

Title: Free Choice in Desire Ascriptions

We report two experiments investigating how natural-language disjunction ('or') is interpreted in the scope of desire attitude verbs ('want'). Our results provide evidence that both the distributive-acceptance reading (i.e., 'S wants p or q ' \Rightarrow 'S is fine with p ', 'S is fine with q ') and the free-choice reading ('S wants p or q ' \Rightarrow 'S wants p ', 'S wants q ') are robustly available. We argue that our results can be best explained by the non-ordering semantic accounts of 'want' reports (e.g., Blumberg & Hawthorne 2021) combined with Aloni's (2022) account of free choice.

As observed by many theorists, the natural-language disjunction licenses conjunctive inferences in certain types of embeddings, e.g., under possibility operators:

- (1) You are allowed to eat an apple or a pear.
 \Rightarrow You are allowed to eat an apple. (And you are allowed to eat a pear.)

Interestingly, the above 'free-choice' (FC) reading does not arise under necessity modals; still, the following sentences do licence a weaker conjunctive inference with 'may':

- (2) You must (= are required to) eat an apple *or* a pear.
 \Rightarrow You must eat an apple. (\Rightarrow And you must eat a pear.)
 \Rightarrow You *may* eat an apple. (And you *may* eat a pear.)

It is an important empirical question what kinds of embeddings actually licence FC or similar inferences. Experimental literature has confirmed the availability of FC-reading of 'or' in the contexts such as permissions, epistemic possibilities, and complex embeddings with modals and quantifiers (e.g., Van Tiel 2012, Chemla & Bott 2014). Our studies add to this line of research by investigating whether the following inferences are available:

- (3) Anne wants to travel to Paris or Rome.
 $\Rightarrow?$ (a) Anne wants to travel to Paris and (b) wants to travel to Rome.
 $\Rightarrow?$ (c) Anne is fine with travelling to Paris and (d) is fine with travelling to Rome.

Experiment 1: The participants completed an entailment task in which on each trial they saw a premise sentence and an inference candidate conclusion on the same screen and judged whether the conclusion followed from the premise (cf. Geurts, et al. 2010). The critical items contained disjunctions embedded under deontic modals or the desire verb 'want', and the corresponding conclusions expressing the FC/fine consequences (either with a conjunction, like 3a-and-b, or in a single-disjunct version, e.g., just 3a or just 3b). The remaining items were standard validity controls with conjunctions, conditionals, quantifiers, and presuppositions in which conclusion followed from the premise (valid controls) or it did not (invalid controls).

Results: Accuracy on the control items was high across the board (around 75-95% depending on the item type), indicating that participants understood the task. For desire ascriptions, both the FC- and the fine- conclusions were robustly endorsed (conjunctive conclusions: 'want': 66%, 'fine': 83%; single-disjunct conclusions: 'want': 84-88%, 'fine': 80-89%), comparable to the corresponding deontic-modal FC items and clearly higher than invalid controls ($p < 0.001$). Mixed-effects models show no reliable overall difference between desire ascriptions and deontic-modal sentences with respect to the FC inference acceptance level and response times.

Experiment 2: In the study, modelled after the one by Chemla & Bott's (2014), we used TVJ-tasks instead of inference-acceptance questionnaire. In the current design, the responses compatible with the FC readings of desire ascriptions were predicted to be false in light of the background story. The participants were presented with a story about two groups of inhabitants of an imaginary island. This setup enabled us to construct experimental and control sentences such as the following example:

SINGLE CONTROL (SC): Paul-the-Urbanite wants to eat a toffee.

DOUBLE CONTROL (DC): Patricia-the-Nomad wants to eat a fudge or a gingerbread.

EXPERIMENTAL: James-the-Urbanite wants to eat a fudge or a sausage.

Both types of control sentences had unambiguous truth-values by design (in the *DC* sentences, it was: true+true or false+false). The experimental sentences (true+false) were predicted to be true under the classical reading of 'or' and false under the FC/fine reading. The sentences were presented in segments in the centre of the screen and the judgement was made after the last segment.

Results: The participants generally correctly judged true control sentences as 'true' and their false versions as 'false'. The experimental sentences were judged on average as true in less than 50% of cases and they were accepted less often than true *DC* ($p < 0.001$) and true *SC* ($p < 0.001$) items and more often than control 'false' items (*DC*: $p < 0.001$, *SC*: $p < 0.001$). The analysis of RTs for control items revealed an expected pattern of correct responses being significantly faster than incorrect ones (*DC*: $p=0.005$, *SC*: $p=0.005$). On average, the target sentences were typically judged as 'false' slightly faster than as 'true'.

Discussion: The results of *Exp 1* show that the readings validating FC/fine inferences (i.e. 3a-b/3c-d) are available for desire ascriptions. The results of *Exp 2* strengthen this conclusion and additionally suggest that those readings are more basic than the one derived from logical disjunction, as responses consistent with them were produced faster. The results open up the issue of how the relevant readings can be explained by different semantic theories of 'want' combined with a suitable analysis of FC. On the ordering-based semantics (e.g. von Stechow 1999), 'S wants p ' is true iff all *top-ordered* worlds (i.e., worlds 'best' for *S* relative to his/her beliefs) are p -worlds. On the competitive approaches, 'S wants p ' is true iff p constitutes a 'good enough' alternative for *S*, not necessarily the best one (for different implementations of this idea, see Phillips-Brown 2021, Blumberg & Hawthorne 2021). To account for FC, we may try to appeal to the analysis of ' p or q ' as ' $\diamond p$ and $\diamond q$ ' (Zimmerman 2000, Geurts 2005). However, it is unclear how this analysis extends to desire predicates, in particular, how it would explain the elimination of the covert modal operator in 3a-b (i.e., how 'S wants $\diamond p$ and $\diamond q$ ' leads to 'S wants p and wants q '). Also, the pragmatic approaches that treat FC as a scalar implicature (e.g., Fox 2007) face a difficulty, as the calculation of the 'FC-implicature' makes use of modal laws that are not valid for 'want'. A more promising account is offered by Aloni (2022): ' p or q ' is pragmatically enriched in line with the 'non-zero-model' principle (NZ) to the effect that the disjunction – as interpreted relative to a set of worlds i – entails that i contains p -worlds and q -worlds. Applying NZ to the ordering analysis of 'S wants p or q ' yields the result that the best worlds include p -worlds and q -worlds, which means that 'S wants *not-p* / *not-q*' is false; this might explain the fine-inferences (3c-d). However, such an account still would not predict FC (3a-b). The non-ordering analysis, in turn, combined with NZ would imply that, for 'S wants p or q ' to be true, *there must be good enough p -alternatives and good enough q -alternatives*. This directly entails (3a-b). Thus, such an account would predict the full set of inferences for 'want'.

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