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Exploring early communicative behaviours: A fine-grained analysis of infant shows and gives

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ABSTRACT

The ability to share and direct attention is a pre-requisite to later language development and has been predominantly studied through infant pointing. Precursors to pointing, such as showing and giving gestures, may display similar communication skills, yet these gestures are often overlooked. This may be due to difficulty in discerning these gestures in interaction. The current study had two aims; firstly, to identify the micro-behaviours associated with showing and giving gestures in infants under 12 months, in order to ascertain whether these form two discrete communicative behaviours. Secondly, to examine whether these micro-behaviours predicted caregiver responses to these gestures. Fine-grained coding of show and give gestures, their micro-behaviours and caregiver responses was conducted through secondary analysis of naturalistic, triadic interactions between 24 infants, caregivers and a selection of toys. Findings suggested that the micro-behaviours arm position, hand orientation and eye-gaze, were significant predictors of infant gesture type, however only arm positioning was a significant predictor of caregiver response. This suggests that early showing and giving gestures can be classified based on some associated micro-behaviours, however caregiver's responses may not be contingent on these same cues, potentially resulting in difficulty understanding infant gestures. Our findings enhance our understanding of infant communication before 12 months, provide guidance to both researchers and caregivers in the identification of infants' early shows and gives, and highlight the need for greater study of these early pre-linguistic behaviours.

1. Introduction

Between 9–12 months, infants experience a transition in their interaction with the world. Systematic patterns emerge in their communicative behaviours as they begin to use deictic gestures combined with eye-gaze, vocalisations, body movements and facial expressions to engage in social interaction with a communicative partner (Bates, 1979; Igualada, Bosch & Prieto, 2015; Liszkowski, Brown, Callaghan, Takada, & De Vos, 2012). The presence of these multimodal communicative behaviours is believed to be an indicator of an infant's joint attention abilities, and a considerable body of evidence links these skills to later language development (Kristen, Sodian, Thoermer, & Perst, 2011; Laakso, Poikkeus, Katajamäki, & Lyytinen, 1999).

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Generally, these early communicative skills have been studied mainly through the pointing gesture (Carpenter, Nagell, & Tomasello, 1998; Cochet and Vauclair, 2010; Tomasello, Carpenter & Liszkowski, 2007). Pointing is perceived as a tool used to initiate joint attention between the infant and adult and pointing declaratively (i.e. pointing with a motive to share or direct attention onto a specific object or event) is a good predictor of later language outcomes (Colonnesi, Stams, Koster, & Noom, 2010; Tomasello et al., 2007). Infants begin to use pointing with a communicative intent at around 11–12 months of age (Fusaroa, Vallotton, & Harris, 2014) and both experimental and non-experimental studies consistently highlight a relationship between this type of pointing and skills in both the production and comprehension of language, particularly verbal naming (see Colonnesi et al., 2010 for a review). Pointing is generally perceived as a landmark communication skill at around 12 months of age (Colonnesi et al., 2010; Liszkowski, 2010).

There is evidence however to suggest that infants can engage in communicative behaviours prior to the emergence of pointing. Bates, Camaioni, and Volterra (1975) found that showing and giving behaviours emerged around 10 and 11 months respectively, whereas pointing with communicative intent did not appear until 12–13 months. The shift from showing and giving to pointing indicates the infant's understanding of the difference between the self and objects. Pointing is believed to be more cognitively complex as it exists outside of the object context and draws attention to more distal referents (Bates, Thal, Whitesell, Fenson & Oakes, 1988). However, both showing and giving behaviours also reflect the ability to initiate joint attention and demonstrate an understanding that the adult is an agent separate from the environment and capable of engaging with an object. Support for the claim that shows and gives are precursors to pointing is presented in Cameron-Faulkner, Lieven, Theakson, & Tomasello (2015). In their study of 10–12 month old infants, shows and gives emerged prior to pointing behaviours and also had a strong association with the later use of points but not reaches (the latter of which are associated with imperative behaviours and are not deemed to be as cognitively complex in nature). Beuker, Rommelse, Donders & Buitelaar (2013) examined the developmental trajectory of specific joint attention skills and their interrelations with later vocabulary size. They found that infants who developed joint attention skills at an earlier age, specifically gestures which involved directing attention (such as showing, giving and pointing) displayed larger receptive and expressive vocabulary growth earlier in life. Thus, showing and giving gestures may be good candidates for studying the foundations of early communication and the skills that make us uniquely human.

To date pre-linguistic showing and giving behaviours have been under-researched, particularly when compared to studies on pointing. A potential reason for this absence is the lack of a clear definition of the two constructs. Bates et al. (1975, 1976) highlighted the difficulty in distinguishing showing and giving behaviours, suggesting that their function is often ascertained by how others react to the social context and that often, infant intentions are misinterpreted by caregivers. They referred to shows and gives as an extension of the arm towards the adult and distinguished between the two behaviours based on whether the infant gave the toy to the adult or kept it for themselves. Clements and Chawarska (2010) built on these definitions in their study of shows, gives and points in 9 and 12 month olds with autism. Shows were defined as "a person's arm extending toward another person's face while holding an object" (p. 48) whereas giving behaviours were described as "placing an object in another person's hand or pushing an object at least halfway toward another person" (p. 48). Even with these more detailed definitions, the authors noted that pointing gestures were more salient than showing gestures due to their specific hand form (i.e. an outstretched arm with the index finger extended).

The lack of salience of many showing gestures creates problems from a methodological viewpoint. Typically, naturalistic research on gesture development is conducted through observation or parental diaries. Although this provides an ecologically valid measure of infants' spontaneous gestures (Capirci, Iverson, Pizzuto & Volterra, 1996; Woodward, 2009, Crais, Douglas, and Campbell (2004) highlighted the concern researchers often have over parental report methods, (i.e. through parental diaries) as the reliability of their interpretations is questioned. Whilst researchers may be trained to recognise behaviours in infants, parents may find it difficult to recognise "researcher defined" gestures or their functions, potentially jeopardising the validity of communicative development research (Woodward, 2009). The difficulty in identifying these gestures extends to caregivers in the home environment too. Bates et al. (1975, 1979) highlighted the problem of caregivers misinterpreting these gestures as instrumental acts or overlooking this action completely. Early pointing studies have already established that children rely on verbal feedback to determine connections between their pointing gestures and intentions, and adults who respond promptly, contingently and appropriately to infant actions tend to improve infants' subsequent production and comprehension of words (Colonnesi et al., 2010; Rowe & Goldin-Meadow, 2009). Furthermore, observation of the responses of others facilitates not only social learning, but enables the understanding of intentional communication (i.e. awareness of other people's goals during interaction) which plays a fundamental role in language development (Elsner, Bakker, Rohlfing, & Gredebäck, 2014).

Theoretically, being able to distinguish these gestures would provide greater insight into the emergence of intentional communication in pre-linguistic infants. Towards the end of their first year, infants' communicative competencies increase and they begin to use gestures with a number of accompanying behavioural characteristics, such as systematic hand shapes and vocalisations, to help more directly express their social intentions. Exploration of these behaviours could provide insight into the different motives underlying early pre-linguistic gestures. It would also help determine whether these gestures are fully ambiguous and so interpretable only from the context of the shared interaction and preceding actions. The difficulty in pinpointing infant intentions outside of adults' responses raises the question of whether infants formulate an intention before they hold out a toy, or if their behaviours are contingent on the adult's response. If this were the case, it may be impossible to distinguish between early showing and giving gestures without relying on caregiver feedback. If, however, in a typical interactional context, shows and gives involved distinct behavioural cues (e.g. a particular hand position) it would