Pointing and Describing in Referential Communication

Adrian Bangerter (adrian.bangerter@unine.ch)
Eric Chevalley (eric.chevalley@unine.ch)
Groupe de Psychologie Appliquée, University of Neuchâtel
Fbg. de l'Hôpital 106, 2000 Neuchâtel, Switzerland

Introduction

It is unclear what role pointing gestures play in referential communication. They may serve to identify referents of deictic expressions (e.g., when uttering *John is right here* and pointing, the pointing gestures identifies the referent of *right here*). But pointing may also focus addressee attention on a sub-region of shared visual space, thereby facilitating concurrent descriptions (Bangerter, 2004). The present study proposes that pointing and describing are used flexibly, as a function of the communicative situation. Pairs identified target pictures from an array. We manipulated the *ambiguity* of pointing gestures by systematically varying the number of pictures in the array. When gestures are unambiguous, it may be easier to identify a target simply by indicating it. When gestures are ambiguous, participants may use them to focus attention, narrowing down the potential set of referents, and rely on descriptions to disambiguate the target within that set. Thus gestures may replace both descriptions of target location (focusing attention) and target features (identifying), depending on ambiguity.

We also investigated the relation of different types of pointing gesture to language use. The communicative function of other gesture types (e.g., iconic gestures) has been debated. Research shows that they may be functional for production rather than comprehension (Krauss, 1998).

Method

Twenty-four French-speaking pairs (director and matcher) worked together. The matcher did not know the targets. They talked and/or gestured to identify each target for the matcher. They identified 4 target pictures (photos of people) from each of 12 arrays. There were 2 arrays with 8, 9, 11, 14, 20 and 37 pictures respectively. These numbers constituted a 6-point linearly decreasing scale of the average probability of chance identification of a target. This variable is array *density*. In a *visible* condition (n = 12), pairs could see each other and thus use gestures; in a *hidden* condition (n = 12), they couldn't. The hidden condition was a control condition to measure the efficiency of gestures. Thus, the study had a 2 (visibility) by 6 (density) mixed-model design.

Pairs were videotaped and communication was transcribed. Use of gestures and descriptions was coded. This included general spatial descriptions (e.g. *John is on the left*), spatial descriptions relative to another picture (relative spatial descriptions, *Betty is the one below the redhead*) or feature descriptions (e.g., *John has glasses*).

Two types of gesture were coded: elbow resting on table (Type 1), and elbow raised (Type 2). Type 1 gestures involve little movement from a resting position and may be automatic. Type 2 gestures involve extensive arm and hand movement, and are thus probably intended to communicate. All variables had high inter-rater agreement (all κs >.71).

Results

Verbal effort varied by condition (F[1, 21] = 37.8, p < .0001), array density (F[5, 17] = 50.7, p < .0001), and their interaction (F[5, 17] = 8.7, p < .0001), indicating that pairs in both conditions used more effort as density increased, but that visible pairs used less verbal effort than hidden pairs.

For visible pairs, Type 2 gestures correlated negatively with verbal effort (r = -.81, p = .001), indicating that the reduction of verbal effort was due to gesture use. At the level of the individual target (n = 571), Type 2 pointing gestures correlated negatively with general spatial descriptions (r = -.19, p < .0001) and feature descriptions (r = -.19, p < .0001). Thus, Type 2 gestures clearly have a communicative function. They are used both to focus attention (replacing general location descriptions) and identify targets (replacing feature descriptions). Type 1 gestures had significant positive relationships with verbal effort and with descriptions, suggesting that they were associated with language production difficulties. There was no clear relationship between ambiguity (density) and the type of descriptions gestures substituted for.

For hidden pairs, Type 2 gestures were infrequent, but Type 1 gestures were not (there were no differences in Type 1 use between visible and hidden conditions). Type 2 gestures did not correlate with a reduction in verbal effort (r = .09, *ns*), whereas Type 1 gestures correlated with an increase in verbal effort (r = .57, p = .052). These results further support the conclusion that Type 2 gestures are intended to communicate, whereas Type 1 gestures are automatic.

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References

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