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Language and the signifying object: from convention to imagination

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[It] is always difficult for the psychologist to think of anything ‘existing’ in a culture ... We are, alas, wedded to the idea that human reality exists within the limiting boundary of the human skin! (Bruner 1966: 321).

The body is our general medium for having a world ... Sometimes the meaning aimed at cannot be achieved by the body’s natural means; it must then build itself an instrument, and it projects thereby around itself a cultural world. (Merleau-Ponty 1962: 146).

Observation of O. at 2:4;5. Father goes to get him from the car seat. O. keeps his eyes closed, eyelids quivering slightly, with a slight smile. Then he opens his eyes and says “I’m sleeping”, laughing.

1. Intersubjectivity and the ontology of the social

This chapter has two primary aims. The first is to propose an account of the social nature of the shared mind. The second is to put forward arguments and evidence for regarding material objects, especially artefacts, as a crucial ingredient of intersubjectivity and its development. In this section we advance philosophical and psychological arguments for considering the shared mind to be fundamentally social. We critically assess the methodological individualism guiding the construal by most philosophers and psychologists of the notion of intersubjectivity, and propose an alternative construal of intersubjectivity which sees it as rooted in an *ontology of the social*, whose methodological counterpart is the Durkheimian concept of the “social fact”.

There are two fundamentally different ways to conceive of the “shared mind”. The first of these is predicated upon the foundational status of individual mental or representational content, and in particular of intentional states such as beliefs. An intentional state is characterized, as Searle (1983) puts it, by its directedness to whatever it is *about*. Intentional states can be about anything at all: object, event or process, real or imaginary, and hence can also be directed at other intentional states, whether those of the subject or that of another subject. I can, for example, wish that I had thought of an idea before someone else did, or I can believe that my next door neighbour believes in fairies, and so on. It is on this basis that “Theory theories” of intersubjectivity are constructed: intersubjectivity is considered to be a matter of

knowledge (or belief, or intentional states in general). On this account, intersubjectivity is essentially a matter of “common knowledge” in the sense of Lewis (1969) (see also Clark 1996; Itkonen this volume).

It is indisputable that normal adult human beings do indeed base much of their social reasoning on representations of other people’s mental states. There are also good arguments for viewing social institutions such as language as *objects of common knowledge* (Itkonen this volume). There are, however, at least three objections to regarding the “common knowledge” account as sufficiently foundational or inclusive to fully comprehend intersubjectivity. The first objection is logical. The “common knowledge” account is immediately vulnerable to Hume’s “Other Minds” problem: How can I know that the mental content that I ascribe to you is the mental content that you actually have, even excluding cases of mistaken or false ascriptions? In other words, if, for example, I (correctly) think that my neighbour believes in fairies, how do I know that whatever it is that my neighbour believes in is what I think they believe in? To know *that*, I have to be sure that what my neighbour’s mental content is about is *the same* as what my neighbour’s mental content *under my representation* is about. Without this guarantee of *referential* intersubjectivity, there can be no common knowledge. In other words, the “common knowledge” formulation of intersubjectivity presupposes, without explaining, the intersubjectivity of reference. Another way of putting this is to say that the “common knowledge” formulation presents an unsolved instance of the “Grounding problem”, which requires a *logically prior* appeal to intersubjectivity for its resolution (Sinha 1999).

The second objection to the “common knowledge” account is that intersubjectivity is as much about feeling as knowing. As has frequently been pointed out, intersubjectivity is closely connected to the capacity for empathic identification. However, the affective phenomenology of intersubjectivity extends beyond empathy, in that there are some states of feeling that are constitutively intersubjective, in the sense that they implicate the experience of the feeling of another directed towards oneself. For example, for a couple to be in love it is necessary for each to be in love with the other. The experience of being in love with a lover is quite different from the experience of being unrequitedly or disappointedly in love, for no other reason than the intersubjectively shared nature of the former, as contrasted with the forlornly solitary nature of the latter. Although knowledge of the other’s feelings is important

in this, knowledge is not all there is to it, since this intersubjective state also involves commitments and accountabilities—a quintessentially normative dimension that, we shall suggest, is fundamental to intersubjectivity and to the social domain in general.

The third (related) objection is that the “common knowledge” account of intersubjectivity is disembodied; it does not take into account the “intercorporeal” (Merleau-Ponty 1962) dimension of intersubjectivity, which manifests itself most clearly in the mimetic nature of primary intersubjectivity from the earliest stages of infancy (Zlatev this volume; Trevarthen 1979, 1998; Reddy *et al.* 1997). It is in the shared experience of corporeally expressed, emotionally rich states of the embodied mind that, as the French developmental psychologist Henri Wallon insisted, we should seek the roots of the intersubjective psyche (Netchine-Grynberg and Netchine 2002; Rodríguez 2006; Wallon 1984 [1925]; Zazzo 1975). We shall develop this argument further below, by demonstrating that intersubjectivity (and, by extension, institutions and conventions) also find material embodiment in artefactual objects.

Despite these briefly-sketched problems afflicting the “common knowledge” account of intersubjectivity, it has been deeply influential, not only in philosophy of mind but also in developmental psychology. This is, firstly, because it accords with the tradition of reducing all realities existing “between” people to theories about what goes on “inside” individual minds; and secondly because it also accords with the mentalist emphasis in classical cognitivism on the primacy of mental representation. The ontogenetic version of this account seeks its explanation for certain representational capacities of the adult mind—the ability to represent representations—in the autonomous domain of representation itself. Whether “theory of mind” is proposed to be a consequence of meta-representational abilities first applied to the child’s own cognitive processes, or of an ability to “read” the intentions of others, the basic assumption of the paradigm remains in place: “mind” is an autonomous domain, and actions are secondary to the internal and private intentional states which they reveal.

We turn now to the second, very different, conception of the “shared mind”, which has its roots in Durkheimian social theory. The object of social theory, for Durkheim, was the domain of *social facts*, which he described as “a category of facts which present very special characteristics: they consist of manners of acting, thinking,

and feeling external to the individual, which are invested with a coercive power by virtue of which they exercise control over him.” (Durkheim, 1982 [1895]).

Social facts, for Durkheim, are not merely aggregates of the individual representations of them by the subjects that are regulated or “coerced” by the social facts, since for each individual subject the social fact presents itself as a part of an out-there *objective* reality. The objectivity of social facts consists in the fact they are independent of any single individual’s thoughts or will. As Jones (1986: 61) puts it, “it is precisely this property of resistance to the action of individual wills which characterizes social facts. The most basic rule of all sociological method, Durkheim thus concluded, is *to treat social facts as things*.” Durkheim’s treatment of social facts thus consists in, first, an ontological proposition, that social facts are irreducible to biological or psychological facts (or structures or processes); coupled with, second, an epistemological and methodological proposition regarding their treatment: as *objects* rather than ideas, and as particular *kinds* of objects, whose determinate nature consists in their “coercion” of conduct.

Durkheim has often been criticized for the breadth and vagueness of his notion of “social fact”. A particularly problematic aspect of his theory is that, in counterposing “social facts” to “individual conscience” (or mind), he sometimes identified the former with “states of the collective conscience”. Some social psychologists (e.g. Moscovici 2000) have followed this direction in constructing a theory of “social representations”, but critics have claimed that Durkheim sympathized with a view of society as a kind of super-organic “collective personality”.

Whether Durkheim believed in a “collective mind” or not, such a construction is not only scientifically untenable, it is unnecessary. We propose that a social fact can most simply be defined as something regulating an aspect of conduct which requires the *participation* (Goodwin and Goodwin 2004) of more than one individual. This “something” may be a codified law, a norm, an institution, a rule in the Wittgensteinian sense, or a canon of interpretation. A natural language, therefore, qualifies as a social fact (indeed, as a social institution, see Itkonen this volume) under this reading of Durkheim’s theory.

Let us now compare and (if possible) try to integrate Durkheim's account with the "common knowledge" account. Social facts (like any other "facts") are potential objects of intentional states. Individual beliefs *about* social facts (like any other beliefs) are also potential objects of intentional states (and hence of common knowledge). The efficacy of at least some social facts depends upon their being the objects of common knowledge (Itkonen this volume). However, claimed Durkheim, the social fact itself is not the sum, average or common denominator of all the individual beliefs of all participants. Rather, Durkheim insisted, the social fact is in some sense prior to these individual cognitions. This is at first blush puzzling, since the collectivity of participants (or some authority amongst them) can, in principle, *change* the social fact (e.g. the rules of a game) just by so deciding.

To clarify this issue, let us compare Durkheim's view with that of Searle (1995: 1-2): "There are things that exist only because we believe them to exist. I am thinking of things like money, property, government, and marriages ... [such] Institutional facts are so called because they depend upon human institutions for their existence." Durkheim, we suggest, would have agreed with the second, but *not* the first, of these propositions of Searle. How can we render this difference intelligible?

The answer, we suggest, is to view social facts as constituting an emergent, normative ontological level existent *only* in the intersubjective field of *joint action* regulated by norms and commitments. Intersubjectivity is then essentially a matter of *co-participation* in joint action structures which, by virtue of their normative regulation, are conventionalized as *social and communicative practices*. Social practices, and the norms regulating them, can be objects of intentional states, including "common knowledge", but they are *not* reducible to the aggregates of such states.¹

Our account of intersubjectivity, then, accords priority to *co-participation, action and practice* over individual mental states, both logically and ontogenetically. Note that this priority does not *deny* either the existence of individual mental states, or the reflexive structure of common knowledge. Rather, it regards intersubjectivity as *essentially* social, and logically and ontogenetically *pre-requisite* to common knowledge. Indeed, we would argue that intersubjectivity is the fundamental condition of all social facts, a proposal which we suggests considerably clarifies

Durkheim's own formulations, while remaining true to his insight into the relative autonomy of social facts from psychological facts.

Our proposal can now be compared with the following argument for the existence and role of "collective intentionality" advanced by Searle (1995: 25-26):

The requirements of methodological individualism seem to force us to reduce collective intentionality to individual intentionality. [However] it does not follow from [the individual possession of intentional states] that all my mental life must be expressed in the form of a singular noun phrase referring to me. The form that my collective intentionality can take is simply 'we intend,' 'we are doing so-and so,' and the like ... the intentionality that exists in each individual head has the form 'we intend.'

Searle's argument, however initially appealing, faces the problem of where this primitive or *a-priori* "we" comes from. The answer that we offer is that it is the lexico-grammatical expression of *intersubjectivity*, deriving from joint action ("we are doing so-and-so"), regulated by the normative social fact that makes recognizable the joint action as an instance of the practice "so-and-so". Searle (who fails to reference Durkheim) goes on to write (*ibid.* p. 26):

I will henceforth use the expression 'social fact' to refer to any fact involving collective intentionality. So, for example, the fact that two people are going for a walk together is a social fact. A special subclass of social facts are institutional facts ... for example, the fact that this piece of paper is a twenty dollar bill is an institutional fact.

It will be clear by now that, from our point of view, Searle's proposal puts the cart before the horse. We would maintain, rather, that collective intentionality is *based* upon, *not* the source of, participation in joint action in an intersubjective field, regulated by social facts (norms, institutions etc).

What empirical evidence does developmental science offer for the existence of an "ontology of the social", and how might this bear upon the difference between our account and Searle's "collective intention" account? The classic experiment by Murray and Trevarthen (1986), who showed that infants were able to distinguish between a real-time video-mediated (CCTV) image of their mothers, and the same image recorded on videotape, unsynchronized with the infant's own actions, is

extremely illuminating. The experiment, we would argue, provides strong evidence of the reality of the “ontology of the social” as such (both as social fact and as psychological reality); and of the biologically based readiness of very young infants to *participate*. The important thing about such participation, which distinguishes it from mere coordination on the basis of the “stimulus situation”, is not only the temporal sequencing and rhythm of the interaction, but also the subjective recognition of being *engaged in participation*—indexed by the different emotional reactions of the infants to the two stimulus situations.

Viewing primary intersubjectivity in terms of *participation* (as a social fact or process) has important consequences for developmental theory. The implausibility of attributing neonatal engagement to intentional mental contents has led some developmentalists to neglect the significance of primary intersubjectivity, and focus on secondary intersubjectivity (triadic joint attention) as the decisive achievement in the development of the shared mind (Tomasello 1999). We maintain, in contrast, that all later forms of intersubjectivity are predicated on primary intersubjectivity. It is, however, neither necessary nor correct to interpret the evidence for primary intersubjectivity in terms of “innate intentionality”, whether individual or collective. Rather, we prefer Trevarthen’s more recent formulation in terms of “motives for engagement”, while emphasizing that the constitution of engagement as *intersubjective* is effected as much by the structuring (by the caretaker) of participation, as by the biological predisposition and capacity of the infant to engage. Primary intersubjectivity, on this reading, is neither *merely* a psychological nor *merely* a biological fact, but a “proto-social fact” supported by human developmental psychobiology.

Furthermore, without denying the developmental significance of the sharing of attention and of other individual intentional states, our prioritizing of *participation in joint action* enables us to conceptualize, similarly to Rakoczy (2006), the primary inter-mental dimension of intersubjectivity as being a normatively regulated *commitment* to the activity itself (see also Shotter 1978, 1995); and prompts us to re-examine the significance of the *objects* which in some sense “carry” or signify such norms and conventions.

2. The object as a social-material signifier

Intersubjectivity is often conceived mentalistically, as a property of the “unmediated mind”. We reject the idea that intersubjectivity is to be considered as equivalent only to “inter-mental”, in that we stress that inter-corporeality extends beyond the body to encompass objects. Intersubjectivity is materially grounded in embodiment, and this embodiment extends “beyond the skin” to encompass its mediation by objects, or what we shall call *inter-objectivity*. Such mediation, we propose below, can be regarded as the ontogenetically first manifestation of semiotic mediation.

We proposed above an account of intersubjectivity in terms of *co-participation* in joint action structures which, by virtue of their normative regulation, are conventionalized as *social and communicative practices*. This definition excludes actions which may be directed towards others, but which are not framed as part of an activity governed by a norm. It also excludes solitary activities which may be governed by norms of performance or of achievement, such as gardening or cooking a meal, which may properly be termed social practices, but which (when performed alone) do not involve social interaction. It includes both semiotically mediated discursive practices such as talking and gesturing, and socially organized non-discursive practices such as co-participation in games or in physical constructions.

Primary intersubjectivity in infancy is a mode of co-participation in which the body of the infant is not so much the “vehicle” or “medium” of engagement, as the very engagement itself. Primary intersubjectivity is *embodied* in the strongest sense of the word. In semiotic terms, there is no distinction between the bodily movement as signifier, and the signified “meaning” that is communicated, between the inter-mental and the inter-corporeal. There is also, as yet, no differentiation between discursive and non-discursive co-participation.

Inter-corporeal co-participation is not supplanted in development, but is elaborated and extended by *semiotic mediation*, most obviously in discursive practices employing conventionalized gesture and language. In this section, we explore the neglected role of *objects* (especially artefacts) in the constitution of intersubjectivity and subjectivity. The neglect stems not so much from a failure to recognize that the material world is an important dimension of co-participation, as from the tendency to downplay its semiotic status and regard it as mere “context” to language. Goodwin

and Goodwin (2004: 222), for example, define participation as “actions demonstrating forms of involvement performed by parties within evolving structures of *talk*” [our italics], although they also recognize the need to “expand our notion of human participation in a historically built social and material world” by attending to “material structure in the environment” (*ibid.* p. 239). Our purpose in this section is to foreground the semiotic aspect of materiality, and to analyze its role in the development of intersubjectivity and normativity.

We owe the notion of semiotic mediation to Vygotsky, whose explanation of its operation in cognition, and in cognitive development, focused on the internalization of conventional signs originating in contexts of discursive practice. Although Vygotsky attributed great importance to the formative role of language in the emergence of “inner speech” and “verbal thought”, his employment of the concept of semiotic mediation also encompassed the use of non-systematic signs, including objects-as-signifiers. One of his most celebrated examples of semiotic mediation is that of a mother tying a knot in the handkerchief of her child, to remind him of the need to convey a message to the teacher—a social practice which was widespread, not only in Russia, until quite late in the 20th century. Vygotsky writes:

When a human being ties a knot in her handkerchief as a reminder, she is, in essence, constructing the process of memorizing by forcing an external object to remind her of something; she transforms remembering into an external activity. This fact alone is enough to demonstrate the fundamental characteristics of the higher forms of behaviour. In the elementary form something is remembered; in the higher form humans remember something. (Vygotsky 1978 [1930]: 51)

The semiotic value of the knot is conventional, not by virtue of the knot being an element of a sign *system*, but because it is normatively framed by a social practice of “reminding”. It is this frame of practice which underpins the meaning signified by the knot on any given occasion, constituting the semiotic status of the knot as an example in miniature of what Searle (*op cit.*) calls an “institutional fact”.

Vygotsky’s knot in the handkerchief, and Searle’s twenty dollar bill, are thus both institutional facts; and both are exemplars of the *material* semiotic mediation of social practices—the exchange of respectively information and goods. We may note

both similarities and differences between the two cases. First, the similarities. There is no intrinsic property of the material substrate (cotton, paper and ink) which determines the semiotic or monetary value of the token, which is conventionally determined. Hence, the token is equivalent, for purposes of use, to any other type-identical token, which need not be made of the same material (a piece of string round the wrist, an electronic credit on a chipcard). This independence of semantic or monetary value from material substrate is, of course, a fundamental property of signs, a mark, as it were, of the domain of semiosis or signification.

Now we may note the differences between the knot and the twenty dollar bill. If the monetary token is materially destroyed, the value that it signifies is also destroyed, whereas if the knot is untied, the information it signifies is not. The twenty dollar bill is “cashed out” or used up (for the purposes of the user) once exchanged, since it passes from the ownership and control of the user. However, its monetary value is preserved until it is withdrawn from circulation. Conversely, the knot can be “used” again by the user to recall another, different message, while the message signified by the knot no longer has any utility or communicative value once it has been exchanged. Finally, while it makes sense to say that the knot “stands for” the message, the twenty dollar bill does not “stand for” (say) twenty one-dollar bills, but is exchangeable for or *equivalent* to them. All these differences can be summed up by saying that while the knot is a *sign* of the message, the twenty dollar bill *is* its monetary exchange value, it is self-identical to that value. Nonetheless, although the twenty dollar bill is not a *sign*, its self-identity to its monetary exchange equivalents is not physical, but social and semiotic.

Searle’s account of social or institutional facts (such as money) is that they depend upon collective agreement and knowledge that, under determinate rules, something *counts as* an instance of a social object. Hence, the general form of such rules is:

“X counts as Y in context C” (Searle, 1995: 28).

Note, here, that this definition is wider than, but subsumes:

“S (a sign) stands for M (a message) in context C”.

For example, we could say that Vygotsky’s handkerchief *counts as* a sign for a message in its context of use, and the “standing for” relationship obtains between the

handkerchief and the specific message in context C. So, on this interpretation, the sign relationship can be expanded into:

“X counts as S, and S stands for M, in context C”.

The distinction between the “counts as” and the “stands for” relationship can now be used to distinguish between the grammatical acceptability and the semantic interpretation of a sentence (Itkonen this volume):

“James eats meat” counts as a correct sentence in English, and stands for the proposition that James eats meat in context C.

Note, now, that it is also in virtue of the combination of its formal arrangement and its context, that the sentence “James eats meat” *counts as* an assertion of the proposition; the sentence does not “stand for” the assertion, rather the act of uttering it in a particular context *is* that assertion, just as Searle’s twenty dollar bill *is* the twenty dollars, rather than standing for it. Hence, both the grammaticality and the illocutionary force of an utterance are aspects of what the utterance *counts as* (being) in its context, while its semantic interpretation is the interpretation that it *stands for*, in that same context. All of this is irreducibly normative, and it is this duality of normative structure, of “counting as” and “standing for”, that underlies the *conditions on representation* that are analyzed by Sinha (1988: 37): “To represent something ... is to cause something else to stand for it, in such a way that both the relationship of ‘standing for’, and that which is intended to be represented, can be recognized.”

The fact that the “standing for”, or sign relation, is embedded in the “counting as”, or institutional relation, makes it clear why language must be viewed as primarily a social institution (Itkonen this volume). A formal account of the relationship between “counting as” and “standing for”, and a demonstration of how this formal account is congruent with Itkonen (this volume) can be found in the Appendix at the end of this chapter.

This account might suggest, too, that the institutional “counting as” relation is somehow cognitively simpler than the sign relation. This cannot be the case without qualification, since coined money was only invented in the period of 800-600 BCE, in Greece and China, at a time when we have ample evidence of written language. Indeed, Sohn-Rethel (1977) argues that it was the invention of coinage which

simultaneously brought into existence generalized commodity production and the very notion, fundamental to logic, of abstract equivalence and purely formal (non-) identity. Sociogenetically, then, institutional semiotic forms have continued to be historically elaborated along with symbolic forms (Sinha in press).

Ontogenetically, however, we shall argue that the normative understanding of “counting as” precedes the development of language. To make this argument, we briefly cite Searle once again, who points out that: “in order that something be a chair, it has to function as a chair; and hence, it has to be thought of or used as a chair. Chairs are not abstract or symbolic in the way that money and property are, but the point is the same in both cases.” And the point, of course, is normative. Note that Searle characterizes money as *symbolic*, a terminological characterization that we have resisted, but we can certainly agree that it has a *semiotic* dimension; that is, the structure of “counting as” is inherently semiotic as well as social.

Let us examine more carefully the semiotics of material artefacts. Now, *anything* can be *used* as a chair, provided it has the affordances, in the sense of Gibson (1979), that permit it to be sat in or on. Such affordances are part of what Searle calls the “brute” or “natural” facts, as opposed to institutional or social facts. Is there, however, any sense in which something can be said to properly “count as” a chair in Searle’s sense of an institutional fact? The answer, we suggest, is yes: an object *counts as* a chair if it is an artefact intended and designed to be used as a chair. The physical properties of the chair are then no longer merely “brute facts”, but socially constructed and normatively regulated affordances, which make possible the *canonical function* of the chair. The canonical functions of artefacts are therefore *social facts*, and the material world of artefactual objects is not one only of “brute facts” in their physical aspect, but *also* one of social meaning.²

We conclude that, in analogous fashion to the way that the twenty dollar bill signifies (without *standing for*) its normative identity as a representation of exchange value, the artefactual object (such as a cup, a chair, or a computer) signifies its normative canonical function or use value. Objects, then, not only (as with Vygotsky’s handkerchief) can be signs for something else, but, when they are artefacts, as most objects we encounter in our everyday lives are, are signifiers of their proper, socially standard, canonical functions in a context of social practices.

Of course, a condition for the semiotic status of artefacts, as with any semiotic status, is that human subjects are capable of cognitively grasping it. As Searle says, for a chair to function as a chair, it has to be used as a chair and thought of as a chair. When do human infants begin to display such a cognitive grasp, and where does it come from?

3. Early object use and exchange: canonicity and normativity

In a series of experiments Walkerdine and Sinha (1978), Freeman, Lloyd and Sinha (1980), Lloyd, Sinha and Freeman (1981), Freeman, Sinha and Condliffe (1981), and Sinha (1982, 1983) investigated infants' and young children's understanding of object function, using infant search, action imitation and acting-out language comprehension paradigms. In an age range from 9 months to 3 years and 6 months, they found error patterns which were characterized by "canonicity effects". Infants at the end of the first year of life were more successful in A-not-B search tasks (otherwise known as object permanence tasks) when the object was hidden in an upright than in an inverted cup. It seems that these infants understood that a cup is a "better" container when in an upright orientation than when inverted. Slightly older infants were generally unable to imitate the placement of a small block on the bottom of an inverted cup, preferring to turn the cup back into an upright orientation and place the block inside the cup. In this response strategy, the infants showed that they were "locked" into a normative apprehension of the cup as a canonical container, which over-rode the "brute" affordance of the flat surface of the bottom of the inverted cup. Even after this response strategy disappeared in action imitation tasks, it re-appeared in language comprehension tasks: for example two year olds, when asked to place a block "on" an inverted cup, turned it to the upright position and placed the block inside it.

These experiments can be interpreted as showing that, in the first place, objects are cognitively apprehended by infants, from an early age, in terms of their socially-imposed, normative and canonical function (the object "counts as" a container). In the second place, the emerging conceptualization of spatial relations *between* objects is also derived as much from the canonical functional relations which objects contract with each other as from purely perceptual-geometric information (for a discussion of the functional basis of spatial relational meaning, see Vandeloise 1991).

Where does this understanding, on the part of the infant, of the canonical function of objects come from? This question is important, because of the intimate relationship between the physical properties of the artefact, and its socially “baptized” canonical function. In contrast with, for example, the monetary token (in which the relationship between the material from which the token is made, and its exchange value, has historically become increasingly attenuated, arbitrary and even, as money assumes the mantle of pure informational form, virtual), the physical structure of “traditional” artefacts such as cups is not only non-arbitrary, but essential to its fulfilment of its canonical function.

Infants’ motivation to explore the physical world is well known, and it might be hypothesized that their apprehension of object properties in terms of function derives from an untutored, spontaneous sensori-motor engagement with the object as a purely physical entity (for example, the exploration of the cavity of a container giving rise to the dominance of this cavity in the early pre-conceptual representation of the object)

We have several sources of evidence that this is not so. First, while there is evidence of understanding of containment as a physical relationship at 6 months (Hespos and Baillargeon 2001), we were unable to detect canonicity effects in search tasks below the age of 9 months. This may, however, be a consequence of a motor-involving against a violation-of-expectancies methodology. Second, when the perceptual-cognitive link between canonical *orientation* and canonical containment *function* of cups was broken, by painting schematic faces either upright or upside down on the cups, the canonicity effect in infant search was abolished (Lloyd *et al.* 1981). This finding reinforces the conclusion that the canonicity effect is dependent upon socially cued expectations about the normative use of the object.

Even more decisive experimental evidence for the role of joint action in establishing canonical object concepts comes from the experimental design used in Freeman *et al.* (1981), where the object was functionally “ambiguous”, consisting of a set of stacking / nesting cubes. The child was invited by the experimenter to play with the entire set of cubes, and the experimenter set up this pre-test game as *either* a nesting *or* a stacking activity. After successfully completing, as joint action, an activity of constructing either a nest of cubes, or a tower of stacked cubes, the experimenter extracted a medium-size cube and a small cube, and conducted either an

action imitation task involving the placement of the smaller cube on top of/ inside/under the larger cube, or an acting-out language comprehension task with instructions to place the smaller cube “in”, “on” or “under” the larger cube. The results were dramatic. After playing a nesting game, children’s error patterns showed a response bias similar to the “canonicity effect” manifested in the same task using cups. In other words, there was a response preference for placing the small cube inside the larger cube. However, this effect was abolished in the stacking condition, in which there was a tendency to preferentially place the smaller cube *on top of* the larger cube.

To conclude this review of experimental evidence, we emphasize that canonical function and orientation, though they are in some sense “intrinsic” to the object as a material entity with determinate structure and affordances for human action, are not *essential* object properties in the same way as object substance. The stacking / nesting cubes experiment showed that the framing of the object in terms of its normatively appropriate function and orientation can be “locally” taught and negotiated. There is also inter-cultural variation in the canonical orientation and function assigned to classes of objects which may be materially identical between the cultures. For example, in the indigenous agrarian Zapotec culture of Southern Mexico, baskets are commonly stacked, and are frequently used as covers for foodstuffs and in children’s games of catching chickens. As well as these differences between Zapotec and Euro-American cultural practices, the Zapotec language lexicalizes the different spatial relations that are lexically distinguished by English “in” and “under” using a single body-part term, translatable as the English word “stomach”. Young Zapotec children differed from their Danish counterparts not only in their response patterns in language comprehension tasks using baskets, but also in non-linguistic action imitation tasks. The Zapotec children clearly did not regard the relationship of what *we* consider to be canonical containment, and the orientation that *we* would regard as “upright”, as being canonical (Sinha and Jensen de Lopez 2000; Jensen de Lopez 2003; Jensen de Lopez, Hayashi and Sinha 2005).

The experimental evidence we have reviewed supports the view, then, that it is the intersubjective structuration of the child’s participation in joint action, as much as (and indeed more so) than the affordances of the object “in itself”, that enables the child, in a process of “guided reinvention” (Lock 1980), to appropriate the norms

governing object use and to achieve an object representation in terms of canonical function. This process has a long developmental history, and the episodes of joint action are accompanied and mediated at every stage by the use of communicative signs by the adult participant, as is attested by the observations reported by Rodríguez and Moro (1992, 2002, this volume; see also Moro and Rodríguez 2005).

Throughout this developmental process, “objects are invested with significance. They become, for the child, material representations and signifiers of the rules, norms, values, rituals, needs and goals of the entire ... matrix within which they are embedded. In short, they become part of a meaningful system of signs” (Sinha (1988: 204).

4. From signifying object to communicative symbol

Artefacts, we have argued, have an intrinsic meaning given by their canonical function or use value. What an object “means” on any given occasion, however, is dependent upon more than just canonical function. Not only can an artefact be used non-canonically, as when, for example, a cup is used as a paperweight, but there are also socially constituted meanings which are relatively (and conceptually) autonomous from the canonical use value of the object. Primary amongst these, at least from a developmental point of view, is the meaning of the object as an *object of exchange*.

Give-and-take routines develop in our culture early in the second year of life. Such exchanges involve the super-imposition on the object of a semiotic status which is independent of its canonical function: that of an “abstract” signifier, and material embodiment, of a social relationship of exchange that social and anthropological researchers from Marcel Mauss (2000 [1923-24]) onwards have posited as a fundamental human universal (see Goux 1990). Object-exchange and the participatory induction of the infant into the normative knowledge of canonical object function are not *interactively* distinct in earlier triadic exchanges (Rodríguez and Moro this volume). However, the emergence of the give-and-take routine as a normative, reciprocal and mutually controlled format of co-participation lays the basis, we suggest, for the differentiation of signifier from signified that is necessary for mastery of the symbolic system of language. The object now becomes a signifier within a field constituted by differential, reciprocal and shifting subject positions: that

of giver and that of recipient. In psychoanalytic terms, the object signifies both *power* (to give or to withhold) and *desire* (the object *represents* a wish whose fulfilment is dependent upon the subjectivity of the Other, rather than being the immediate goal of a simple *demand*).

Whether or not participation in give-and-take routines is a strict precondition for language acquisition, it is undoubtedly, in normal developmental trajectories, a precursor of it. Object exchange is usually co-terminous with the early stages of the development of language, and precedes the vocabulary explosion of the second half of the second year of life. We hypothesize that it represents a fundamental step in the emergence of both subjectivity and the mastery of symbolization. The voluntary control in object exchange of the grasp and relinquishment of objects, governed by norms of communication rather than by immediate consummatory goals, prefigures the voluntary representational use of signs. Object exchange formats introduce into the triadic structure of joint attention a signifying element that is potentially extensible to the representational, “standing for” function of language. It also puts in place, in schematic and skeletal form, the perspectively shifting dynamics of deictic identification of speaker and hearer. Early object exchange, we submit, like the guided appropriation by pre-linguistic infants of canonical object functions, is a neglected, fundamentally social and materially mediated aspect of the development of primary intersubjectivity towards symbolic intersubjectivity.

5. Beyond the dyad: imagining communities and culture

In the preceding sections, we have focussed upon the role of objects in semiotically mediating the development of participation by the infant and young child in joint actions based upon intersubjective and socially shared conventional meanings. We have also focussed upon triadic contexts of interaction, in which the object is the “third term” of a semiotic triangle constituted by the interactions between two individuals (the prototypical dyad of developmental accounts of intersubjectivity, and the ideal-typical speaker and hearer of linguistic theory). What is missing in our account so far is the “Social Third Person”: not the Object, but the community of practice and meaning that ultimately sanctions the norms governing the interactions between any two or more participants in their dealings with social reality. In confronting this construct—Society, Community or however it may be designated—we encounter a fundamental problem of the social and human sciences. How do we

reconcile the agency of human subjects, their capacity for creating novelty, with the determining (though not strictly deterministic) structures and processes which permit the development of the encultured and socialized subject? In this section, we maintain our focus on the role of objects and “inter-objectivity” in what Fogel, Valsiner and Lyra (1997) have called “the dynamics of indeterminism in developmental and social processes”; with particular reference to the article in that volume of that title by Smolka, de Góes and Pino.

Smolka et al. (1997: 160) pose the following question: “In what way is [the development of the] sign related to the processes that generate or anchor creativity and individual resistance, the power of violating canonical rules?” They report and analyze an episode of socio-dramatic pretend play by a group of three 5-6 year old girls in the “house corner” of a primary school classroom, in which a cowboy hat played a crucial role as a prop in an enacted dramatic narrative. The hat, initially introduced into the play with an “extended” canonical meaning as a fashion accessory, later became a signifier of a new identity adopted by one of the girls as a feminine counterpart of a cowboy character who was a part of the background common knowledge of all the girls comprising the group. Crucial both to the investigators’ interpretation of this process, *and* to the children’s construction of their “play world”, was the creative linguistic designation of the character (signified by the hat as well as by the linguistic sign) as “Bete Carrera”, a grammatical feminization (in the Portuguese language) of the name of the male cowboy character recruited from common knowledge (see Sinha 2005, for a fuller analysis).

As Smolka *et al.* point out, the cowboy hat, *qua* artefactual object, remained throughout a hat, never used by the children as anything other than a hat. At the same time, it “became”—or, rather, came to signify—*more than* the canonical rules of object-usage that it embodied.

Through language, the children created Bete Carrera, the feminine of Beto Carrero ... Language allows for this specific appropriation, for such a construction and transformation; it allows for a ‘performance’ that synthesizes old and new modes and models of acting. Through language, it is possible to become another, to become *homo duplex* ... or, in fact, *multiplex*. In this consists the dramatic character of human experience. (Smolka, Góes and Pino 1997: 161).

The hat is thus simultaneously situated at two levels of meaning. At the first level, its canonical function is appropriated enactively by the participants (by putting it on and taking it off). At this first level, the construal of the hat is intersubjectively shared, non-contested and constant: the hat remains a hat. At the second level, the hat is invested with a “surplus meaning” which goes beyond canonicity. At this second level the hat comes to signify the subjective positionings and perspectives of the individual participants within a more comprehensive, discursively constituted and gendered frame, by means of which, say Smolka *et al.* (1997: 161), “the signifying aspect of the (inter)subjective actions ... necessarily implies ... immersion in language and meaning production.”

The discursive frame is one of *narrativity* (Hutto this volume), through which, as Lightfoot (1997: 174) puts it, “temporal rhythm becomes history, and transitory meanings become forms of knowledge which linger long enough to be toyed with.” Through intersubjectively shared and constructed narrative, the world and the identity of the subject can simultaneously be explored, renewed and consolidated. As we emphasized earlier, this is a process in which emotional investment plays as important a role as cognitive structure, the two aspects being fused in what the cultural theorist Raymond Williams called “structures of feeling”. Here is what Williams (1977: 128) says about temporality in cultural activity and structures of feeling:

If the social is always past, in the sense that it is always formed, we have indeed to find new terms for the undeniable experience of the present: not only the temporal present, the realization of this and this instant, but the specificity of the present being, the inalienably physical, within which we may discern and acknowledge institutions, formations, positions, but not always as fixed products, defining products.

Earlier, we drew upon Durkheim’s notion of social facts, emphasizing the “already there and formed” exteriority and objectivity of norms and institutions. Williams, in contrast, reminds us that it is through intersubjective agency in the present that social life and its normative institutions are enactively re-fashioned, permitting through the medium of shared narrative resources the construction of both the here-and-now and face-to-face shared mind, and the imagined community of unknown others whose history and identity we share (Anderson 1991). Williams also reminds us of the “inalienably physical” nature of participation and experience.

Throughout this chapter, we have emphasized the neglected but vitally important role not only of the (inter)corporeal body, but of the (inter)objective materiality of shared “things at hand”; not merely in sustaining, but in developmentally constructing the shared mind.

¹ Of course, there must always have been some (mythic) inventor of a social fact, such as money, and at least one other participant to understand the intention behind the invention, but once invented, the social fact acquires a relative ontological autonomy.

² Expressed in an older philosophical lexicon, canonicity of object function is a normative phenomenon existing at the interface between “Erste Natur” and “Zweite Natur”.

Appendix: Social Facts, Semiotics and Language

Chris Sinha

In this Appendix I attempt to clarify the nature of social facts, and their intrinsically semiotic status; to analyze signification as a special category of social fact; and to analyze language as a social institution and signifying system. I use the term “social fact” to cover objects, acts, activities, institutions etc. We can start from John Searle’s (1995: 28) definition of social facts:

1. X counts as Y in C

Where C = context.

Using Searle’s example, a twenty dollar bill *counts as* a monetary token with this particular exchange value. We may note that the note does not *stand for* or *represent* 20 dollars, it *is* twenty dollars. It is self-identical; its value is subtended by (though non-reducible to) its material existence. Destroy the note, you destroy the value. In the same way, the utterance of “I’m warning you!” *counts as* a warning in the context of speaker and hearer both being speakers of English. It is always the case that X is a token with material substance, though Y need not be. Indeed, Y is often an instance of the Social Imaginary (Castoriadis 1987; Sinha in press), as when a cup of communion wine “counts as” the blood of Christ. Therefore,

X = real material token

Y = meaning / value

Following Searle, we can regard this as a “primitive” or foundational building block of social ontology. The necessary context includes social participants for whom the

“counting for” relationship is evident, a specific requirement which we might wish to separately notate:

2. X counts as Y for P_(2...n) in C

Where P = Participant

Note that what are traditionally called “natural signs”, such as “smoke means fire”, are *not* social facts, because they do not involve the *necessary* mutuality of the “counting for” relationship (a point which clarifies Searle’s own somewhat obscure discussion of collective intentionality). Therefore, we can conclude that the analysis of social facts validates three important propositions:

- a) all social facts are semiotic facts, since they involve the relationship between a material token and its meaning.
- b) meaning is a wider and more general category than signification (“standing for”).
- c) meaning is also a wider category than social meaning.

Signification, that is, the relationship of representing or “standing for”, which distinguishes true signs from all other tokens, requires a further embedded specification. This can be derived from the *conditions on representation* that are specified as follows by Sinha (1988: 37): “To represent something ... is to cause something else to stand for it, in such a way that both the relationship of ‘standing for’, and that which is intended to be represented, can be recognized.” The causation involved in representation is *mental*, and dependent upon the *inter-mental* “counting as” relationship. We can notate the relationship of signification as follows:

3. [X counts as S and S stands for M] for P_(2 ... n) in C

Where:

X = real material token

S = signifier

M = (signified) meaning

This simple notation clarifies both the duality of structure of the sign (the conventional unity of signifying substance and signification); and the fact that this duality is irreducibly normative. It is the duality of *normative* structure, of both

“counting as” and “standing for” as social facts, that is constitutive of the conditions of representation as set out above.

This formulation also helps to clarify the complex nature of much ritual “symbolism”. We can, for example, examine the status (contested by Catholic and Protestant theologians) of the communion wine; does it actually *count as* (an instance of) the blood of Christ, or does it symbolize or “stand for” the blood of Christ, or both? Catholics consider this a mystery of religion, while non-Catholics view the first interpretation as superstition.

Some signs are part of sign systems, that is to say, part of the context is the system; and since any such system is the shared knowledge of a community of users, this community constitutes the potential totality of participants. We can then notate the *general* case of systematic signification as follows:

4. [X counts as S and S stands for M in C_s] for C_u

Where:

C_s = sign system

C_u = community of users

In the specific case of language, we can reduce the notion of a sign system shared by a community of users to the simple term L, language, thus:

5. L=C_s for C_u

Now any grammatical and meaningful instance of language use can be annotated:

6. [X counts as S and S stands for M] in L

Note that, consistently with the approach of Cognitive Grammar (Langacker 1987), S (the signifier) is an expression at any level, sub-lexical, lexical or constructional; grammatical assemblies of signs are also signs.

This enables us to further distinguish the sub-systems of language:

7. Grammar (in the wide, Cognitive Grammar sense, including lexical form and phonology):

X counts as S in L

Unpacked: X is an instance of S and S is a grammatical expression in L. The distinction between X and S is the distinction between, for example, phonetics and phonology.

8. Semantics

Presupposing 7:

S stands for M in L

This is the relation between, for example, word form and lexical entry or concept; or, more generally, between linguistic expression and linguistic conceptualization.

9. Pragmatics

Presupposing 7 and 8:

S counts as A_s for $P_{(2 \dots n)}$ in C_d

Where:

A_s =Speech act (including reference)

C_d =Discourse context

It should be noted that, under this description, pragmatics is the closest of the linguistic subsystems to the simplex “counting as” relationship. This accords with the intuition that pragmatics is not “systematic” in quite the same way as grammar and semantics; that speech acts are specifically linguistic instances of more general communicative acts (such as threats in both human and non-human species); and that their interpretation is dependent on gesture, prosody, posture, physical and linguistic context.

Having employed the formalism to distinguish the subsystems of language one from another, we can now re-assemble them to analyze the structure of particular utterances in their context.

10. [X counts as S and S stands for M] in L and S counts as A_s in C_d

However, such a re-assembly does not yet account for the *interaction* between semantics, pragmatics, context and shared world knowledge in actual utterances. For example, if the utterance is “You really did well this time!” and it is clear from the context that the speech act is one of ironic praise, the contextual meaning is “You did

very badly”. Or, if the utterance is “The road meanders up the hill”, the contextual meaning is that the road has a winding path, not that the road is itself in motion (Talmy 1996). How can we capture such facts of language?

It seems to me impossible to do so without appealing to psychological processes as such inference, default and prototypic reasoning, subjectivization and perspectivization. This is the fundamental insight which drives cognitive linguistics. If we wish to formalize this, it would look something like this:

11. [X counts as S and S stands for M] in L and S counts as A_s in C_d

=> S counts as (having) M_c for H in C_d

Where:

M_c = Contextual meaning

H = Hearer

This brings us back in an intriguing hermeneutic circle to the original Searlian definition of a social fact, and emphasizes the truism that, in the end, all meaning is contextual and situated. This does not, however, mean the same as saying that there are no institutionalized, relatively stable, relatively autonomous and systematic social facts; indeed, it is precisely this very relative stability and autonomy which constitutes the objectivity of social facts emphasized by Durkheim.

This objectivity is not to be confused with the *objectivism* of formal, truth conditional semantics. Amongst the advantages of the simple formal description that I have developed here is that, first, the account of semantic meaning is underdetermined by this formulation, and need not be truth-functional, but *is* conventional and normative (as indeed are all the subsystems). Second, semantics is distinguished from pragmatics without necessitating a truth functional semantics. Third, contextual dependence characterizes all subsystems, as well as the interactions between them, but does not erase the distinctions between them. Fourth, language as a social institution has its own proper structure which necessitates, but is irreducible to, the intentionality of its users. Language, like all social facts, is an objectification of intersubjectivity, with an emergent structure relatively autonomous from the intentional states (such as mutual knowledge of the language) which are possessed by its users and “subjects”. It is in this fact that the objectivity of language inheres.

References

- Anderson, B. 1991. *Imagined Communities*. London: Verso.
- Bruner, J.S. 1966. "An overview." In *Studies in Cognitive Growth*, Bruner, J.,S., Oliver, R.R., and Greenfield, P.M., Hornsby, Kenney, H.J.(eds.), 319-326. New York: Wiley.
- Budwig, N. 2000. Language and the Construction of Self. In *Communication: An Arena of Development*, N. Budwig, I. Uzgiris and J. Wertsch (eds.), 95-214. Stamford: Ablex.
- Castoriadis, C. 1987. *The Imaginary Institution of Society*. Cambridge: Polity Press.
- Clark, H.H. 1996. *Using Language*. Cambridge: Cambridge University Press.
- Durkheim, E. 1895. *Les Règles de la méthode sociologique*. Paris: Alcan. 1894a, with slight modifications, and a preface. Tr. 1982 as "The Rules of Sociological Method", in *The Rules of Sociological Method and Selected Texts on Sociology and its Method*, S. Lukes (ed.), 29-163. London and Basingstoke: Macmillan.
- Freeman, N., S. Lloyd and C. Sinha 1980. "Infant search tasks reveal early concepts of containment and canonical usage of objects." *Cognition* 8: 243-262.
- Freeman, N., C. Sinha and S. Condliiff. (1981 "Confrontation and collaboration with young children in language comprehension tasks." In *Communication in Development*, W.P. Robinson (ed.), 63-88. London, Academic Press.
- Fogel, M. Lyra and J. Valsiner (eds.). *Dynamics and Indeterminism in Developmental and Social Processes*. Mahwah, NJ: Lawrence Earlbaum Associates.
- Gibson, J.J. 1979. *The Ecological Approach to Visual Perception*. Boston: Houghton Mifflin.
- Goodwin, C. and Goodwin, M. H. 2004. "Participation." In *A Companion to Linguistic Anthropology*, A. Duranti (ed.), 222-244. Oxford, Blackwell.
- Goux, J.J. 1990. *Symbolic Economies*. Ithaca, NY: Cornell University Press.
- Hespos, S. and Baillargeon R. 2001. "Knowledge about containment events in very young infants." *Cognition* 78: 204–245.

- Hutto, D. this volume. "First communions: Mimetic sharing without theory of mind modules"
- Itkonen, E. this volume. "The central role of normativity in language and linguistics"
- Jensen de Lopez, K., Hayashi, M. and Sinha, C. 2005. "Early shaping of spatial meanings in three languages and cultures: linguistic or cultural relativity?" In *Selected Papers from the LACUS Forum XXXI 2003: Interconnections*, A. Makkai, W. J. Sullivan, and A. R. Lommel (eds.), 377-386. Houston, Texas: Linguistic Association of Canada and the United States.
- Jensen de Lopez, K. 2003. *Baskets and Body-Parts: a cross-cultural and cross-linguistic investigation of children's development of spatial cognition and language*. PhD dissertation, University of Aarhus.
- Jones, R.A. 1986. *Emile Durkheim: An Introduction to Four Major Works*. Beverly Hills, CA: Sage Publications.
- Langacker, R.W. 1987. *Foundations of Cognitive Grammar Vol. 1, Theoretical Prerequisites*. Stanford: Stanford University Press.
- Lewis, D.K. 1969. *Convention: A Philosophical Study*. Cambridge, MA: Harvard University Press.
- Lightfoot, C. 1997. "Transforming the canonical cowboy: Notes on the determinacy and indeterminacy of children's play and cultural development." In *Dynamics and Indeterminism in Developmental and Social Processes*, A. Fogel, M. Lyra and J. Valsiner (eds.), 165-174. Mahwah, NJ: Lawrence Erlbaum Associates.
- Lloyd, S., C. Sinha and N. Freeman. 1981. "Spatial reference systems and the canonicity effect in infant search." *Journal of Experimental Child Psychology* 32 1-10.
- Lock, A. 1980. *The Guided Reinvention of Language*. London, Academic Press.
- Mauss, M. 2000. *The Gift : The Form and Reason for Exchange in Archaic Societies* (Original publication 1923-1924 : Transl. W.D. Halls). New York : W.W. Norton.
- Merleau-Ponty, M. 1962. *Phenomenology of Perception*. London : Routledge and Kegan Paul.

- Murray, L. and Trevarthen, C. 1986. "The infant's role in mother-infant communications." *Journal of Child Language* 13(1):15-29
- Moro, C. and Rodríguez, C. 2005. *L'objet et la construction de son usage chez le bébé. Une approche sémiotique du développement préverbal*. Berne-New York: Peter Lang.
- Moscovici, S. *Social Representations*. Cambridge: Polity Press.
- Netchine-Grynberg, G. and Netchine, S. 2002. "Vygotski, Wallon et les "mondes communs"". In *Avec Vygotski*, Y. Clot (ed.), 85-104. Paris: La Dispute.
- Rakoczy, H. 2006. "Pretend play and the development of collective intentionality". *Cognitive Ssystems Research* 7: 113-127.
- Reddy, V., Hay, D., Murray, L. and Trevarthen, C. 1997. "Communication in infancy: Mutual regulation of affect and attention." In *Infant Development: Recent Advances*, G. Bremner, A. Slater and G. Butterworth (eds.), 247-273. Hove: Erlbaum Taylor and Francis Ltd.
- Rodríguez, C. 2006. *Del ritmo al símbolo. Los signos en el nacimiento de la inteligencia*. Barcelona: Horsori.
- Rodríguez, C. and Moro, C. 1999. *El mágico número tres. Cuando los niños aún no hablan*. Barcelona: Paidós.
- Rodríguez, C. and Moro C. 2002. "Objeto, comunicación y símbolo. Una mirada a los primeros usos simbólicos de los objetos." *Estudios de Psicología* 23-3: 323-33.
- Rodríguez, C. and Moro C. This volume. "Coming to agreement: Object use by infants and adults"
- Shotter, J. 1978. "The cultural context of communication studies: theoretical and methodological issues." In *Action, Gesture and Symbol : The Emergence of Language*. A. Lock (ed.), 43-78. London : Academic Press.
- Shotter, J. 1995. "In conversation : joint action, shared intentionality and ethics." *Theory and Psychology* 5 : 49-73.
- Searle, J. 1995. *The Construction of Social Reality*. London: Allen Lane.
- Sinha, C. 1982. "Representational development and the structure of action." In *Social*

- Cognition: Studies in the Development of Understanding*, G. Butterworth and P. Light (eds.), 137-162. Brighton: Harvester,.
- Sinha, C. 1983. "Background knowledge, presupposition and canonicity." In *Concept Development and the Development of Word Meaning*, T. Seiler and W. Wannemacher (eds.), 269-296. Berlin: Springer-Verlag.
- Sinha, C. 1988. *Language and Representation: A Socio-Naturalistic Approach to Human Development*. Hemel Hempstead: Harvester-Wheatsheaf.
- Sinha, C. 1999. "Grounding, mapping and acts of meaning." In *Cognitive Linguistics: Foundations, Scope and Methodology*, Janssen, T. and Redeker, G. (eds.), 223-256. Berlin: Mouton de Gruyter.
- Sinha C. 2005. "Blending out of the background: Play, props and staging in the material world." *Journal of Pragmatics* 37: 1537—1554.
- Sinha, C. in press. "Iconology and imagination in human development." In *Religious Narrative, Cognition and Culture: Image and Word in the Mind of Narrative*, A.W. Geertz and J.S Jensen (eds.). London: Equinox Publishing.
- Sinha, C. and Jensen de López, K. 2000. "Language, culture and the embodiment of spatial cognition." *Cognitive Linguistics* 11: 17-41.
- Smolka, Ana-Luisa, Gões, Maria de and Pino, Angel, 1997.. "(In)Determinacy and the semiotic constitution of subjectivity." In *Dynamics and Indeterminism in Developmental and Social Processes*, A. Fogel, M. Lyra and J. Valsiner (eds.), 153-164. Mahwah, NJ: Lawrence Earlbaum Associates.
- Sohn-Rethel, A. 1977. *Intellectual and Manual Labor: A Critique of Epistemology*. Atlantic Highlands, NJ: Humanities Press.
- Talmy, L. 1996. "Fictive motion in language and perception." In *Language and Space*, P. Bloom, M. Peterson, L. Nadel, L. and M. Garrett (eds.), 211-276. Cambridge, MA: MIT Press.
- Trevarthen, C. 1979. "Communication and cooperation in early infancy : a description of primary intersubjectivity." In *Before Speech: The Beginning of Interpersonal Communication*, M. Bullowa (ed.), 321-347. Cambridge: Cambridge University Press.

- Trevarthen, C. 1998. "The concept and foundations of infant intersubjectivity." In *Intersubjective Communication and Emotion in Early Ontogeny*, S. Bråten (ed.), 15-46. Cambridge: Cambridge University Press.
- Tomasello, M. 1999. *The Cultural Origins of Human Cognition*. Cambridge, MA: Harvard University Press.
- Tomasello, M., Carpenter, M., Call, J. Behne, T. and Moll H. 2005. "Understanding and sharing intentions: The origins of cultural cognition." *Behavioral and Brain Sciences*, 28: 675-735.
- Vandeloise, C. 1991. *Spatial Prepositions: A Case Study from French*. Chicago: Chicago University Press.
- Vygotsky, L.S. 1978. *Mind in Society: The Development of Higher Psychological Processes*. Cambridge, MA: Harvard University Press.
- Walkerdine, V. and C. Sinha. 1978. "The internal triangle: Language, reasoning and the social context." In *The Social Context of Language*, I. Markova (ed.), 151-176. London: Wiley.
- Wallon, H. 1925/1984. *L'enfant turbulent. Etude sur les retards et les anomalies du développement moteur et mental*. Paris: PUF.
- Williams, R. 1977. *Marxism and Literature*. Oxford: Oxford University Press.
- Uzgiris, I. 2000. "Words don't tell all: Some thoughts on early communication development." In *Communication: An Arena of Development*, N. Budwig, I. Uzgiris and J. Wertsch (ed.), 131-141). Stamford: Ablex.
- Wallon, H. 1984. *L'enfant turbulent. Etude sur les retards et les anomalies du développement moteur et mental*. Paris: PUF.
- Zazzo, R. 1975. *Psychologie et Marxisme. La vie et l'oeuvre d'Henri Wallon*. Paris: Denoël/Gonthier.
- Zlatev, J. this volume. "The co-evolution of intersubjectivity and bodily mimesis"