

Investigating a shared mechanism in the priming of *manner* and *quantity* implicature.

Introduction: Debate exists surrounding the nature of the mechanism that derives *quantity* implicatures (e.g., the inference ‘*not all of the cars are green*’ from ‘*some of the cars are green*’). According to Gricean-inspired approaches, *quantity* implicature derivation is accounted for as a pragmatic, socially oriented phenomena. In contrast, competing accounts consider *quantity* implicature to be grammatically rooted (Chierchia et al., 2012, 2019; Fox, 2007).

Recently, structural priming paradigms have been adapted by Bott & Chemla (2016) and Rees & Bott (2018) to investigate different types of *quantity* implicature (*scalar quantifiers*, *ad hoc quantity* implicatures and *numerals*). Bott & Chemla conclude 1) *quantity* implicature subtypes can prime their own subsequent derivation (e.g., *scalar* implicature can prime the derivation of succeeding *scalar* implicatures) and 2) between certain subtypes of *quantity* implicature, a cross-priming effect can be observed (e.g., *ad hoc* implicature can prime *scalar* implicature). A cross-priming effect suggests that there are shared mechanisms involved in the derivation of certain subtypes of *quantity* implicature. However, the evidence of a shared derivational mechanism is compatible with both Gricean-inspired accounts and grammatically oriented approaches. As per a Gricean account, certain subtypes of *quantity* implicature require the same considerations of a more informative, unsaid, alternative, and assumptions of speaker cooperation and informativity to be derived – it may be that the relevance of these considerations and assumptions is primed between the experimental trials. In contrast, the grammatical account posits the existence of a covert operator **O** (semantically expressed as ‘*only*’), which is inserted within the syntax of an utterance and triggers the derivation and negation of a more informative alternative (e.g., ‘**O**[*some of the cars*] *are green*’ = ‘*only some of the cars are green not all of them*’)

To utilise a structural priming paradigm as a tool to reach theory-critical conclusions, we investigated whether a structural priming can be used to prime *manner* implicature (e.g., the inference ‘*we danced in an unusual/uncharacteristic way*’ derived from the utterance ‘*We moved our limbs to the music*’). Like *quantity* implicatures, *manner* implicatures are triggered by the derivation and negation of an unsaid alternative expression. With *manner* implicature, the ‘alternative’ is the non-marked, typical expression (e.g., ‘*we danced [typically]*’), which is negated (e.g., ‘*we did not dance typically*’) and is triggered by the use of obscure or unduly lengthy utterances (see Horn, 1991, Levinson 2000). Importantly, what is negated is not the semantic content of the alternative, unmarked, expression, but the typical connotations of the expression.

Research Question: the current study investigated two novel questions: 1) Can *manner* implicatures be primed? and 2) If so, is there cross-priming between *manner* and *quantity* implicatures? **Predictions:** The differences between *manner* and *quantity* implicatures mean that the grammatical approach does not predict any cross-priming between the two types. Unlike in the case of different subtypes of *quantity* implicature, the insertion of a grammatical operator **O** will fail to derive a *manner* implicature, as it will derive informationally stronger rather than similar alternatives (e.g. ‘*We O [moved our limbs to the music]*’ = we only literally moved our limbs to the music, i.e., we didn’t dance). As per a Gricean account, both *manner* and *quantity* implicatures only require consideration of the speaker’s cooperative intentions. Therefore, any type of implicature may lead to the priming of another type of implicature.

Experiment 1: aimed to investigate *manner* → *manner* priming effects. We recruited 180 adult monolingual English speakers. Exp.1's trials comprised of 30 trials: 6 target trials, 12 priming trials and 12 filler trials, presented in a *filler*→*filler*→*prime 1*→*prime 2*→*target* order. The trials were configured as per *trial 5*) in Fig.1, and both primes and trials involved *manner* implicature. **Results:** The mean rate of manner implicature in the target trials stood as 16.23% (SD = 12.34%); an increase of 4.37% from our preestablished baseline of 11.86% ($p = .0221$). The baseline rate of implicature, while low, is expected of one-off, context dependent phenomenon. A 4.37% increase from the baseline suggests that the *manner* primes primed implicature derivation in the subsequent target trials.

Experiment 2: after supplementary experiments reconfirming Bott & Chemla's assertion of *quantity* → *quantity* priming, we conducted a series of cross-priming experiments. The participant selection and paradigm structure were functionally identical to that of Exp.1, except *prime 1* and *prime 2* consisted of *quantity* primes (both *scalar* and *ad hoc*) and the target trials of *manner* implicatures (see Fig.1, *trials 3*) and 4) for *ad hoc* primes). **Results:** after *ad hoc* primes, we observed a mean rate of manner implicature of 18.04% in the target trials, an increase of 6.18% from the manner baseline ($p = 0.0022$). After *scalar* primes, we saw a mean implicature rate of 15.67% an increase of 3.78% from the manner baseline ($p = 0.0420$). Overall, the priming effect of *manner*, *scalar*, and *ad hoc* primes on *manner* targets is comparable – no single prime type outperforms the others.

Conclusions: Firstly, *manner* implicature is indeed primeable. While the formation of the experimental items was difficult due to the inherently ad-hoc, context-dependant nature of *manner* implicature, the data shows that priming paradigms can be used to investigate the nature of *manner* implicature. Secondly, the increase in *manner* implicature after *quantity* implicature primes has important ramifications for accounts that posit *quantity* implicature as a purely grammatical phenomenon as the observed cross-priming effect suggests that a shared derivational mechanism between *manner* and *quantity* implicature exists. While the presented data cannot rule out a grammatical component of *quantity* implicature, it certainly suggests that *quantity* implicature has similarities with *manner* implicature, and that these similarities are wholly pragmatic in nature.

Figure 1 - a trial set for Experiment 2's *ad hoc* primes

