Spatial Demonstratives, Perceptual Space, and Linguistic Diversity

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Keywords: Spatial and temporal demonstratives; peripersonal versus extrapersonal space; object location memory

Extended Abstract

Communication involves a combination of speech and gestures, which afford joint attention between speaker and interlocutor (Tomasello, 1999, 2003; Kita, 2003). Characterizing the mapping between language and the vision and action systems is therefore essential in order to understand both normal and disordered communication. In a series of five experiments we target this mapping with respect to one the most central components of natural language semantics - *spatial demonstratives*.

Although there is a large literature on the mapping between spatial language and space, including prepositions and space, (e.g. Burigo & **Coventry**, 2010; **Coventry** & Garrod, 2004; **Coventry**, Cangelosi, Monrouxe, Joyce, & Richardson, 2010; **Coventry**, Tenbrink & Bateman, 2010) and quantifiers and space (e.g. **Coventry**, Cangelosi, Newstead, & Bugmann, 2010), there is a notable absence of empirical work on demonstratives. Yet spatial demonstratives, such as *this* and *that*, are more closely associated with deictic gestures than any other linguistic items (Diessel, 2006; Enfield, 2003; Levinson, 2004), they occur in all languages, are among the most frequent terms within a language, appear early in child language acquisition, and philologically emerge as the earliest traceable words in languages (Deutscher, 2005; Diessel, 2006). Therefore demonstratives are a natural place to start to examine how language and vision and action map onto one another, and whether they are associated with the same or different underlying representations.

The absence of work on demonstratives in cognitive science generally is even more surprising when one considers that demonstratives occur in spatial and non-spatial contexts. *This* can be used to refer to objects or events in close temporal proximity, while *that* can be used to refer to such objects and events out of temporal focus (see Diessel, 1999 for discussion). In the context of work examining the extent to which space acts as a structuring tool for non-spatial domains (see for example Lakoff & Johnson, 1980, 1999; Casasanto & Boroditsky, 2008), demonstratives therefore afford an excellent test domain within which to examine the relationship between different uses of the same lexical items.

Recently **Coventry,** Valdés, Castillo, and Guijarro-Fuentes (2008; see also Bonfiglioli et al., 2009) tested the mapping between perceptual space and demonstrative use for the first time using a new methodology designed to elicit spatial demonstratives without speakers realizing that their language was being tested. Participants played a 'memory game' where the goal of the game was to remember the positions of objects (colored shapes) placed on 12 colored dots along the midline of a large conference table. Participants were informed that they were taking part in an experiment on the effects of language on memory for object location and that they were in the 'language condition.' They were first told that cards would be read out with a placement instruction (e.g., "You place green triangle on red dot"). Following placement, participants were instructed that they had to point to each object naming it using a combination of just three words: a demonstrative, a color and a shape (e.g., *this/that red triangle*), so that everyone in the 'language condition' experienced the same level of language coding. Coventry et al. manipulated the distance between the participant and placed object, whether participants used their hand or a 70cm stick when pointing at the objects placed, and who placed the object. These latter two manipulations were motivated by neuropsychological work suggesting contact with objects is important for the extension of peripersonal space. Berti and Frassinetti (2000) document the case of a patient who showed a dissociation between near and far space in the manifestation of neglect, illustrated by impaired performance on a line bisection task in near space but not in far space when using a light pen to perform the task. However when the participant performed the same task using a stick, performance on the task in far space deteriorated, mirroring the performance in near space. Berti and Frassinetti argue that the stick extended the body remapping far space as near space. The results of this first study using the memory game method revealed that the use of the stick extended the use of *this* in English and *este* in Spanish to the region beyond the end of the hand to the end of the stick, mirroring the effects found for the extension of near space in neglect patients.

While it would seem intuitive that there is a mapping between near-far space and the use of spatial demonstratives, this view has been challenged (Kemmerer, 2006). Notably while a proximal versus distal contrast appears to be the most common demonstrative contrast across languages (Diessel, 2005), languages make a range of more diverse contrasts in their demonstrative systems, including person centered contrasts (Japanse), whether an object is visible or not (Tiriyó), and whether is owned by the speaker (Supyire)(Diessel, 1999, 2005).

In this talk we report the results of five experiments using the memory game paradigm designed to 1) tease

apart the mapping between perceptual space and spatial demonstratives, and 2) test whether English demonstratives are subject to the influence of variables that are lexicalized in other languages. Experiment 1 manipulated whether contact is necessary between a tool and an object for an extension of *this* to occur (as in Coventry et al., 2008). This was motivated by neuropsychological work indicating that an extension of near space to far space with tool use occurs when the tool is used to functionally interact/make contact with an object (e.g., Iriki et al., 1996; Farnè et al, 2005; Witt et al., 2005). Experiment 2 examined the influence of deictic centre on demonstrative choice, Experiment 3 tested whether demonstrative choice is affected by whether an object is occluded or not, Experiment 4 tested whether ownership affects demonstrative choice, and Experiment 5 tested whether object familiarity affects demonstrative choice.

The results of these experiments show that spatial demonstrative choice in English is much more similar to demonstrative contrasts in other languages than a simple binary proximal-distal contrast in English would suggest. Put simply, lexical distinctions for these terms are not diagnostic of the parameters that affect their usage. Moreover the results reinforce the importance of the mapping between peripersonal and extrapersonal space and demonstrative choice – but with an enriched conceptualization of what peripersonal space entails. Consequences of this for the relationship between spatial and temporal uses of demonstratives will be discussed.

Acknowledgments

This work has been funded by grant number RES-062-23-2752 from the Economic and Social Research Council (UK) awarded to the first two authors.

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