermore the dichotomized scoring scheme of the PCI Scales, based on observable parent and child behaviors, is advantageous

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