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INTERSUBJECTIVITY AND THE DOMAINS OF SOCIAL
INTERACTION:
PROPOSAL OF A CROSS-SECTIONAL APPROACH

Intersubjectivity is a concept central to human interaction, broadly understood as the sharing of minds. There is a rich diversity of conceptualizations of intersubjectivity, but detailed operationalization for its component processes in social interactions are scarce. We propose a novel approach to examine detailed variation in intersubjectivity in interaction. Our approach combines two previously formulated frameworks: the hierarchically organized developmental levels of intersubjectivity put forth in the field of developmental psychology, and three domains or orders of social interaction – affect, deontics, and epistemics – discussed in conversation analytic research literature. The interdisciplinary integration of these two frameworks allows a more crystallized view of intersubjectivity, which will benefit our understanding of the fine-scale social interaction processes as they vary in the course of the moment-to-moment unfolding of social action, across different stages of human social development, and between individuals belonging to different clinical groups and even to different species.

Key words: social interaction, affectivity, intersubjectivity, deontics, epistemics

Introduction

Intersubjectivity is often highlighted as the crucial difference between humans and nonhumans. Consequently, intersubjectivity is of major interest in philosophy, cognitive neuroscience, psychology, linguistics, and human evolution (e.g., Crosley, 1996; Praetorius, 2010; Rochat, et al., 2009; Tomasello and Rakoczy, 2003) – let alone in research on social interaction, language,

and communication (Fusaroli, et al., 2014; Heritage, 1984; Schiffrin, 1990). Yet, there is a lack of an agreed-upon operationalization of its component processes in social interactions at a detailed level. In this paper, we formulate a synthesis of two views on intersubjectivity that thus far are dealt with in separate fields of research: adult interactions in conversation analytic research, and developmental psychology research on the development of infant interactions. While they are not always seamlessly compatible in terms of conceptualizations of intersubjectivity (see below), we believe that synthesizing certain elements in these approaches will yield beneficial insights into intersubjectivity that have wider applicability.

In what follows, we will first very briefly discuss various conceptualizations of intersubjectivity. Then, we will summarize the developmental psychology view on intersubjectivity, more specifically by using the oft-used levels of intersubjectivity, formulated as a hierarchical, nested structure based on the early human infant development (Rochat, et al., 2009; Trevarthen, 1998; Trevarthen & Aitken, 2001). We will briefly review the central cognitive and emotional processes at each developmental level (for longer treatments, see e.g., Rochat, et al., 2009; Zahavi & Rochat, 2015). Thereafter, we discuss the second approach, which deals with three domains of social interaction, which have been previously discussed from the conversation-analytic viewpoint, with a specific focus on the interpretation of action in interaction (Stevanovic and Peräkylä, 2014) but which will now be applied to discuss intersubjective processes more generally. Then, we intersect the “level” and “domain” approaches to outline what we consider as the core processes of intersubjectivity. The synthesis of these two frameworks will benefit our understanding of the fine-scale social interaction processes as they vary in the course of the moment-to-moment unfolding of social action, across different stages of human social development, and between individuals belonging to different clinical groups and even to different species. Our central thesis is that intersubjectivity is not a monolithic phenomenon but a synthesis of different components, each of which may be present to a greater or lesser extent during a single interaction episode. Identification of this variation yields a better understanding and a more concrete description of the otherwise somewhat intangible notion of intersubjectivity.

What is Intersubjectivity?

Intersubjectivity as a notion has been used in many different fields of inquiry: sociology, philosophy, psychology, and anthropology, where it refers to the inherently social nature of human existence. While all conceptualizations of intersubjectivity involve a characterization of the relationship between Self and the Other, the literature enables us to identify different foci of emphasis regarding the main locus of intersubjective processes.

According to some conceptualizations of intersubjectivity, it appears as a *transpersonal phenomenon*. Intersubjectivity refers to the field of primordial, maternal reality, which has been conceived of as an “all-engulfing continent” in relation to subjective experience; “it is the experience of a welcoming, nourishing soil, in which otherness emerges as a constituent of subjective experiences, not through opposition or confrontation but through its character of primordial inclusion” (Coelho & Figueiredo, 2003: 199). Here, the starting point for the consideration of intersubjectivity is the total indifferenciation between Self and the Other. Heidegger (1962 [1927]) talked about us being thrown into a form of implicit understanding of the world, where we have no choice. This implicit understanding, which is always made up of our different subjective experiences and our possibilities for interpreting the objects with which we come in contact, ends up constituting us in the context of a tradition. In this sense, we always live under the control of the impersonal – a field of possibilities that establishes and delimits the conditions of our experience and the possibilities of our actions. It is the tradition that precedes us and surrounds us, and it must be understood as something that makes me come to be what I am. From this point of view, intersubjectivity has been claimed to involve a mode of participation in the natural and material world that does not even require an immediately perceivable human presence (Duranti, 2010; Schutz, 1962). Our perception of the world is something that human presence and human labor has already transformed into a “cultural world.” In a similar vein, Merleau-Ponty (1962) emphasized the primordial nature of bodily interactions, describing how we predate any earliest aspect of self-awareness, so that we find ourselves immersed in interactive and intercorporeal processes already before any primordial forms of social understanding take place (Gallagher, 2011: 65).

While intersubjectivity is necessarily learned through interactions with other people, all this is afforded by the developing brain capacity and the inherently social predispositions that allow the learning. Thus, in traditional developmental and comparative psychology, intersubjectivity has been typically considered as an *intrapersonal phenomenon* – an emergent property of the emotion-cognitive capacities of the developing human mind, of which some are present already in neonates. For example, there is much literature emphasizing the born-with tendency of human neonates to orient to faces and interact with others through smiles and vocal exchanges (e.g., Csibra, 2010; Rochat, et al., 2009, Rochat & Passos-Ferreira, 2009; Trevarthen, 1979). As these tendencies get fed by repeated interactions, they build the sense of intersubjective understanding through shared experiences. According to the so-called bodily mimesis argument (Zlatev, 2008), these primordial forms of intersubjectivity ground the development of language, which in turn boosts the development of intersubjectivity to even higher levels. Hence, at the same time as the development of intersubjectivity is strongly dependent on early social

interactions (see especially Reddy, 2003; Rochat, 2007; Rogoff, 1999; Vogel, et al., 2002), the intrapersonal perspective to intersubjectivity is centered around those primordial human social capacities that precede the structures of social interaction.

In yet other conceptualizations of intersubjectivity, the phenomenon is seen, not as the precondition for the interpersonal sphere to emerge, but rather, as those very interactional processes in and through which the interpersonal sphere is brought publicly into being. Here, intersubjectivity refers to the field of relations constructed in and through the interactions between individuals and may thus be considered as an *interactional phenomenon* – even if, paradoxically, individuals’ taken-for-granted assumptions about an already existing intersubjectivity play a major role in helping them to actually achieve it (Rommetsveit, 1976: 204). Within this conceptualization, we may further distinguish between two different ways of emphasizing the interactional processes most relevant for the achievement of intersubjectivity. First, from the perspective of enactivism, intersubjectivity is achieved in and through a dynamical interactional process of coordination where the resulting *emergent patterns of coordination* acquire meaning over and above the meaning of the individual actions (De Jaegher & Di Paolo, 2007; Fuchs & De Jaegher, 2009; Gallagher, 2011; Gallagher & Hutto, 2008). In this view, any interactional behavior by which participants coordinate or co-regulate their individual interactional contributions renders itself to the analysis of intersubjectivity (see e.g., Condon, 1979; Issartel, et al., 2007). Second, from the perspective of ethnomethodology and conversation analysis, intersubjectivity is achieved in and through *a set of commonly used normative practices* by which actions and stances can be composed in an intelligible way (Heritage, 1984; Rae, 1994; Schegloff, 2007; Wilkinson, 1999). In this view, social interaction is embedded in what Goffman (1983) referred to as the “interaction order” – the relatively stable regularities and structures of social interaction, which should be treated “as a substantive domain in its own right” (Goffman, 1983: 2).

As seen above, all conceptualizations of intersubjectivity involve, not only a characterization of the relationship between Self and the Other, but also a view of the type of processes that, in each case, underlie that relationship. These different approaches may on the outset appear rather incompatible. Yet, we argue they do not have to be. In this paper, we will mostly resort to the interactional conceptualization of intersubjectivity, including both the “processual” and “structural” emphases found in the literature (see De Jaegher, et al., 2016). We selected this perspective because our aim is to aid future empirical research by describing observable indicators of intersubjectivity, while also outlining a possible bridge between human adult interactions and interactions with human infants. At the same time, however, we maintain that the interactional processes that underlie the achievement of intersubjectivity are deeply rooted in individuals’

emotional-cognitive capacities, such as Theory of Mind skills, and we are therefore particularly interested in how these capacities become manifest at the level of social interaction. Thus, our account also draws strongly from the developmental psychological literature, where intersubjectivity is largely discussed with reference to its intrapersonal characteristics. Furthermore, some other aspects of our framework, such as the one highlighting the role of language in shaping individuals' intersubjective orientations (see below), also align with the idea of intersubjectivity as a transpersonal phenomenon.

The levels of intersubjectivity

In a framework used in cognitive and developmental psychology literature, intersubjectivity is organized into a sequence of levels of increasing cognitive and interactional sophistication (Rochat, et al., 2009; Trevarthen, 1979). Intersubjectivity is dependent on the increasing cognitive capacities of the developing child; thus, developmental psychology traditionally views intersubjectivity as an intrapersonal phenomenon. Differing from this traditional view, many authors emphasize that the development of interactional cognition is inextricable from social interactions all through the development (e.g., Reddy, 2003; Rochat, 2007; Rochat & Passos-Ferreira, 2009; Rogoff, 1999; Vygotsky, 1978). However, these views need not necessarily be incompatible because in both accounts, the developing intersubjectivity results from bidirectional interaction between a subject's emotional and cognitive capacities and the social interaction processes that shape them.

Human babies are socially oriented already at birth. Neonates display preference for faces, animate objects, and familiar voices (Rochat and Striano, 2000; Trevarthen, 1998). Neonates are also susceptible to "emotional contagion" (Hatfield, et al., 1994) in the form of contagious cry (Sagi and Hoffman, 1976; Dondi, et al., 1999). Some actions, including mouth and finger movements, are mimicked (Meltzoff and Moore, 1977; Nagy, et al., 2005), although the existence of this tendency has recently been challenged (Oostenbroek, et al., 2016). The apparently born-with dispositions to attend to faces and to orient and copy others' emotions and movements reflect the social attunement to others right from the birth (Trevarthen, 1979; Trevarthen and Aitken, 2001). Building on these predispositions, *primary* intersubjectivity emerges from ca. 6 weeks of age onwards. Infants respond to others' communication rhythmically and coordinate their own actions multimodally (Rochat, et al., 2009; Trevarthen and Aitken, 2001). At 2 months, social smiling, rhythmic turn-taking in vocalizations and shared mutual gaze (Gergely and Watson, 1999; Stern, 1985) are provoked and supported by affective responses by a caretaker's use of "motherese" and exaggerated facial expressions (Gergely and Watson 1999; Rochat 2001). Infants monitor the other's responses to their gaze, limb movements, and emotional expressions, while

the exact amount of expected responsiveness depends on the general levels of social contingency that the infant is used to (Bigelow and Rochat, 2006). Notably, infants actively try to re-engage a previously engaged but now withdrawing adult interaction partner by using vocal, gestural, and facial communication, as shown by the still-face paradigm (Melinder, et al., 2010; Messman, et al., 2009; Tronick, et al., 1978). Moreover, during primary intersubjectivity infants already show anticipation of another's actions: e.g., when mothers approached their infants to pick them up, they responded by increasing body tension and reaching out their arms (Reddy, et al., 2013). This may be understood as a basic form of understanding intentions, in the sense of intentions being perceivable and becoming manifest in goal-oriented action, which might play a role in the further development of understanding and attributing intentions as mental states. At this early stage, infants may also have an affective, non-representational account of self in the sense of being an object to others. This is arguably visible in infants' coy behavior in response to interaction with familiar adults or seeing self in the mirror (Reddy, 2000). In sum, building on the strongly social predisposition endowed before birth, in primary intersubjectivity infants and caretakers are interacting in a dyadic frame, in which they attend to and regulate each other's emotions and communicative expressions.

However, infants might not only anticipate other's actions directed at them, thus arguably showing a basic awareness and understanding of intentions as perceivable in action. Recent research into the emergence of Theory of Mind suggests that an implicit account of another's belief-like states may be present already at this early stage, i.e., that infants distinguish situations of a protagonist having a false versus a true belief (Low and Perner, 2012; Rakoczy, 2012; but see critique e.g., Ruffman, et al., 2012).

Nearing the first birthday, a child reaches the first stages of *secondary* intersubjectivity. Infants seek affective cues from the adult for how to respond in ambiguous situations, known as social referencing, which establishes the meaning of perceived things or events (Feinman, 1982; Striano and Rochat, 2000; but see for earlier emergence of social referencing: Vaillant-Molina & Bahrack, 2012). A child also begins to engage with another in triadic interaction about external objects in the form of joint attention. In joint attention, the infant and adult together focus their attention to an external object and gaze at each other in reference to the object (Striano and Rochat, 2000; Tomasello and Carpenter, 2007). Importantly, they keep track of the particular experiences shared with a person, point to share information of and to enquire about another's response to an object, and produce sharing looks in gaze alternation with the facial expression conveying their attitude to the object (Liszkowski, et al., 2006). Further, they elaborate and persist with their gesturing in the case of unsatisfactory response and take the adult's attentional state into account before pointing (Carpenter

and Liebal, 2011). Thus, at 12–14 months infants have the motivation and ability to share attention and interest with others towards a shared target and to engage in an emotionally satisfying interaction about this third pole of interaction.

At 18 months, infants complete others' uncompleted actions, marking the transition to collaborative action in the sense of shared intentionality – that is, to actions that are completed together with knowledge of the common goal (Tomasello, et al., 2005). When a joint action breaks down, 18-month-olds actively try to re-engage their partners in the shared task, even when the partner is not needed for the child to complete the action. Compared to the re-engagement during primary intersubjectivity, which occurs within the dyadic communication frame, in secondary intersubjectivity the re-engagement extends to activity that involves a shared, external goal and involves also a mutual knowledge of the sharing (Tomasello & Carpenter, 2007). Children do not view their collaborative partners merely as social tools for the achievement of their own goals, but rather, they enjoy the collaboration *per se* (Warneken, et al., 2012). Further, a child attaches rules to the ways reciprocal exchanges are to be acted and adjust them depending on whom they interact with (Zahavi and Rochat, 2015).

At 20–24 months, a child reaches *tertiary* intersubjectivity. Children gain understanding of self as a shared representation, being perceived simultaneously by oneself and by others (Rochat, et al., 2009). Children recognize themselves in the mirror (Johnson, 1983; Nielsen, et al., 2006), indicating an explicit self-recognition and self-objectification (Rochat and Zahavi, 2011). Joint attention develops further so that objects are not merely attended to but jointly evaluated via negotiation (Rochat, et al., 2009). Tertiary intersubjectivity also manifests in joint pretense play, which indicates that the child has access to symbolic references to possible worlds (Trevarthen, 1998). More complex self-conscious emotions, abiding to rules and testing them, and participating in jointly imagined games with others reveal the advanced cognitive potential and the keen motivation to partake in the conduct of the social world. Tertiary intersubjectivity thus allows an understanding of self in relation to others and as part of a larger social context. At this stage, children also reach an important milestone in intersubjectivity: they gain the command of language, which increases dramatically their control and use of communicative interactions.

Zahavi and Rochat (2015) group the later developmental achievements together with tertiary intersubjectivity. However, as they presumably require more advanced emotio-cognitive mechanisms than what is available for two-year-olds, we label an additional, *quaternary* level of intersubjectivity. By 6–7 years of age, shared intentionality has become collective intentionality (Tomasello, 2014). Children are highly sensitive to what others think of them, internalize group rules and norms, and apply them in their social interactions. Behavioral rules have a ritualistic quality: they are sanctioned by collective

norms (Zahavi and Rochat, 2015). Children identify with their group and employ ostracism and social rejection to affirm one's own group affiliation and identity (Nesdale, 2008). The quaternary level of intersubjectivity thus illustrates the child's motivation and capacity to interact as a part of a larger, normatively regulated group with collective norms and regulation thereof. Gaining a command of normativity is strongly manifested in and through language use, for example, in the form of narrative practice (Gallager and Hutto, 2008) or verbally explicated rules of behavior (Lagattuta, 2005).

A complementary view: Three domains of social interaction

As a complementary approach, we will consider three parallel domains of social interaction, characterized by *affective*, *deontic*, and *epistemic* aspects of participants' interactional behavior. The framework draws on an earlier proposal by Stevanovic and Peräkylä (2014), according to which the momentary relationship between the interaction participants can be described with reference to three different aspects of that relationship: affect, power, and knowledge, each of which pertains to the specific ways in which people may design their actions to be recognizable as such by others. Due to human adults arguably *orienting* to these three aspects of their momentary relationships as somewhat stable, predictable, and normatively accountable, the authors suggested that the organization of human action in general is embedded in three orders of social relations: emotional order, deontic order, and epistemic order. Here, we will apply the framework to discuss intersubjective processes more generally.

Although each of these three orders may be considered to be relevant to all adult human social interaction, the participants may still treat one of them as more salient than the other two. This tendency is reflected in many classifications in the philosophy of language. According to Bühler (2011 [1934]), there are three basic linguistic functions: expression, steering or appeal, and representation. Each of these functions may be argued to make relevant a different aspect of the participants' momentary relationship: expression the emotional aspect, steering or appeal the deontic aspect, and representation the epistemic aspect (Stevanovic & Peräkylä, 2014: 186). Bühler's categories also reverberate in Jakobson's (1960) idea of the phatic, conative, and referential communication functions and in Searle's (1976) thoughts about the expressive, directive, and assertive illocutionary speech acts. Furthermore, the three orders seem to agree also with Tomasello's (2008) theory, according to which all human social interaction is underpinned by three basic human communicative motives: sharing, requesting, and informing. In sum, it seems that the variance in the relative weights of the affect-, power-, and knowledge-related aspects of social interaction is a major motivator driving classifications of social action.

In this paper, we bring the three-order framework into discussion with the developmental psychological literature on the emergence of capacities for intersubjectivity. For this purpose, we will make certain modifications to the framework so as to adapt it to the analysis of interactions with human infants and children, where the norms and structures of social interaction are not yet (fully) oriented to by the participants (e.g., Stivers, et al., 2018). Essentially, we will draw on a combination of enactivistic and conversation-analytic ideas (see De Jaegher, et al., 2016) to outline a potential bridge between analyzing the emergent interactional processes, in which also human infants may participate in, and studying the normative structures of social interaction that inform human adult interaction. For this reason, we also refer to the three components of our framework as *domains*, and not as orders. In our vocabulary, the affective, deontic and epistemic aspects of interactional behavior and the respective orders of social relations are bound together by the notion of *orientation*. It is only when the participants begin to orient to certain patterns in the affective, deontic and epistemic aspects of their own and each other's behavior as normatively expected that the "domains" transform into "orders."

In the following, we will discuss each of the above-mentioned domains separately, while also revisiting and further elaborating those features of social interaction that were crucial in the previously described "levels" framework. In so doing, we will end up with a cross-sectional description of the intersubjective processes, in which we will differentiate various aspects of interaction across multiple levels and domains and which we hope to serve as a heuristic device in helping to navigate the complexity of intersubjective phenomena in future research endeavors.

Affective domain

According to Stevanovic and Peräkylä (2014), social interaction is anchored in what they refer to as the "emotional order," which consists of the "socio-cultural, personal, and local expectations concerning the expression of affect within a momentary relationship of interacting participants" (p. 192) and which can be used as a resource when designing one's utterances and expressions. Since we are, however, adapting the framework to the analysis of early human interaction, we will shift our focus from the already established normative expectations for emotional expression to those affective aspects of social interaction that play an important role in shaping the participants' momentary relationship locally. Repeated exposure to the patterns formed by these affective aspects of interaction will then, arguably, lead the developing human infant, later on, to orient to these patterns as more or less normatively expected – given the specific affective relationship context of interaction.

As reviewed above, research of human infants has long emphasized the importance of early affective resonance processes as a scaffolding for

the development of the individual's further intersubjective capacities. Emotional contagion (Dondi, et al. 1999; Sagi and Hoffman, 1976) has been suggested to affect the emotional experience of the mimicking person (Chartrand and Bargh, 1999). This is considered to happen independently of that person's cognitive ability to represent another's mental states (Barresi and Moore, 2008). It is thus "in the guise of emotional contagion" (Brinck, 2008) that we may observe the emergence of what Stern (1985: 132) referred to as "interaffectivity," consisting of an individual matching its own "feeling state as experiences within" with the feeling state "seen 'on' or 'in' another" (1985: 132).

Importantly, however, typically developing human infants have, not only the capacity to transmit and resonate with emotions, but also a fundamental desire to share their emotional experiences with others and to become swept along by the emotional experiences of others (Feinman, 1982; Hobson and Hobson, 2008; Meltzoff and Brooks, 2001; Reddy 2003; Rochat, et al., 2009; Trevarthen and Hubley, 1978; Trevarthen and Aitken, 2001). The early interaction of human infants and their caretakers takes place in an intense affective frame, where the participants engage in rhythmic, multimodal emotion displays, smile at each other and maintain mutual gaze (Gergely and Watson, 1999; Trevarthen and Aitken 2001; Rochat et al. 2009). Here, the heightened positive affect that often accompanies emotional sharing may increase the likelihood of, and desire for, further instances of such sharing (Hobson and Hobson, 2008; Messman, et al., 2009; Tronick, et al., 1978). The motivation to share experiences becomes even more apparent later in human ontogeny by the commence of triadic interaction, with the infants producing sharing looks, alternating their gaze between the co-participant and the object of interest, while expressing their attitude toward the object with their facial expressions (Hobson and Hobson 2008; Liszkowski, et al., 2006). The human extraordinary motivation to share experiences has been argued to underlie all the ensuing fundamental steps in the human intersubjective development (Stern, 1985; Tomasello, et al., 2005).

Affectivity also becomes socially regulated from early on. On a local scale, the social regulation of affect involves influencing the current affective state of the partner directly (e.g., sharing joy, soothing) (Stern, 1985; Tronick, et al., 1978). Importantly, however, such regulation occurs also on a larger scale, as infants learn to know about the opportunities and consequences of emotional sharing and develop relatively stable strategies, such as "attachments styles" (Ainsworth, et al., 1978; Bowlby, 1982 [1969]). For example, at 8–12 months, human infants begin to smile in anticipation of sharing an event with a social partner, thus indexing "an intersubjective sense of the social partner as someone with whom experiences can be shared" (Venezia, et al., 2004: 404). Overall, the social context has a facilitating or hindering effect on our wish to share emotions with others (Wagner and Smith, 1991; Zeman and Garber, 1996).

The development of the social regulation of affectivity goes along with the internalization of culture-specific rules on the appropriateness of different

kinds of emotional expressions in different social situations (Hochschild, 1979, 1983), and even in different locations within the moment-by-moment unfolding of interactional sequences (Sorjonen and Peräkylä, 2012). Thus, to give an example from adult interaction, the recipients of complaint stories and news deliveries are more likely to produce their emotional responses at the completion of the news delivery or narrative than immediately after the tellers' emotional displays (Maynard and Freese, 2012).

From a group-level perspective, the social regulation of affective sharing is needed, not only to avoid personal experiences of embarrassment, but also to manage social groups. There is evidence of an ingroup advantage in emotion recognition both in terms of decoding speed and accuracy (Elfenbein, et al., 2007; Marsh, et al., 2003), which suggests that emotional expressions play a significant role as indicators of membership and socialization in social units, such as teams, groups, communities, nations, and cultures (von Scheve, 2012). The heightened intersubjectivity in the form of "collective effervescence" (Collins, 2004; Durkheim, 2001 [1912]) is an incisive demonstration of the power of affective orientations as social glue binding a large group of individuals together.

Importantly, as will be suggested later when we explore the interplay between the levels and domains (see the next section), the social regulation of affectivity operates also through language. While the narrative practice allows humans to pass on judgments on how people should or should not behave in specific situations (Gallagher and Hutto, 2008), some of these judgments concern the matter of emotional expression in different situations. Language use thus accounts for the essential features of a uniquely human-like social order.

Deontic domain

What Stevanovic and Peräkylä (2014) referred to as the "deontic order" captures another aspect of the participants' momentary relationship that is, arguably, built-in in the organization of human action. This aspect has to do with power, control, and agency – the rights of an individual to determine action. Conversation-analytic research on the normative structures of human adult interaction is based on the idea of participants constantly posing constraints on each other's actions (Heritage, 1984: 245–53; Schegloff, 2007: 20–21). Still, the rights to do so may be distributed unequally, which is apparent, for example, in the pre-allocated turn-taking systems of certain institutional interactions, such as the ones in court or classroom (Atkinson & Drew, 1979; Macbeth, 1991). People also orient to asymmetries in their rights to make overt requests for specific future actions (Heinemann, 2006) or decisions about them (Stevanovic & Peräkylä, 2012). The deontic order thus is essentially about what an individual can rightfully expect from others and what others can from him or her, as well as about how such expectations may be established.

While the deontic order may be argued to account for certain phenomena in adult interaction, this is hardly true for interaction between young infants and their caretakers. Still, the first antecedents of deontic orientations may be seen to emerge early on. At 2 months, the early infant-caretaker interactions start to indicate contingency in the emotional expression (Rochat and Passos-Ferreira, 2009). For example, infants develop expectations of another's targeted movement (Reddy, et al., 2013) and accomplish interactional bids through smiles and eye-contact (Meltzoff and Moore, 1977; Rochat, 2001; Sagi and Hoffman, 1976). At 3 months, they begin to actively call others' attention to themselves, as it were, to initiate joint action (Reddy, 2003). At 4 months, when an adult tries to establish eye contact with the infant, the infant treats it as an invitation to joint action and expects that the adult's ensuing vocal, facial, and gestural moves will be of concern to him (Brinck, 2008). All this points to an emerging capacity of the human infant to predict the behaviors of others – something that, we argue, is the first step in the process of the infant also beginning to grasp how actions should unfold.

How does normativity then sneak in into early interaction? For a large part, this is accomplished by the caretaker, who treats the infant as if he or she were a competent interaction participant (Trevarthen, 1979). The caretaker may treat, for example, the infant's random hand movements as intentional and let it have a causal role in effectuating a change in the caretaker's subsequent behavior (Rączaszek-Leonardi, et al., 2013). Furthermore, when imitating the behavior of their infants, the caretakers have been found to exaggerate their behavior by using movement of the head and the face, thus possibly motivating the infant to produce further similar vocalizations (Nomikou and Rohlfing, 2011: 126; Papoušek and Papoušek, 1989: 149). As a result, jointly created interactional patterns emerge where the infants seem to be able to place their own vocalizations exactly at the right time and even at the right pitch (Malloch, 2000). It has also been well established that a rise in pitch in infant-directed speech makes it more likely that the infant shifts his or her gaze – a mechanism that may be used by the caretaker to solicit turn-taking (Papoušek, et al., 1991; Rossmanith, et al., 2014: 11; Stern, et al., 1982). In this way, regularities emerge from the interaction itself and these, in turn, constrain the way in which the next action is expected to take place. To use the terms of enactivism, the participants co-regulate their activity in ways that sustain the interaction itself, thus giving rise to a certain autonomy of interaction over the individual participants (De Jaegher and Di Paolo, 2007).

The co-regulation of activity is something that infants and their caretakers engage in repeatedly. Such co-regulation involves the sharing of excitement and enacting the structure, shape, and dynamics of joint action (Rączaszek-Leonardi, et al., 2013). As for the structural aspects of action, infants learn about the temporal patterning and “chunking” of actions into distinguishable events (Nomikou and Rohlfing, 2011), as well as about the ways

in which actions are chained into wider sequences of action (Rossmannith, et al. 2014). In moving through the joint action sequences together, infants get to know about the effects that their own actions have on the partner and the unfolding of the activity, and they learn to anticipate such effects (Hunnus and Bekkering, 2010). This opens up the way to “situational normativity” (Rietveld, 2008) associated with specific interpersonal routines and practices – repetitive “predictable formats of interaction” (Bruner, 1985: 31). Once established, the structures of joint action lend themselves to be played with, for example, for the purposes of teasing (Rossmannith, et al., 2014: 19). Gradually, over time, the routines develop into more conventionalized rituals (Bruner, 1985). By constraining interactions in less idiosyncratic ways, more complex forms of joint action with different constellations of participants not previously familiar to each other become possible (Rączaszek-Leonardi, et al., 2013: 216). Such development can be seen to culminate in the mastery of the complex conventionalized “interaction rituals” (Collins, 2004; Goffman, 1967) that characterize adult conversational interactions.

Research on adult interactions has shown that the expectations of behavior are not an innocent matter of probability but an issue permeated by morality: if the projected next action is not provided, it becomes morally accountable (Heritage, 1984: 245–292). The first instantiation of human infants orienting to the moral obligations of a person to fill those expectations that others have for their behavior may be observed very early on. From two months of age, infants have been observed to get upset when their caretaker’s face becomes unresponsive (Tronick, et al., 1978) or when their partner’s behavior shows little indications of contingency (Murray and Trevarthen, 1985). First, such expressions of distress may simply reflect the child’s personal preferences for certain actions over others (Darwall, 2006; Rakoczy, et al., 2008). It is only significantly later, at around three years of age, that there is evidence for children beginning to understand norms from a third-person perspective, in a more general and timeless manner; this is when children start to intervene in situations in which a third party is harmed (Vaish, et al., 2011). This is when they also start to demonstrate commitment to joint action that goes beyond their self-interest (Gräfenhain, et al., 2013; Hamann, et al., 2012), thus displaying readiness to fill the expectations that others have for them, independent of their personal preferences. About two years later, children have been shown to intervene when there is no concrete harm caused for anybody – just to set conventional norms right (Rakoczy, et al., 2008). This suggests that, by now, children recognize social norms to be general, agent-neutral expectations that represent an implicit agreement as to how one should behave (Tomasello and Vaish, 2013). Later, of course, children acquire a more nuanced grasp of the possible differences in how individuals may relate to specific norms (see e.g., Jordan, et al., 2014). Not everybody needs or has the right to behave in the same way – a differentiation that explains much of the hierarchies of power.

Expectation-based norms foreshadow morality also in the sense of an individual judging someone or some act as good or bad. Indeed, any disapproval of a harmful act or an approval of a cooperative act – especially when provided by a third disinterested party – may be argued to play a role in transforming an expectation-based norm into a moral norm. It is here in particular that deontic orientations are maintained also through language. As pointed out in the context of our discussion of affective orientations, narrative practice allows humans to pass on judgments on how people should or should not behave in specific situations (Gallagher and Hutto, 2008). Also, the mere language-afforded possibility of labelling chunks of behavior has been argued to invoke action-related rights and obligations for which people are explicitly accountable (Enfield and Sidnell, 2017). Language use thus plays an important role in enabling a relative stability of many deontic orientations in adult social interaction.

Epistemic domain

The so-called “epistemic order” consists of an “open-ended series of connections between people – connections that have to do with knowledge” (Stevanovic & Peräkylä, 2014: 188–189). These connections are constantly at stake when two or more people are interacting with each other. What we think others do and do not know informs the way we design our utterances and interpret others’ utterances as actions. As has been pointed out by conversation analysts, many actions, such as assessments (Heritage & Raymond, 2005) and complaints (Heritage, 2011), which apparently are not about knowledge, are still frequently performed in ways that put the participants in different positions vis-à-vis their knowledge about what is being talked about.

We suggest that the emergence of orientations to “knowledge” – that is, to a shared world of persons, inanimate objects and abstract concepts – is based on the co-regulation of action that also underlies the previously-discussed deontic orientations. More specifically, we postulate that as soon as children are capable of participating in action coordination that allows joint attention (Tomasello, 1999), the building of a shared world of knowledge may begin. However, the question when exactly this happens is a matter of some controversy. Experimental literature on gaze following and gaze checking suggests that infants’ epistemic orientations emerge by around 9 months of age, when they become referential beyond the dyadic exchanges, which happens, for example, when an infant points to a distant object to guide his or her caretaker’s attention toward it (Scaife and Bruner, 1975; Trevarthen and Aitken, 2001; Trevarthen and Hubley, 1978). Yet, literature focusing on multiple modalities, and not only on the visual domain, has indicated that joint attention coordination, at least in terms of experience sharing and mutual orientation, can occur much earlier than that. In a longitudinal study, Rossmanith and colleagues (2014) examined “book sharing” as one of

the earliest coordinated joint engagements with a complex object, occurring from as early as 3 months. As the researchers pointed out in their discussion of this finding, in book sharing, the triad between the infant, caregiver, and world is held together in a small confined space. The close encounters of book sharing allow the finger pointing and the object pointed at to meet within the infant's reach. Orientations to shared meanings for things and events emerge when the child's object-targeted actions are repeatedly embedded by the caretaker into culturally shaped episodes of joint intentionality (Rączaszek-Leonardi, et al., 2013).

There are various types of shared meanings for things and events, the development of which joint coordinated engagements enable. At least in the beginning, such meanings may be largely emotional, as evidenced in the empirical studies on social referencing, which have shown infants to be able to use the links between the emotional expressions of others and specific objects as a guide for their behavior (e.g., Hornick, et al., 1987; Walden and Ogan, 1988). Immersion into the structural dynamics of joint action then provides the opportunity for the infant to get a grasp of purposeful activities (Rączaszek-Leonardi, et al., 2013: 210–211), as well as of those very social agents who design these activities (Rossmanith, et al., 2014: 19). Furthermore, when two participants display joint attention toward a particular object, it is not only the object that becomes a part of the participants' shared world but also the particular way in which that object is being referred to. Thus, during the instances of joint attention, children have been argued to develop a capacity for dual representation, where communicative gestures stand for and become the sign of something else (e.g., a pointing gesture as standing for a thing out there to be shared with others) (Rochat, et al., 2009). According to this hypothetical idea, it is precisely the capacity of dual representation that opens the gate of symbolic development in terms of language acquisition (Akhtar and Gernsbacher, 2007; Smith, et al., 1988; Tomasello and Farrar, 1986). The new types of shared meanings afforded by language – including the abstract concepts, for example, for different states of knowledge and belief, for various actions and norms, and for rules of emotional expression – then drive not only the development of the full-blown epistemic order but also those in the deontic and affective domains.

The shared world of knowledge – the so-called “common ground” (Clark, 1996; Enfield, 2006; Stalnaker, 2002; Tomasello 2008) – is an essential precondition for any human-like social interaction. The common ground makes it possible for people to refer to persons, places, objects, and events in ways that allow others to recognize who or what is being talked about (Enfield and Stivers, 2007). Besides aiding referential communication, the common ground has important consequences in the realm of social relationships, where people attribute much value to the sharedness of information (Enfield, 2006). Consequently, epistemic orientations are crucial also from the point

of view of group-membership. Members of certain communities may treat their “ownership” of particular forms of knowledge as the defining characteristic of their community (Knorr-Cetina, 1999; Sharrock, 1974). From this point of view, children’s attempts in the triadic infant-adult-object encounters may be perceived primarily as attempts to create and expand that common ground (Tomasello, 1999) – something that, in the end, gives them something to talk about (Schaffer, 1984).

Summary: A synthesis of the levels and domains

The cross-sectional approach to the intersubjective processes in terms of a synthesis of the developmental levels of intersubjectivity and the three domains of social interaction is summarized in Figure 1.

	Affective orientations	Deontic orientations	Epistemic orientations
1 level	AFFECTIVE RECIPROCITY - Mutual gaze - Mutual smile - Shared dyadic affective interaction frame	EXPECTATIONS OF BEHAVIOR - Anticipation of other’s movements - Responding to other’s behavior - Attempts to re-engage other - Proto-conversation	INTEREST IN OTHER’S PERSPECTIVE - Gaze following - Implicit tracking of other’s knowledge / belief states
2 level	TRIADIC AFFECTIVE FRAME - Joint attention to share affective attitudes toward objects - “Declarative pointing” - Gaze alternation between the object and the other - Motivation to collaboration	GRASP OF NORMATIVITY WITHIN BEHAVIORAL EXPECTATIONS - Initiating and responding to initiations of joint attention - “Imperative pointing” - Give-and-take rule bound games	GRASP OF THE JOINT WORLD OF KNOWLEDGE - Social referencing - Joint attention to objects - Conventional object use - Separating between signs and what they do
	- Mutually shared knowledge of sharing	- Commitment to joint action	- Acquisition of language
3 level	GRASP OF PERSON-DEPENDENCY OF AFFECTIVE FRAME - Selectivity in sharing - Self-conscious emotions (embarrassment) - Joint affective attitudes to objects and abstract things	GRASP OF ASYMMETRIES IN ACCOUNTABILITY - Selectivity in obedience - Joint action with symmetric participation roles - Selectivity in enforcing sanctions and punishment as a third party	GRASP OF SELF-OTHER KNOWLEDGE ASYMMETRIES - Recognizing self as an object of knowledge for others - Orienting to asymmetries in access to knowledge - Joint pretense play - Representations of false beliefs
4 level	GRASP OF GROUP-LEVEL AFFECTIVE ORDER - Group identity - Emotions based on collective norms (shame, guilt) - Meta-representations of the affective order (“what can I share with whom?”)	GRASP OF GROUP-LEVEL DEONTIC ORDER - Sensitivity to group norms - Differentiation between group norms and generically binding norms - Meta-representations of power hierarchies in different areas of action (“who has a word to say in what?”)	GRASP OF GROUP-LEVEL EPISTEMIC ORDER - Management of reputation - Meta-representations of knowledge asymmetry (“who has access and the right to knowledge in different areas?”) - Creation of collectively imagined worlds

Figure 1. A schematic representation of the cross-sectioning levels and modules of intersubjectivity. The arrows indicate the flow of some important developmental directions that characterize neurotypical human intersubjectivity.

While the organization of the levels of intersubjectivity is hierarchical in that each level builds on an earlier one, the domains of social interaction are

more or less parallel, having their own distinctive characteristics. The affective domain is based on processes that lean onto the initial predispositions to social interaction and, while subject to cognitive and social regulation after early infancy, remain at least partly sub-conscious (e.g., emotional contagion in adults: Singer & Lamm, 2009). An essential characteristic of deontic orientation is that it is constituted by specific forms of action control that develop through concrete interactions and thus can only be learned in interactions with other people. The epistemic domain, then again, revolves around people's shared cognitive representations of their surrounding world. Despite their distinctive characteristics, we may assume that these three domains are not independent of each other but that they support each other in specific ways. The precise ways in which these, and potentially other, orientations exist in interaction and regulate one another, is a question that continues to be pursued (see e.g., Ekberg & LeCouteur, 2015; Landmark, et al., 2015; Lindström & Weatherall, 2015; Stevanovic, 2013). What is new here, however, is our proposal that there are crucial processes taking place on a third axis, i.e., a flow of influence running through the levels and domains *diagonally*. Initially, during the primary level of intersubjectivity, the direction of influence runs from the affective orientations toward the deontic orientations, and, from there, toward the epistemic orientations. That is, the affective scaffolding of interaction provides a framework where an infant may develop expectations as to how the other is going to behave next, while the capacity to anticipate other's reaction in turn is the foundation for the infant to be able to make bids of joint attention, which is crucial for the development of epistemic orientations. However, during secondary intersubjectivity, by the acquisition of language, the direction of the flow of influence changes: now it is the capacities in the domain of epistemic orientations, such as knowledge of who one is in relation to others, that drive the development of capacities in the deontic domain, where infants learn to adjust their normative expectations to take into account such knowledge. Furthermore, the increasingly detailed understanding of the norms that govern social life have an influence also on the orientation in the affective domain, so that the primitive reciprocity that characterized early interactions gives way to adherence to different kinds of emotion display rules. As a result, a mutual smile between a mother and a baby is quite different from a mutual smile, say, between Donald Trump and Angela Merkel – despite the apparent similarity of these two interactional events.

In our view, it is this particular right-angled-bracket (>) shaped pattern in the flow of influence between the different levels of intersubjectivity and domains of interaction that best accounts for the specificity and complexity of human intersubjectivity in interaction. As becomes obvious when considering the top-left corner of the table, affective orientations are the most central driving force behind all the intersubjective capacities and processes. After

a certain point, however, language, as a transpersonal “all-engulfing continent,” in which all of us are immersed (Coelho & Figueiredo, 2003: 199), takes on the role of equal importance (e.g., Zlatev, 2008).

Implications for research

After having proposed a novel approach to differentiate various aspects of interactional behavior across multiple levels and domains of interaction, we will suggest some ways in which this approach could benefit our understanding of the fine-scale social interaction processes and guide future research efforts.

First, the proposed approach helps to conceptualize the variation in the intersubjective processes in the course of the moment-to-moment unfolding of social action. Although all the domains and levels of intersubjectivity are presumably available for participants in mature human social interactions, particular aspects of intersubjectivity may dominate the interaction at a given point. For example, the domain of affective orientations may be emphasized during episodes of greeting and farewell, requiring either a very “low level” affect sharing or, depending on the context, cognitively more complex processing of affect that is selective and normatively regulated. As another example, the domain of deontic intersubjective orientations may dominate during complex collaborative interactions extending the constraints of the here-and-now among the participants, which again may involve cognitively more demanding processes of group norm sensitivity or power relationship representations or remain less cognitively taxing. In addition, our approach may help to account for instances of ambiguity in social interaction, which are particularly frequent at the intersection of domains of affective and epistemic orientations. The participants may, for example, have different understandings of whether an utterance, such as *That place is really far away*, should be heard as a delivery of new information and thus responded to with knowledge-oriented utterances (e.g., *Is it?* or *I know, I’ve been there*), or whether the same utterance should be interpreted as an affective evaluation and thus responded to with an analogous evaluation indicating the sharing of affect (e.g., *Indeed, it takes an eternity to get there*). Our approach will therefore help empirical interaction researchers to conceptualize the ways in which intersubjective orientations change from moment-to-moment in social interaction, while there may also be discrepancies in how the participants treat the centrality of a given domain for what the participants are momentarily up to. Furthermore, the suggested insights on the emergence of intersubjective orientations in early infancy may also contribute to a more nuanced understanding of how adult interactions are regulated – in particular with regard to the non-normative aspects of interaction.

Second, the synthesis of the “level” and “domain” approaches to intersubjectivity provides a unified framework to take a fresh look at empirical interactional data to consider how intersubjective processes actually develop. The above developmental account is based on the generally accepted milestones in development as seen in developmental psychology, while the details of the development may well vary both individually and culturally (e.g., Kärtner, et al., 2011; Keller & Otto, 2009; Reddy, et al., 2013). Moreover, the approach we propose can aid in yielding a more detailed understanding of intersubjective processes in individuals belonging to different clinical groups. Emphasizing the centrality of affective orientations, our model is well in line with literature on autism spectrum disorders (ASD), which points to a specific lack of emotional reciprocity that individuals with ASD experience in relation to each other and see it as an underlying mechanism behind the profound social impairments that define ASD (see e.g., Baron-Cohen, 1987; Hobson and Hobson, 2008; Hobson and Meyer, 2005; Kasari, et al., 1990). Notably, however, according to the so-called social motivation hypothesis, many of the social impairments evident in ASD are not fundamental but rather secondary to a primary impairment in social motivation, which results in failure to attend to and generalize representations of the reward value of social stimuli (Dawson, 2008). These views suggest that there are different mechanisms underlying and possibly influencing the development of ASD – something that fits well with the status of ASD as a highly heterogeneous group of disorders.

Third, our approach provides tools for the study of intersubjectivity in non-human animals. While intersubjectivity is widely considered as a uniquely human characteristic (see e.g., Tomasello & Rakoczy, 2003), our nearest living relatives, chimpanzees, exhibit impressive socio-cognitive skills and master many of the processes seen in human infants, so such a view may not be entirely warranted. Clearly, chimpanzees lack intersubjectivity as a language-mediated, collective, and norm-regulated process of interaction directly comparable to adult humans. Yet, they possess some of the capacities that mark the first three levels of human intersubjectivity in each domain. Chimpanzees’ affective orientations are arguably highly similar to that of humans in terms of emotional contagion (Kano, et al. 2016; Parr, 2001), and their early developmental stages have been claimed to be indistinguishable from that in humans (Bard, 2012). At the higher levels of affective orientations, whether or not chimpanzees engage in joint attention or not is debated (Carpenter & Call, 2013; Leavens, et al., 2005; Leavens and Racine, 2009). As for the deontic orientations, chimpanzees clearly exhibit behavioral expectations that take relationship attributes such as rank and friendships among group members into account (e.g., Slocombe & Zuberbuehler, 2007) and exceed rules learnt from interactions in specific pairings, including expectations of reward distribution and social conduct (Brosnan & de Waal, 2014; Rudolf von

Rohr, et al., 2015; for bonobos, see Clay, et al., 2016). Furthermore, and quite intriguingly, recent studies show that bonobos, a sister species of chimpanzees, engage in fast-paced communicative interactions organized in adjacency pairs (Rossano, 2013), and their gestural communicative exchanges resemble cooperative turn-taking (Fröhlich, et al., 2016). Still, generally, they have a weak or absent orientation to accountability in terms of third-party punishment, which clearly makes them different from humans (see Riedl, et al., 2012). Finally, regarding the epistemic orientations, chimpanzees know what others see and hear and this leads to the use of others as sources of information in ambiguous situations. While chimpanzees appear unable to understand others' explicit false beliefs (Call & Tomasello, 2008), they pass implicit false-belief tests (Buttelman, et al., 2017; Krupenye, et al., 2016), similarly to infants under two years of age (reviewed by Scott & Baillargeon, 2017). Altogether it is suggested that the differences in human and chimpanzee intersubjectivity appear to stem from the absence of a “we-mind” and, consequently, absence of a mindset of collectivity (Bullinger, et al., 2016; Tomasello, 2014; Tomasello, et al., 2005; 2012; Tomasello & Rakoczy, 2003), despite the early stages of affective, deontic, and epistemic orientations being to some extent comparable to those of humans. However, studies on primates as well as other species, such as dogs, wolves, and corvids, reveal that the boundaries between humans' and other species' intersubjectivity are increasingly blurry, and future research could point to new aspects in what distinguishes the intersubjectivity processes characteristic for humans from those of other species. We hope that the ideas proposed in this paper will prompt further research in this domain of inquiry, too.

Finally, the paper seeks to foster future efforts of interdisciplinary dialogue. We wish that our model will help researchers to grasp what aspects of social interaction different empirical research approaches are actually looking at and, as a result, to better relate these approaches to each other. In other words, we hope that the paper will also turn out to advance the processes of intersubjectivity – within academia.

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