Some Concerns about Methodology on Spatial Representation

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I would like to take the opportunity of this Specialist Meeting to raise a number of methodological concerns which have troubled me over the years. Many of these worries are not new to the field, but they remain largely unresolved in much of the work conducted today even while some of these concerns are strong enough to potentially invalidate the interpretations of the results. As my own work has concerned the relationship between linguistic representation and performance on ostensibly nonlinguistic tasks, I would address each of these in turn.

Whether the goal is typology or comparison with non-linguistic performance, linguistic elicitation presumes relevant variation. As any second language learner can attest, one is biased to assume that translation equivalents across languages are uniformly equivalent in the absence of contrary indication. Unfortunately, when working with other languages, it is often years of work, if ever, before one discovers that terms across two languages which seem to have the same functional equivalence in most contexts, nonetheless may have substantially different underlying semantics. This wouldn’t be a problem if language elicitation did not rely so heavily on translation, but avoiding translation is a more difficult problem than just working monolingually. For example, I was occasionally corrected in my use of the Tamil deictic verbs “go” and “come.” It turned out that the translations are largely accurate, but the Tamils I was working with tended to use “come” as the more generic motion verb (e.g. for describing motion passing in front of the speaker) with “go” being more specialized for motion away from the speaker. I was sometimes corrected by Tamils who were fluent in South Indian English and they were puzzled by my confusion because they used English “go” and “come” in the same way as for their native Tamil—believing, like me, that these forms were naturally equivalent across all situations.

As another example, consider the problem of translating prepositions from one language to another. Without knowing the exact extensional set for the form in one language it is impossible to predict which would be the appropriate spatial term in another language. Indeed, the domain of Germanic prepositions is one of the last domains to be mastered even, e.g., by German speakers fluent in English. Even for analysis of naturally occurring language production, we cannot ever be certain of what an utterance can mean without translation unless we know not only the exact context of use. A common solution to this problem is to use an “etic” stimuli set such as the Topological Relations Picture Series or the “Tomato films” when comparing languages. However, even this can only be a solution if we are confident of the particular intended construal that the speaker is representing. (e.g., Is the ball in or on the field?) It is a rare study which explains what method was used to ensure clear and consistent interpretation of that which is being described.
A further problem is the nature of the usage of a form. Obviously, we can only compare forms when we can equate or at least identify the context of use. But what constitutes context for elicitation purposes? Are two “exact” translation equivalents identical if one is broadly used in one language, but only used in the other language in very specific circumstances? Can the semantics of two forms be even remotely similar if the one form has a number of paradigmatically contrastive alternatives, while the other form alternates with only another broadly used form? As a trivial example, English at is often used as a translation of the locative case in many languages. However, the use of at is remarkably specific and nuanced in ways quite distinct from the more general locative case in most languages.

This of course, leads also to the problem of translations of instructions to participants in non-linguistic tasks as well. I have been in countless hours of discussion with many researchers on how one might reliably translate concepts in experimental instructions such as “same” and “similar.” If one is uncertain how such translations are being interpreted in a task, then we must honestly say that that we don’t actually know what task the participants believe themselves to be engaged in.

As any experimentalist knows, much hinges on the interpretation of the task far beyond the problem of translating instructions. Perhaps no experimental paradigm brings this more to the fore than triads tasks in which participants are asked to group a pivot item with either of two target items—each of which clearly relate to the pivot in distinct but valid ways. In debriefing, participants commonly state that they alternate solutions, guess what the experimenter is really asking for, or just pick one solution when they feel that the other was an equally acceptable answer for them. (This is quite distinct from, e.g., AXB tasks in which the targets vary along a single perceptual dimension such as voice onset in a phonetics perception experiment.) One might think that this fundamental problem with triads tasks would render them nearly useless, yet they remain one of the more popular experimental designs especially in the challenging area of comparing linguistic and non-linguistic representations.

I will conclude with one final example: the Animals in a Row task, described in Pederson et al. 1998 and elsewhere. This task was a memory task in which subjects were presented with three animals (of an available four) in a line transverse to the participant on a table or mat in front of them. They were then taken to another room or substantially away from the first table and simply asked to rebuild the line of animals in the second location. The original design combined two critical features: First, the participants were presented with tables in a 180-degree rotation from the participants such that the orientation of the line upon reconstruction could be interpreted as consistent with either an egocentric or a geocentric memory encoding of the original display. Importantly, the 180-degree rotation was a simple consequence of traveling to a different and remote table and as such was not a particularly salient aspect of the experiment for the participants. There have been a number of quasi-replications of this original design which simply spun participants around 180 degrees making this rotation quite a prominent part of the design for them and presumably inviting an interpretation of this feature.
The second critical feature is that the dependent variable was not the order of the animals, but rather the facing orientation of the animals when the line was rebuilt. Participants clearly understood the task as about the selection and order of the animals and not particularly about the orientation. (I have recordings of subjects repeating “horse, pig, sheep; horse pig sheep” as they march from one room to the other, but no one adds “all facing to the East.” In other words, the dependent variable is covertly embedded in an otherwise transparent task, which reasonably ensures that the response in orientation is essentially an unreflective or “natural” response, presumably indicating an underlying representation of the orientation rather than an attempt to guess the purpose of the design. It is remarkable how many pseudo-replications of the Animals in a Row task have changed these two features—without explicit motivation—and received unsurprisingly different results. Witness the exchange between Li & Gleitman and Levinson et alibi. (2002).

At the Specialist Meeting, I would like to discuss these methodological issues and work toward a more common understanding to improve our future empirical designs.