The importance of face-to-face play for infants' social development

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Face-to-face play is one of the main forms of interaction between caregivers and their infants in the first few months of life. There are numerous benefits that face-to-face play provides for infants' social cognitive development. Playful face-to-face interactions support the development of a bond between the infant and the caregiver, contribute to the development of the infant's sense of self, and support the development of infants' ability to copy others' facial expressions. This article discusses the implications of these findings for practitioners, and provides pointers for the various ways in which face-to-face play between infants and their caregivers can be encouraged.
Keywords: face-to-face interaction, infancy, parent-child relationship, social cognition

When human infants are born, they are limited in the ways in which they can interact with the world. They have minimal head control, their limb movements are largely uncoordinated, and it is not until about four months of age that they can reach for and grasp objects. However, one thing young infants do have control over is where they direct their attention, and studies have shown that, from the moment they are born, infants are especially attracted to social stimuli. For example, newborns and young infants preferentially orient towards faces (Johnson et al.,1991) and seem particularly motivated to pay attention to faces that appear ready to interact with them. They prefer to look at faces with open as opposed to closed eyes (Batki et al., 2000), and to faces that look at them instead of away from them (Farroni et al., 2002). Given these findings, it is unsurprising that one of the main ways in which infants engage in play in the first few months of life is through face-to-face interactions. The kind of play caregivers and their infants engage in during these interactions includes imitation games, vocal exchanges, and rhymes or songs that are associated with movements and physical manipulation of the infant's body such as 'Peekaboo' or 'This little piggy' (Fantasia et al., 2014). These interactions not only provide an enjoyable way to spend time for both the infant and the caregiver, they also play an important role in the infant's social cognitive development.

Because the main goal of early caregiver-infant interactions is to share experiences with one another, it can be difficult to distinguish between regular social interactions and face-to-face play (Markova, 2018). In the current article, I will follow Burghardt's definition and characterise face-to-face play as any situation in which the infant and caregiver are in a face-to-face context and engaged in repeated, spontaneous and enjoyable behaviour that does not serve an immediate function in the context in which it appears, and which is initiated in the absence of acute or chronic stress (Burghardt, 2011).

THE ROLE OF FACE-TO-FACE PLAY IN THE DEVELOPMENT OF SOCIAL EXPECTATIONS

Face-to-face play is ubiquitous in infant-caregiver interactions. Around 10% of the time that caregivers spend with their infant under the age of one is occupied by playing (U.S. Bureau of Labor statistics, 2019). Taking into account the fact that the majority of caregiver-infant interactions in the first year of life are focussed on physical care, this percentage of time spent in play situations is relatively high. Additionally, when caregivers interact with an infant whose physical needs are met, face-to-face play seems to be the dominant activity. A recent study by Markova (2018) found that almost 77% of mother-infant dyads spontaneously engaged in game routines when asked to interact with their infant as they normally would.

Early face-to-face playful interactions are typically characterized by a turn-taking structure and a predictable rhythm (e.g. Trevarthen, 1993). For example, the caregiver may talk to the infant and in the pauses between her utterances, the infant coos back. Such 'protoconversations' are thought to form the basis of social communication and language development as they allow infants to practise the sounds of their language and its conversational rhythm (e.g. Bateson, 1975). These face-to-face interactions have a clear, predictable temporal structure and from about two months of age, infants are sensitive to violations of the timing of these interactions (e.g. Murray & Trevarthen, 1985). For example, infants reduce their body movements and positive vocalisations and avoid their mothers' gaze when mothers leave out the rhyme or gestures of a familiar social game

(Fantasia et al., 2014). Such studies suggest that through face-to-face interactions with their caregivers, infants form expectations from a very young age about others' social responsiveness. By virtue of their high level of predictability and turn-taking, playful early face-to-face interactions can be expected to contribute to the development of a secure attachment between the infant and the caregiver. Indeed, studies have shown that the amount of face-to-face play initiated by the mother (Kiser et al., 1986) and the mother's responsiveness during this kind of play (Ricks, 1982) are associated with the infant demonstrating a secure attachment later in life. Although these studies should not be taken as causal evidence - because the same characteristics that lead to successful face-to-face play between caregiver and infant may also lead to a more secure attachment style – they nevertheless suggest that early face-to-face communication in the form of play may be especially relevant to building an emotional bond between the infant and caregiver (Kiser et al., 1986). More direct evidence for the importance of face-to-face interaction for social development comes from studies conducted with monkeys. Researchers found that newborn rhesus monkeys who received four weeks of daily face-to-face interactions with human caregivers spent more time in social interactions with peers at two months of age than monkeys in the control group (Dettmer et al., 2016).

IMPLICATION FOR PRACTICE

By encouraging caregivers to engage in face-to-face play activities, practitioners can help provide the infant with opportunities to learn key information about the caregiver, about how humans interact, and lay the foundations of early social communication.

THROUGH OTHERS WE BECOME OURSELVES: HOW FACE-TO-FACE PLAY IMPACTS ON THE DEVELOPMENT OF THE 'SENSE OF SELF'

Face-to-face play may also help infants learn about themselves. When engaged in face-to-face interactions, caregivers often imitate their infant (Moran et al., 1987). They may blow a raspberry when the infant blows a raspberry, or stick out their tongue in an exaggerated manner when the infant does so. These playful imitative interactions provide infants with a 'social mirror' in which they see their own actions reflected by someone else. It has been suggested that this social mirroring helps infants see themselves through the others' eyes, thereby contributing to the development of their 'sense of self' (Prinz, 2017; Gergely & Watson, 1996).

The sense of self is often assessed via the mirror self-recognition task (Amsterdam, 1972). In this task, toddlers' behaviours in front of a mirror are observed after a researcher has covertly placed a red mark on their cheek. If the toddler reaches for or points to the mark on their face, they are thought to 'pass' the task and show evidence of self-recognition. Toddlers typically start to pass the mirror self-recognition task between 18 and 24 months of age (Amsterdam, 1972).

There is some evidence from studies with primates that social interactions play a role in the development of the sense of self. For example, it was found that chimpanzees reared in isolation only started to show self-directed behaviour (e.g. touching their face) in front of the mirror after three months of social experience (Gallup, 1977). It seems that the opportunity to view oneself from another's point of view is important in the development of our ability to recognise ourselves, and face-to-face imitation games may play an important role in this process in human infancy.

Imitation games may also help infants learn about their emotions (Gergely & Watson, 1996). When infants express anger or sadness during face-to-face interactions, sensitive caregivers tend to copy their facial expressions in an exaggerated and empathetic manner. This mirroring helps infants understand the link between their internal emotional state and the accompanying facial expression, which in turn supports their ability to attribute emotions to themselves (Gergely & Watson, 1996). It is therefore important for caregivers to be sensitive to the infant's emotions and mirror them appropriately. There is some evidence that a lack of sensitive parenting in infancy is associated with inefficient emotion regulation in childhood (Lindblom et al., 2016).

FACE-TO-FACE PLAY AND THE DEVELOPMENT OF FACIAL MIMICRY

Recent studies have shown that imitative face-to-face interactions also support the development of facial mimicry (de Klerk et al., 2019). Facial mimicry is the tendency to spontaneously and unconsciously copy someone's facial actions and expressions. It has been suggested that this process in which we activate the same facial muscles as the person we are observing supports the recognition of their emotional expression (e.g. Wood et al., 2016) and facilitates empathy (e.g. Stel & van Knippenberg, 2008).

Some researchers claim that the ability to copy others' facial actions is present from birth, citing evidence that newborn infants will stick out their tongue when they see someone else do this (Meltzoff & Moore, 1977). However, this is a controversial area and in recent years, evidence has accumulated for the idea that newborns' tongue protrusion may instead reflect an oral-exploratory mechanism (Ray & Heyes, 2011; Jones, 2006). As newborn infants use their mouth to explore the world, they will stick out their tongue whenever something exciting is happening - and when this exciting event happens to be a caregiver sticking out their tongue, it will look as if the infant is mimicking.

Instead of being an inborn ability, some researchers have proposed that facial mimicry

develops through imitative social interactions with caregivers. By copying their infants' facial actions during playful face-to-face interactions, caregivers enable infants to make a link between the motor commands needed to perform facial actions and what those facial actions look like (Ray & Heyes, 2011). The link between what a facial action looks like and what it feels like to perform it then allows infants to mimic others' facial actions. Indirect evidence for this idea comes from studies on dummy/pacifier use in infancy. Studies have found that adults show impaired recognition of infants' facial expressions and a reduced tendency to copy them when the infants have a dummy in their mouth (Rychlowska et al., 2014). If dummy-use reduces caregiver imitation of the infant's facial expressions, we would expect high levels of dummy-use to be related to lower facial mimicry abilities as confirmed by Niedenthal et al., (2012) who found that a longer period of daytime dummy use in infancy was associated with lower levels of facial mimicry in seven-year-old boys.

Facial mimicry supports recognition of emotional expression

A recent study from our lab provides more direct evidence for the idea that imitative games give infants the experience they need to learn to copy others' facial actions (de Klerk et al., 2019). In this study, we asked parents to interact with their four-month-old infant as they would at home. We filmed their interaction and counted the number of times the mum copied her infant. Next, we looked at the infant's tendency to mimic other people's facial actions by measuring their facial muscle activation while they watched videos of models performing facial actions such as opening their mouth or raising their eyebrows. We found that the infants' tendency to mimic the facial expressions in the videos was related to their mothers' tendency to copy their facial expressions during the play session. Crucially, we found that these effects did not generalise to mimicry of hand actions. This suggests that it is not the case that infants of high mimicking mothers show greater mimicry overall, but rather that mimicry of facial actions specifically depends on the infant having received mirror experience through maternal face-to-face imitation (de Klerk et al., 2019).

This work suggests that if infants spend less time in imitative games with their caregivers, this may impact their tendency to copy others. Field et al., (2005) found that mothers with depression and high anxiety and high anger spent less time imitating their infants than mothers whose depression was associated with low anxiety and low anger. Infants of high anger mothers also imitated less than the infants of low anger mothers. Similarly, Cress et al., (1998) found that parents of infants with physical disabilities reported that they almost never imitated their infants' gestures or movements. At 19 months, these infants showed a reduced ability to imitate movements, despite these movements being within the range of their physical capabilities.

IMPLICATIONS FOR PRACTICE

- As mimicry plays an important role in social interactions by enhancing rapport and affiliation (Chartrand & Lakin, 2013), it is important that caregivers are aware of the importance of imitative games in supporting their infant's ability to mimic others. Infants generally enjoy being copied and their positive feedback in the form of smiles will encourage most caregivers to engage in this behaviour.
- Practitioners may want to make caregivers aware that besides having a potential impact on language development (Whitmarsh, 2008) prolonged dummy use can be detrimental to the development of infants' ability to copy others' facial actions by limiting their opportunities for imitative face-to-face interactions. Therefore, practitioners could advise caregivers that if the infant is in a calm and attentive mood, ready to play, it is a good idea to put the dummy away.

FACTORS AFFECTING CAREGIVERS' FACE-TO-FACE PLAY WITH THEIR INFANTS

a) Stress

Given that play tends to be initiated in the absence of acute or chronic stress (Burghardt, 2011), infants growing up in a high-stress environment are more likely to be deprived of crucial face-to-face play experiences.

b) Maternal depression

A common factor impacting face-to-face interactions is maternal depression, which affects approximately one in ten new mothers (NHS, 2020). Depressive symptoms in both mothers and fathers have been associated with lower rates of play with the infant (e.g. Paulson et al., 2006). Furthermore, mothers with postpartum depression have been found to be less positive and less responsive during face-to-face interactions with their infant (Field, 2010). This has a negative impact on infants' attachment style (Bernard-Bonnin, 2004) and their ability to regulate emotions (Field, 1994).

c) Use of screens

Another recent development that may have a negative impact on caregiver-infant face-to-face interactions is the increased use of smartphones and tablets. Recent studies have found that parents distracted by their mobile device show reduced levels of responsiveness

and sensitivity to their children (see Kildare & Middlemiss, 2017, for a review).

IMPLICATIONS FOR PRACTICE

- Practitioners can assist parents in reducing the stressors affecting their family life which will free up resources to engage in playful face-to-face interactions.
- Besides referring parents with suspected postnatal depression to their GP to arrange appropriate treatment, practitioners may also want to support parents by encouraging face-to-face play with their infant. Recent studies suggest that face-to-face play-based interventions focussed on enhancing maternal sensitivity can have positive effects on the infant (Jung et al., 2007) as well as maternal mood (Salo et al., 2019).
- Practitioners may want to start conversations with caregivers about their use of mobile devices and to encourage them to consider putting their mobile devices away when they play with their infant.

SUMMARY

The studies reviewed in this article suggest that face-to-face play between infants and their caregivers during the first months of life has a key role in the development of important social cognitive abilities. By making eye contact, smiling, and talking to their infant during playful face-to-face interactions, caregivers can help their infant develop a sense of turn-taking and facilitate secure attachment. Furthermore, by copying their infants' actions and facial expressions, caregivers provide infants with a 'social mirror' that allows them to develop their sense of self and to learn about their actions and emotions. Together, these earliest forms of communication between the caregiver and the infant provide the foundation for the development of social communication, a secure attachment, the sense of self, and mimicry.

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