

Testing Theories of Sentence Type

If sentence type is understood to include both sentence mood and polarity, but not the content of what Wittgenstein calls the sentence radical, it is obvious that sentence type is the foremost grammatical indicator of illocutionary force: Assertions and denials are distinguished by polarity, questions and assertions are distinguished by sentence mood. With respect to truth-conditional semantics, interrogatives have always presented a problem in that their content does not lend itself easily to bearing a truth value, so both positive and negative interrogatives seem to be in a way semantically between positive and negative assertions.

In the context of possible world semantics one way of dealing with this problem has been proposed by Hamblin (1958): Propositions are assumed to be the content of declarative sentences and are modeled as sets of possible worlds, their negations as complementary (modulo presuppositions) sets of possible worlds, and the content of interrogative sentences as sets of propositions, which for polar interrogatives are the pair sets of a proposition and its negation. This may be a well-defined basis for interesting research, but it completely lacks plausible grounding in human cognition: Positive and negative propositions are very different cognitive entities, assuming that representations of polar interrogatives involve negative propositions is doubtful at best, and the same holds for the equivalence of positive and negative interrogatives. Therefore several authors (Ginzburg & Sag 2000, Truckenbrodt 2004, Zaefferer 2004) have proposed different representations of the denotational content of interrogatives.

Following Austin (1950) we propose that propositional contents are mentally represented by pairs of representations of a situation token and a situation type: In positive declaratives the token fits the type and in negative declaratives a token that fits the negated type is replaced by one that fits the negating type. The question of truth arises in the form of a match between the represented situation token of the propositional content and another representation of the same situation that comes from a different source. The propositional content of interrogatives differs in that the question of truth does not arise: In positive interrogatives the representation of the token that fits the type is only a hypothetical one, and in negative interrogatives a token that fits the negated type is only hypothetically replaced by one that fits the negating type. Therefore the question of truth is replaced by the question of a match between the hypothetically represented (or hypothetically replaced) situation token of the propositional content and a definite representation of the same situation, which if it exists provides a positive, else a negative answer.

In order to test these assumptions we joined the family of research programs called *grounded cognition* (Barsalou 2008), *simulation semantics* (Bergen ms) and *embodied meaning* (Glenberg & Kaschak 2002) and adapted the latter's experimental design that demonstrated a kind of motor simulation called action–sentence compatibility effect (ACE) to our purposes. ACE is the influence of the action described in the sentence subjects are processing in the experiment on the motor response they have to perform: If described and performed action are motions with matching directions facilitation is observed (match advantage), whereas mismatching directions lead to inhibition.

Building on work about visual scenes by Bach & Zaefferer (2010) that supports our Austinian view of the content of polar interrogatives, we investigated the modulation of the ACE by different sentence moods (declarative and interrogative) and polarities (positive and negative). Participants heard sentences in the four conditions (which were the target of interspersed control questions) and simultaneously responded to visual stimuli by pressing a key either close

to or away from them. Our results are compatible with our assumptions and they are at variance with the Hamblin view: With positive declaratives we found a match advantage, replicating thus the findings by Glenberg, Kaschak and others, whereas in positive interrogatives this effect turned into its opposite, a mismatch advantage, the difference being highly significant. Another highly significant contrast was found between positive and negative interrogatives, pace Hamblin, with the latter patterning like positive declaratives (less surprisingly for linguists than for possible world theoreticians). In addition, the negation of declaratives made the match advantage disappear. It remains to be tested how exactly this relates to the findings of Kaup et al. (2007) and Tian et al. (2010).

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