The Influence of Focus on Conditional Perfection

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Abstract Conditional Perfection (CP) is a widely studied but also controversially approached topic. This paper presents a replication of the study on the influence of focus on CP by Farr (2011). In the course of our experiment, the hypothesis by Farr regarding focus influencing CP was tested in an online-experiment. After a fourteen-day period of data collection the results were analyzed. As expected, the results showed that if focus is present, CP occurs significantly more often as compared to cases without focus on the antecedent.

1 Introduction

CP is described by many researchers as the interpretation of a conditional sentence as a biconditional if specific conditions are met (van der Auwera 1997, Cariani & Rips 2016, Farr 2011, Herburger 2016). Those conditions cover the inference, as shown in (1), from an utterance (1-a) to either utterance (1-b) or (1-c).

(1) a. If you sleep enough, you will be rested tomorrow.
b. Only if you sleep enough, you will be rested tomorrow.
c. If you do not sleep enough, you won't be rested tomorrow.

As von Fintel (2001) notes, *if p, q*, *if not p, not q*, and *if and only if p, q* are part of the meaning conveyed by sentences with CP. Even though Horn (2000) concludes his paper by saying that he spoke the last words on CP and hence, according to his view, everything is said, there are still other observations and other research regarding CP.

As an example, Farr furthermore investigates CP, as a pragmatic phenomenon and as a scalar and quantity implicature.

1.1 Pragmatic Phenomenon

Farr (2011) argues that in order to not change the semantics of the present conditionals, it has to be assumed that CP is a pragmatic rather than a semantic phenomenon.

One evidence is the use of Biscuit Conditionals (BC) (Sano & Hara 2015, Siegel 2006, Farr 2011). BC are described by Elder (2019) as a special form of conditionals,

where consequent and antecedent are conditionally independent. Farr also states that those conditionals arise in two conditionally unrelated statements as in (2).

(2) a. If you are hungry, there is food on the table.
b. If you are not hungry, there is no food on the table.

Whether or not there is food on the table has nothing to do with the hunger of the addressee (Siegel 2006). Therefore, as Farr states too, (2-a) and (2-b) are unrelated and no inference is invited. That is, the antecedents (i.e., '*If you are hungry*' and '*If you are not hungry*') are independent from their respective consequents (i.e., '*there is food on the table*' and '*there is no food on the table*'). As furthermore noted by von Fintel (2011) BC do not specify any condition inferring the truth of the consequence.

Another evidence pointed out is that there exists a usually cancelable inference between conditionals such as in (3).

(3) a. If study for the exam, you will pass the course.
b. But also if you do all homework.

The introduction of a second condition for passing the course (i.e., the condition in (3-b)), cancels the inference in (3-a) such that is does not remain the only condition fulfilling the requirement.

The aforementioned statements are listed by Farr to underline the hypothesis that CP falls under the category of pragmatic inferences.

1.2 Scalar Implicature

Implicatures are described by Papafragou & Skordos (2016) as the parts of the meaning that are meant but not directly said such as in (4-a)—where (4-a) implies (4-b), otherwise the utterance present in (4-a) wound not be informative enough (Spychalska et al. 2016). The term 'scalar' moreover only adds a scale of information such as the quantifiers *some* and *all* as shown in (4). Additionally, both truths are compatible with one another since the meaning of *some* infers that possibly *all* things are meant (Spychalska et al. 2016). Scalar implicatures (SIs) can therefore be drawn from the amount of expressed information Farr (2011).

(4) a. Peter did some homework.
b. Peter did not do all homework.

In (4) the SI is present in (4-b) with an informational scale from *all* and *some* (Papafragou & Skordos 2016). Furthermore, the usage of *some* in (4-a) is interpreted as '*not all*' (Panizza & Chierchia 2011) and the implicature can directly be canceled if another phrase is added stating that Peter did do all homework. Nevertheless,

the utterance of the weaker statement, containing *some*, expresses the fact that the speaker does not actually believe in the stronger statement (Farr 2011, Papafragou & Skordos 2016). This would then be the opposite effect of what is happening in CP Farr (2011).

In order to state that CP is no SI, Farr discussed the attempts of Atlas & Levinson (1981), van der Auwera (1997), and Horn (2000).

Farr criticises Atlas & Levinson (1981)'s scale showing that *if and only if p, q* is the stronger statement to *if p, q*. Reasons for this are the complexity of the statement placed on top (i.e., *if and only if p, q*), as well as the fact that other scalar terms such as those discussed above (i.e., *some but not all*) exclude the given statement and hence the same should happen for CP.

Furthermore, the attempt by van der Auwera (1997) shown in Table 1 is ruled out due to its weakness. Farr states that for every antecedent in a statement, it would have to be justified that they will not cause q which is not suitable to present the argumentation in the context of CP.

	...
	if p, q and if r, q and if s, q
	if p, q and if r, q
↑	*if p, q*

Table 1 van der Auwera (1997)'s approach (cf. Farr (2011))

Lastly, (Horn 2000) proposes an approach based on pragmatic strengthening (cf. Table 2).

	q /Whatever the case, q
↑	*if p, q*

Table 2 Horn (2000)'s approach (cf. Farr (2011))

According to Farr, this proposal only shows that q is no absolutely true, but leaves out whether there exist conditions yielding the truth of q.

Therefore, the above-mentioned examples conclude that CP is no SI.

1.3 Quantity Implicature

Farr furthermore states that CP is a quantity implicature (QI) following van Rooij & Schulz (2004)'s and Schulz & Rooij (2006)'s theory of a *closed world assumption* for an exhaustive reasoning using minimal models.

(5) a. Q: Who eats?
A: Gregory and Maisy eat.
b. Gregory and Maisy but no one else eats.

M_1	M_2
Individuals = {Gregory, Leo, Maisy, Ted}	Individuals = {Gregory, Leo, Maisy, Ted}
$[\![\text{eat}]\!]^{M_1}$ = {Ted}	$[\![\text{eat}]\!]^{M_2}$ = {Leo}
M_3	M_4
Individuals = {Gregory, Leo, Maisy, Ted}	Individuals = {Gregory, Leo, Maisy, Ted}
$[\![\text{eat}]\!]^{M_3}$ = {Gregory, Maisy}	$[\![\text{eat}]\!]^{M_4}$ = {Gregory, Maisy, Leo}

Table 3 Minimal models following the examples given by Farr (2011)

Table 3 shows potential models for the given context in (5-a) while only M_3 provides the desired exhaustive interpretation such that this is the only model where the result is comprehensively, i.e., exhaustively, true (Marty & Romoli 2022). Attention is furthermore drawn to the focus, i.e., that exhaustification only applies to the focused terms. In (5-a), where the question-word is *who*, the focus lies on the protagonists, i.e., Gregory and Maisy performing the act of eating. For a question like *What do Gregory and Maisy do?* the focus would be placed on the act of eating. This in turn leads to different models being minimal for various backgrounds (Farr 2011).

1.4 Conditional Perfection Predictions

The above-mentioned examples pose different conditions and predictions for CP. Following the last point mentioned, referring to QI, CP is related to exhaustification and hence minimal models. This stresses the exhaustificational and non-exhaustificational interpretation of contexts.

Referring to the example given in Table 4, the following contexts would be part of the interpretation of focus.

(6) a. Friend: What happens if you have an A average?
b. Marie: If I have an A average, **I get 50€**.

(7) a. Friend: When will you get 50€?
b. Marie: **If I have an A average**, I get 50€.

The situation given in (6) (i.e., the '*what-if-p*'-condition) puts the focus on the consequent (marked in bold). The corresponding minimal model would simply contain a situation where reaching the A average only results in earning 50€. In the

situation in (7) (i.e., the '*when-q*'-condition) instead, the focus lies on the antecedent (marked in bold) which means the minimal model refers to a situation in which 50€ are only earned with an A average—in this case CP is expected.

2 Experiment

The purpose of the experiment was to replicate the study conducted by Farr (2011) and to investigate the corresponding assumption that focus influences CP.
While Farr discusses two different experimental designs in her publication—namely a first experiment in the form of a felicity judgment task (FJT) and a follow-up experiment conducted as a truth-value judgment task (TVJT)—we only focus on the TVJT replication. Farr already notes in the discussion that the percentage of answers indication CP in the FJT experiment is higher than in the TVJT. Therefore, we aim at concluding the TVJT with the same result as Farr—namely that focus influences the presence of CP.

An FJT aims at the simple judgment whether the given answer is sufficient and hence proposes a simple way of answering question-answer-pairs (Farr 2011, Schaeken et al. 2019). The TVJT instead differs in the construction of the questions such that the participants have to label sentences as *true* or *false* which seems to be more challenging (Zondervan 2009).

The present TVJT experiment consisted of six minimal context pairs representing an everyday situation and only differing in the question posed. Following Farr's experimental design, the questions were asked in the form *what-if-p* or *when-q*, i.e., the German counterparts *was-wenn-p* or *was-falls-p* and *wann-q* respectively. Moreover, the questions following the *when-q*-condition did not contain temporal markers in any case to raise a conditional reading (cf. (Farr 2011)). This should make sure to not confuse the reader, i.e, contexts following the construction 'If p, q' should not surprise the reader.

The survey contained six test items[1] which were split into two parts with three items asking *what-if-p* questions, the other three *when-q* questions.

Table 4 shows an example for a context followed by the corresponding question used in the experiment[2]. In the given example construction, the antecedent is present in the phrase '*If I have an A average*', i.e., the *p*-part of the *what-if-p*-construction, while the consequence is represented as the phrase '*I get 50€*', i.e., the *q*-part of the *when-q*-construction.

1 The original items can be found in appendix A, tables 7-12

2 The contexts given in Table 4, Table 5, and Table 6 are only direct translations of the real context and question—the original items were still given in German. One of the contexts used was a translation of the example given by Farr.
The real contexts can be found in appendices A, B, and C.

No further distinction was made between questions posed in German with *was-wenn-p* or *was-falls-p* constructions. Whether or not a subject received a question with either *what-if-p* or *when-q* construction was randomly assigned.

Marie is about to graduate from elementary school. Marie's grandfather has promised her that she will receive 50€ if she gets an A average. When Marie visits her aunt, the two negotiate that if she gets an A average, they will go on a trip to the amusement park together, and if she gets a B average, Marie will get 50€ as a gift.

Her best friend curiously asks Marie about the reward.

what-if-p	*when-q*
Friend: What happens if you have an A average?	Friend: When will you get 50€?

Marie: If I have an A average, I get 50€.

Is Marie's answer true? [Yes] [No]

Table 4 Example for test item with both *what-if-p* and *when-q* answer

Furthermore, six fillers[3] were provided checking whether the subjects in general understood the conditional answer to the proposed question—three of those fillers were *conditional fillers*, three were *exhaustification fillers*. Compared to the test items, the conditional fillers contained only one antecedent for each consequent present in the text. True fillers correctly corresponded to the situation described in the context, while false fillers gave the wrong antecedent for the given consequence. The items were shuffled in a way that no more that two test items and two fillers were presented in a row.

Table 5 gives an example situation for a conditional filler. As shown in the given example, the response '*If Anna comes with us, we watch a horror movie*' clearly gives the wrong antecedent, since Anna does not like horror movies.

The fillers were intentionally provided with clear statements to ensure the effect they should have to check whether subjects understand conditional readings properly.

3 The original fillers can be found in appendices B and C, tables 13-15 and 16-18 respectively.

Ahmad, Stephan and Elena want to go to the cinema together. Anna would also like to come, but she can only confirm or cancel tomorrow. There is a choice between a comedy and a horror film. Anna hates horror movies and the group has agreed that they will watch a horror movie without Anna and choose the comedy with Anna. Stephan asks again.

Stephan: When do we watch the horror movie?

true	*false*
Ahmad: If Anna doesn't come to the, movies with us we watch a horror movie.	Ahmad: If Anna comes with us, we watch a horror movie.

Is Ahmad's answer true? [Yes] [No]

Table 5 Example for conditional filler with both *true* and *false* answer

Rachel is a big fan of her home soccer club, which currently plays in the 2^{nd} league. But she rarely goes to games, they are often too boring for her in the 2^{nd} league. However, if her club were to be relegated, she would show solidarity and buy a season ticket for the stadium in support. Rachel hopes that her club will eventually be promoted to the 1^{st} league. She would also buy a season ticket then, because games in the Bundesliga are bigger and the atmosphere in the stadium is more exciting. Her friend inquires with Rachel.

Friend: When are you going to buy a season ticket?

true	*false*
Rachel: Only if the club is promoted or relegated I buy a season ticket.	Rachel: Only if the club gets promoted, I will buy a season ticket.

Is Rachel's answer true? [Yes] [No]

Table 6 Example for exhaustification filler with both *true* and *false* answer

Table 6 furthermore shows an exemplary situation for an exhaustification filler.

Exhaustification fillers contained two conditions leading to the same consequent. In the true filler, both condition are provided while in the false filler only one condition is given.

Furthermore, the distribution of true and false fillers was evenly distributed with three true and three false fillers.

On every separate question, the participants were asked to simply answer the question in a TVJT manner, i.e., judge whether the given statement appropriately describes the situation described in the context (*true* or *false*) (Gordon & Crain 2005).

2.1 Experimental Procedure

As in the original experiment by Farr (2011), the experiment was carried out in German. Overall, the experiment took around 15 minutes in total—the subjects were nevertheless free to process the study in their own pace.

A blinding in form of a within-participants manipulation was used without any form of information about this manipulation. Furthermore, the participants who took part in the experiment received a link[4] to the experiment conducted in an online environment. There was no direct contact between experimenters and subjects.

In addition, the experiment was designed within-subjects with one factor, but two levels of the question type (i.e., *when-q* and *what-if-p*). Moreover, the items were pseudo-randomized beforehand such that no more than two fillers or test items appeared consecutively and the question types '*when-q*' and '*what-if-p*' were assigned pseudo-randomized per test item. Nevertheless, all participants saw all experimental items of one sort, i.e., there were 12 items per subject—six fillers and six test items. Participants received three items of each construction, i.e., three '*what-if-p*'-fillers, three '*when-q*'-fillers, three conditional fillers, and three exhaustification fillers. None of these items contained the same context.

Moreover, there was no option for participants to skip a question, and hence leave it unanswered, but still submit their responses to the remaining items.

The first two slides of the experimental setup contained general information regarding the procedure and written instructions for the proceeding of the whole experiment. Other than in the original paper, no oral instructions were given since the experiment was completed online only. Inside the questionnaire itself, there were four steps per slide. With the first click on each slide, the text describing the experimental situation appeared. The second and third click revealed the internal question and answer respectively. In the last step, the overall true-false-answer appeared. Every information appearing on the slide lasted until the question was answered. At the end of the whole experiment, participants were provided with a slide asking for background information on knowledge of logic and pragmatics as well as whether the participants were native speakers of German. In addition, there was a text field for comments or feedback.

4 https://zen-dubinsky-bd6191.netlify.app/

Furthermore, data collection was stopped at midnight of the 14^{th} day after starting the collection through announcements via email.

2.2 Participants and Preprocessing

All participants were contacted privately and did not receive any compensation. Additionally, no restriction on age, profession, gender, sexuality or anything else was made. Participants were allowed to take part only once. There were 58 participants in total.

Prior to the final analysis the participants' data was checked for exclusion of individual subjects or items. First of all, eight subjects were excluded since they were no German native speakers—those participants were not further inspected. Being a native speaker of German was important for us since the given contexts and the underlying logic might be difficult to realize for non-native speakers.

Moreover, six participants were excluded due to prior knowledge of logic or logic and pragmatics. No participant stated prior knowledge in pragmatics without logic. Those two conditions were chosen to minimize the possibility of participants figuring out the logic behind the questions and thus skewing the results. After excluding subjects falling under the aforementioned conditions, no further participants had to be excluded due to responding incorrectly to three or more fillers. In addition, a time restriction was set internally such that items answered in less than 10s, independent of the participant, were precluded too. Due to this restriction, no items were ruled out which showed us that the participants recruited took the experiment seriously.

Finally, the data of 44 subjects and hence 264 items were evaluated.

2.3 Analysis Procedure

The question type of each test item was manipulated and treated as a 2-level factor with the default/reference level as '*when-q*'. It was furthermore measured whether the given answer to the TVJT was *positive* or *negative*, i.e., '*yes*' or '*no*'. That is, the correctness is tested against the condition, such that the response depends on the question type.

The data was analyzed with a Bayesian Logistic Regression model using the '*brms*' package (Bürkner 2018). The corresponding independent variable was assigned to the question type (i.e., '*when-q*' and '*what-if-p*') to analyze the effect on the dependent binary variable representing the response on the TVJT given by each participant (i.e., '*yes*' and '*no*').

2.4 Results

The analysis showed that CP arose (i.e., a negative response was given) in 46 % of the *when-q* contexts and 25 % in the *what-if-p* contexts.

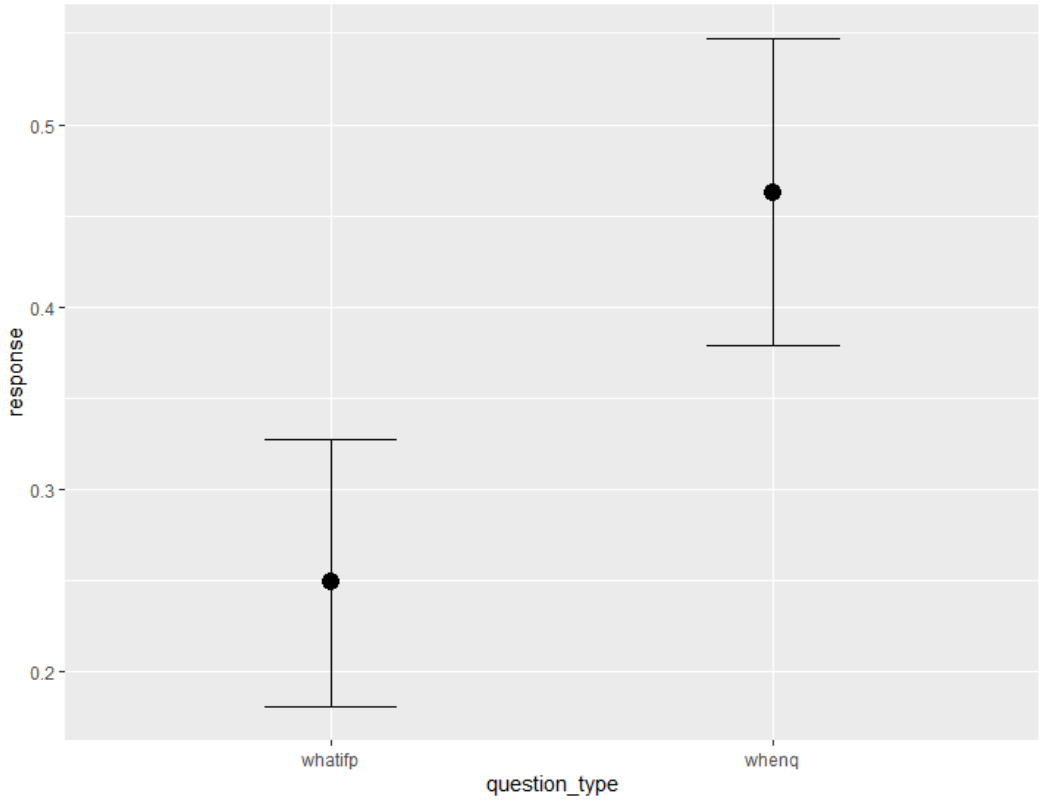

Figure 1 Marginal effects

Figure 1 shows the marginal effects representing the probability of negative responses.

There were 31 % of participants classifying the corresponding answers as false, i.e., responding with '*no*', only in the given '*when-q*'-contexts and never within the '*what-if-p*' questions. In addition, 56 % were more likely to describe responses as inadequate in '*when-q*'-contexts than in '*what-if-p*'-contexts. There were still 20 % participants responding equally frequent with '*no*' in both of the given conditions. Furthermore, after reviewing the data, there was no evidence that CP occurred more frequently or purely in '*what-if-p*'-contexts.

Figure 2 shows the densities of the parameter estimates. The first plot on the top left refers to the negative responses in the '*what-if-p*'-condition. The point estimate is

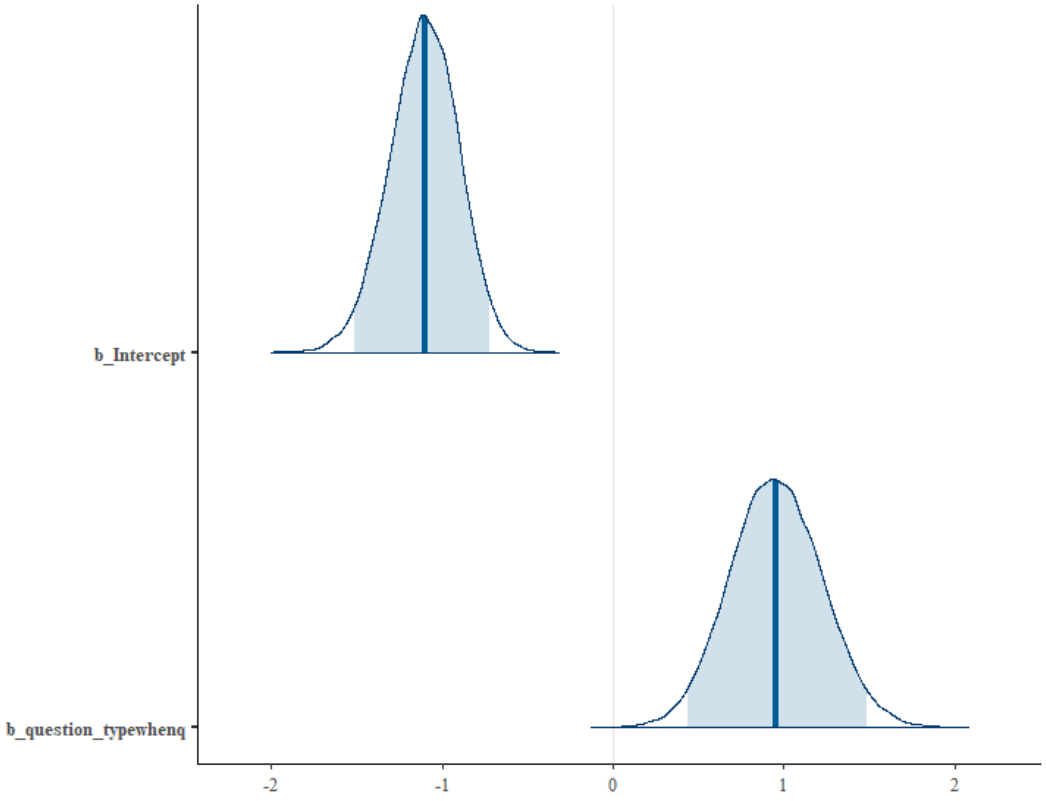

Figure 2 Parameter Estimates

around -1.11 while the lower and upper 95 % credibility intervals (CI) are -1.51 and -0.72 respectively. Since the plot is positioned below 0, it shows that the '*what-if-p*'-cases are less likely to result in a '*no*' response. The plot for the '*when-q*'-condition shows the opposite. The corresponding point estimate already is above zero, i.e., 0.96, and the lower and upper 95 % CI are positioned on 0.44 and 1.49 respectively. Therefore, since the whole plot is placed above zero, it is clearly shown that in comparison to the '*what-if-p*' questions, the question type '*when-q*' is more likely to result in a '*no*' response, i.e., letting CP arise.

Moreover, the analysis showed that the posterior probability exceeds the 95 % interval and therefore gives strong evidence for the truth of the hypothesis. Following this analysis, there is reason to believe that the number of '*no*' responses in the '*when-q*' questions is significantly higher than in the '*what-if-p*' questions and hence fits with the results of Farr's original study.

2.5 Discussion

The results clearly indicate, and therefore underline the results by Farr, that focus indeed influences the rise of CP. Even though the results are not that diverse as they are in Farr's study, they are still significant and prove the hypothesis.

However, there are some possible reasons, other than proper evidence, leading to the results. Since Farr did not include any direct examples provided in German, it was not clear from the paper whether she used *richtig* or *wahr* as the translation of *true*. We decided to use the term *wahr* for our study—nevertheless, some participants seemed to be confused by this wording. Judging from the feedback provided in the end, subjects were confused by this choice of wording and interpreted the meaning of *wahr* differently as they would have with *richtig*. Some participants argued that it was hard to judge whether the question should be answered true or false referring to the word *wahr* (i.e., whether the response given by one of the interlocutors is true) since the answer was not complete. Therefore, some subjects were insecure whether the answer corresponding to the context is true if there is not all information given.

Furthermore, some participants argued that the instructions were not clear enough and it was hard to judge what to do[5]. Farr (2011) herself argues that it might be more common to judge whether the answer is *sufficient* or *appropriate* instead of a true- or false-judgment. Even though the results match the hypothesis and follow the results by Farr, it might be the case that subjects judged the responses as false referring to the missing information, i.e., missing information led to classifying the response as false.

As previously stated, participants with knowledge in logic were excluded since they could have prior information on the interpretation of logical sentences (Crain et al. 2000). This assumption was briefly tested by running the same model on the five remaining participants with prior knowledge in logic[6]. The analysis showed that there were 40 % responses with 'no' *only* in '*when-q*'-contexts and 60 % of the remaining five participants were *more likely* to respond with 'no' in '*when-q*'-contexts. There was still one person answering equally likely with 'no' in both situations. Moreover, the brms-analysis showed 20 % and 40 % negative responses what-if-p and when-q contexts respectively.

Judging from those results, there is no huge impact on the results by people with prior logical knowledge. The expectations were the opposite such that the negative responses in '*when-q*'-contexts should be higher.

Nonetheless, it has to be noted here that we did not state that logic refers to formal logic and possible logic introductory courses but not only logical thinking in general.

5 The instructions only stated to classify the given response as true or false. No further information on the procedure or intention was given.

6 One participant had to be excluded due to answering three or more fillers incorrectly.

Therefore, it could be the case that the logical knowledge does not infer the ability to infer the logic behind the sentences and hence label sentences in 'when-q'-contexts as negative.

Farr excluded two subjects with prior knowledge in implicature theory in their TVJT without any further note on a possible assumption. Unfortunately, only one participant in our data stated to have knowledge in pragmatics, and only in combination with logic, which made it impossible to account for and test any variation referring to this knowledge.

3 Conclusion

As expected, this work proves the given hypothesis by Farr on the influence of focus on CP. This concludes that the assumption by von Fintel (2001) that CP can be interpreted as a QI in accordance with the interpretation of exhaustivity (Marty & Romoli 2022, van Rooij & Schulz 2004, Schulz & Rooij 2006) is indeed one that holds. Compared to the non-focused condition the amount of 'no' responses in the present study in the focused condition was significantly higher and hence shows that CP arises more frequently within the focus on the antecedent, i.e., the '*when-q*'-condition. Nonetheless, to verify the misleading interpretation of *richtig* and *wahr*, a follow-up experiment should be conducted to check whether it has an impact on the responses and hence on the result. Moreover, it would have been interesting to inspect the impact of pragmatics knowledge on the interpretation of those conditions too, since Farr herself didn't make any assumptions about this claim.

References

Atlas, Jay David & Stephen C. Levinson. 1981. It-clefts, informativeness and logical form: Radical pragmatics (revised standard version). In Peter Cole (ed.), *Radical pragmatics*, New York: Academic Press.

van der Auwera, Johan. 1997. Conditional perfection. In Angeliki Athanasiadou & Rene Dirven (ed.), *On conditionals again*, John Benjamins Publishing Company.

Bürkner, Paul-Christian. 2018. Advanced Bayesian multilevel modeling with the R package brms. *The R Journal* 10(1). https://doi.org/10.32614/RJ-2018-017.

Cariani, Fabrizio & Lance Rips. 2016. Experimenting with (conditional) perfection. https://doi.org/10.13140/RG.2.2.12049.22880.

Crain, Stephen, Andrea Gualmini & Luisa Meroni. 2000. The acquisition of logical words. *LOGOS and Language* 1.

Elder, Chi-He. 2019. *Biscuit conditionals, conditional speech acts and speech-act conditionals*. https://doi.org/10.1007/978-3-030-13799-1_3.

Farr, Marie-Christine. 2011. Focus influences the presence of conditional perfection: Experimental evidence. In *Proceedings of sinn & bedeutung*, Universaar - Saarland University Press.

von Fintel, Kai. 2001. Conditional strengthening [a case study in implicature] .

von Fintel, Kai. 2011. Conditionals. In Klaus von Heusinger, Claudia Maienborn & Paul Portner (eds.), *Semantics: An international handbook of meaning*, vol. 2, de Gruyter Mouton.

Gordon, Peter C. & Stephen Crain. 2005. The truth-value judgment task 10.1 the nature and history of the truth-value judgment task. In *Methods for assessing children's syntax*, Cambridge, Mass: MIT Press.

Herburger, Elena. 2016. Conditional perfection: the truth and the whole truth. *Semantics and Linguistic Theory* 25. https://doi.org/10.3765/salt.v25i0.3079.

Horn, Laurence. 2000. From if to iff: Conditional perfection as pragmatic strengthening. *Journal of Pragmatics* 32. https://doi.org/10.1016/S0378-2166(99)00053-3.

Marty, Paul & Jacopo Romoli. 2022. Presupposed free choice and the theory of scalar implicatures. *Linguistics and Philosophy* 45. https://doi.org/10.1007/s10988-020-09316-5.

Panizza, Daniele & Gennaro Chierchia. 2011. Numerals and scalar implicatures. In Jörg Meilbauer & Markus Steinbach (eds.), *Experimental pragmatics/semantics*, John Benjamins.

Papafragou, Anna & Dimitrios Skordos. 2016. Scalar implicature. In Jeffrey Lidz, William Snyder & Joe Pater (eds.), *The oxford handbook of developmental linguistics*, Oxford University Press.

van Rooij, Robert & Katrin Schulz. 2004. Exhaustive interpretation of complex sentences. *Journal of Logic, Language and Information* 13(4). https://doi.org/10.1007/s10849-004-2118-6.

Sano, Katsuhiko & Yurie Hara. 2015. Conditional independence and biscuit conditional questions in dynamic semantics. *Semantics and Linguistic Theory* 24. https://doi.org/10.3765/salt.v24i0.2417.

Schaeken, Walter, Bojoura Schouten & Kristien Dieussaert. 2019. Development of quantitative and temporal scalar implicatures in a felicity judgment task. *Frontiers in Psychology* 9. https://doi.org/10.3389/fpsyg.2018.02763.

Schulz, Katrin & Robert Rooij. 2006. Pragmatic meaning and non-monotonic reasoning: The case of exhaustive interpretation. *Linguistics and Philosophy* 29. https://doi.org/10.1007/s10988-005-3760-4.

Siegel, Muffy. 2006. Biscuit conditionals: Quantification over potential literal acts. *Linguistics and Philosophy* 29(2). https://doi.org/10.1007/s10988-006-0003-2.

Spychalska, Maria, Jarmo Kontinen & Markus Werning. 2016. Investigating scalar implicatures in a truth-value judgement task: evidence from event-related brain potentials. *Language, Cognition and Neuroscience* https://doi.org/10.1080/

23273798.2016.1161806.
Zondervan, Arjen. 2009. Experiments on qud and focus as a contextual constraint on scalar implicature calculation. In Ulrich Sauerland & Kazuko Yatsushiro (eds.), *Semantics and pragmatics: From experiment to theory*, Palgrave Macmillan.

A Items

Ein Angeklagter, der des Bankraubes beschuldigt wird, berät sich mit seiner Anwältin. Er kennt sich mit dem Strafmaß für die unterschiedlichen Tatbestände nicht aus. Seine Anwältin zählt ihm die verschiedenen Höchststrafmaße auf. Auf Raub stehen zwei Jahre Höchststrafe, auf Körperverletzung stehen zwei Jahre, auf Raub mit Körperverletzung entfallen drei Jahre, und für Diebstahl eine Strafe von maximal einem Jahr auf Bewährung.

Um sicher zu gehen, dass der Angeklagte alles richtig im Kopf hat, will er sich nochmal versichern.

what-if-p	*when-q*
Angeklagter: Was passiert, wenn ich für Körperverletzung verurteilt werde?	Angeklagter: Wann gehe ich für maximal zwei Jahre ins Gefängnis?

Anwältin: Falls Sie für Körperverletzung verurteilt werden, gehen Sie maximal zwei Jahre ins Gefängnis.

Ist die Antwort der Anwältin wahr? [Ja] [Nein]

Table 7 Original item with both *what-if-p* and *when-q* answer

Familie Stein will kommenden Sommer nach Spanien in den Urlaub fahren, aber nur, falls in Spanien bis dahin keine neue Variante des Coronavirus auftaucht. Andernfalls bleiben sie in Deutschland. Außerdem wollen sie auch dann in Deutschland Urlaub machen, wenn man bei der Rückreise aus dem Ausland in Quarantäne muss.

Nachdem die Familie nach wochenlangem Hin und Her zu dieser Entscheidung gekommen ist, fragt der jüngste Sohn noch einmal nach.

what-if-p	*when-q*
Sohn: Was machen wir, wenn in Spanien eine neue Coronavirus-Variante auftaucht?	Sohn: Wann bleiben wir in Deutschland?

Eltern: Falls in Spanien eine neue Coronavirus-Variante auftaucht, bleiben wir in Deutschland.

Ist die Antwort der Eltern wahr? [Ja] [Nein]

Table 8 Original item with both *what-if-p* and *when-q* answer

Lena ist Studentin und arbeitet nebenbei in einem Restaurant. Durch die Coronapandemie und die Schließung der Gastronomie hatte sie Schwierigkeiten ihr Studium ausreichend zu finanzieren. Ihr Chef weiß um diese Situation und macht Lena einen Vorschlag. Wenn die Schließung in der Gastronomie anhält, kann Lena an drei Stunden die Woche auf seine Kinder aufpassen. Dafür bekommt sie 30€. Alternativ kann Lena Putzdienste im Restaurant übernehmen und verdient so zusätzlich 30€.

Sie erzählt ihrer Mutter von diesen Angeboten, die daraufhin mit Lena darüber spricht.

what-if-p	*when-q*
Mutter: Was für ein Angebot hat dein Chef gemacht, sollte die Coronapandemie andauern?	Mutter: Wann bekommst du 30€?

Lena: Falls die Coronapandemie andauert, kann ich drei Stunden pro Woche auf die Kinder meines Chefs aufpassen und bekomme dafür 30€.

Ist Lenas Antwort wahr? [Ja] [Nein]

Table 9 Original item with both *what-if-p* and *when-q* answer

Marie steht bald vor dem Abschluss der Grundschule. Maries Opa hat ihr in Aussicht gestellt, dass sie bei einem Einser-Durchschnitt 50€ bekommt. Als Marie bei ihrer Tante zu Besuch ist, handeln die beiden aus, dass die beiden bei einem Einser-Durchschnitt gemeinsam einen Ausflug in den Vergnügungspark machen und Marie bei einem Zweier-Durchschnitt 50€ geschenkt bekommt.

Ihre beste Freundin fragt Marie neugierig nach der Belohnung.

what-if-p	*when-q*
Freundin: Was passiert, falls du einen Einser-Durchschnitt hast?	Freundin: Wann bekommst du 50€?

Marie: Falls ich einen Einser-Durchschnitt habe, bekomme ich 50€.

Ist Maries Antwort wahr? [Ja] [Nein]

Table 10 Original item with both *what-if-p* and *when-q* answer

Max Müller möchte einen Hund aus dem Tierheim haben. Ein Mitarbeiter des Tierheims klärt ihn auf, dass es vorkommt, dass ein Hund in einem neuen Zuhause nicht gut behandelt wird. In diesem Fall wird der Hund zurück ins Heim gebracht. Außerdem wird ihm gesagt, er soll sich gut überlegen, was er für einen Hund möchte, da Hunde unterschiedliche Bedürfnisse haben. Sollte die Verbindung zum Hund nicht ausreichen, muss Max das Tier zurückbringen.

Um nichts falsch zu machen, fragt Max am Schluss der Unterhaltung nochmals nach.

what-if-p	*when-q*
Max: Was passiert, wenn ich dem Hund kein gutes Zuhause bieten kann?	Max: Wann muss der Hund zurück ins Heim?

Mitarbeiter: Wenn Sie dem Hund kein gutes Zuhause bieten können, muss der Hund zurück ins Heim.

Ist die Antwort des Mitarbeiters wahr? [Ja] [Nein]

Table 11 Original item with both *what-if-p* and *when-q* answer

Peter würde gern ein eigenes Haus besitzen. Dafür braucht er von seiner Bank einen Kredit. Er sucht aktuell nach einem Haus, das er kaufen könnte. Peter hat seinem Bankberater mitgeteilt, dass er selbst bauen möchte, sollte er kein passendes Haus zum Kaufen finden. Nun ist Peters Onkel gestorben, der unter anderem auch ein Grundstück an Peter und seine zwei Geschwister vererbt hat. Er will auch dann selbst ein Haus bauen, sollte er das freie Grundstück seines Onkels bekommen.

Sein Bankberater erkundigt sich bei Peter nochmal, wie die Situation aussieht.

what-if-p	*when-q*
Bankberater: Was machen Sie, falls Sie kein passendes Haus zum Kaufen finden?	Bankberater: Wann wollen Sie selbst ein Haus bauen?

Peter: Falls ich kein passendes Haus zum Kaufen finde, werde ich selbst bauen.

Ist Peters Antwort wahr? [Ja] [Nein]

Table 12 Original item with both *what-if-p* and *when-q* answer

B Conditional Fillers

Ahmad, Stephan und Elena wollen gemeinsam ins Kino. Anna würde auch gerne kommen, kann aber erst morgen sicher zu- oder absagen. Zur Auswahl stehen eine Komödie und ein Horrorfilm. Anna hasst Horrorfilme und die Gruppe hat sich geeinigt, dass sie ohne Anna einen Horrorfilm schauen werden und mit Anna die Komödie wählen.
Stephan fragt nochmal nach.

Stephan: Wann schauen wir einen Horrorfilm?

true	*false*
Ahmad: Wenn Anna nicht mit ins Kino kommt, schauen wir einen Horrorfilm.	Ahmad: Wenn Anna mitkommt, schauen wir einen Horrorfilm.

Ist Ahmads Antwort wahr? [Ja] [Nein]

Table 13 Original conditional filler with both *true* and *false* answer

Herr Hartmann ist schon lange Angestellter in einem Chemieunternehmen. Er hat nun aber ein lukratives Angebot eines Pharmaunternehmens erhalten, das ihn schon zum nächsten Monat einstellen möchte. Herr Hartmann hat allerdings eine Kündigungsfrist von 6 Monaten. Da sein derzeitiger Chef ihm entgegenkommen möchte, bietet er ihm an, die Kündigung zum nächsten Monat zu akzeptieren, wenn Herr Hartmann auf seinen Jahresbonus verzichtet.
Bevor er zusagt, möchte sich Herr Hartmann erst mit seiner Frau besprechen.

Frau Hartmann: Wann akzeptiert dein Chef die Kündigung schon zum nächsten Monat?

true	*false*
Hr. Hartmann: Wenn ich nur die Hälfte des Jahresbonus annehme, akzeptiert mein Chef die Kündigung schon zum nächsten Monat.	Hr. Hartmann: Wenn ich den Jahresbonus ablehne, akzeptiert mein Chef die Kündigung schon zum nächsten Monat.

Ist Herr Hartmanns Antwort wahr? [Ja] [Nein]

Table 14 Original conditional filler with both *true* and *false* answer

Samira studiert Linguistik im Bachelor und hat in den kommenden Wochen einige Klausuren vor sich. Um sich einen Plan zu erstellen, teilt sie sich die Tage auf und lernt montags und donnerstags für ihre Phonologie-Klausur und dienstags und freitags für die Logik-Klausur. Falls sie mittwochs nicht arbeiten muss, kann sie noch ein zusätzliches Logik-Tutorium am Abend belegen.
Ihr Kommilitone Leon würde gerne mit Samira zusammen lernen und fragt nach ihren Plänen.

Leon: Wann belegst du das Tutorium in Logik am Mittwochabend?

true	*false*
Samira: Wenn ich mittwochs nicht arbeiten muss, belege ich das Logik-Tutorium am Mittwochabend.	Samira: Wenn ich montags nicht arbeiten muss, belege ich das Logik-Tutorium am Mittwochabend.

Ist Samiras Antwort wahr? [Ja] [Nein]

Table 15 Original conditional filler with both *true* and *false* answer

C Exhaustification Fillers

Monika verkauft Fisch und Meeresfrüchte auf dem Markt. Sie bekommt 1€ für eine Jakobsmuschel, 2,50€ für eine Scholle, 15€ für einen Hummer und 2,50€ für einen Hecht. Kerstin, Monikas Angestellte, kann sich die Preise nicht merken.
Da sie Monika nicht schon wieder fragen will, wendet sie sich an Martin, der ebenfalls für Monika arbeitet und die Preise genau kennt.

Kerstin: Wann bekomme ich 2,50€?

true	*false*
Martin: Nur wenn du eine Scholle verkaufst, bekommst du 2,50€.	Martin: Nur wenn du eine Scholle oder einen Hecht verkaufst, bekommst du 2,50€.

Ist Martins Antwort wahr? [Ja] [Nein]

Table 16 Original exhaustification filler with both *true* and *false* answer

Sinem liebt es zu reisen und neue Orte zu entdecken. Sie ist Deutschlehrerin und würde sehr gerne in Südamerika arbeiten. Sie hat sich in Peru, Bolivien und Paraguay jeweils am Goetheinstitut beworben. Sinem hat sich jetzt aber entschieden, eine Zusage aus Paraguay abzulehnen, da ihr das Land zu unsicher ist.

Sie erzählt einem Freund davon, der nochmals nachfragt.

Freund: Wann würdest du als Deutschlehrerin nach Südamerika gehen?

	true	*false*
	Sinem: Nur wenn ich eine Zusage aus Peru bekomme, werde ich nach Südamerika gehen.	Sinem: Nur wenn ich eine Zusage aus Peru oder Bolivien bekomme, werde ich nach Südamerika gehen.

Ist Sinems Antwort wahr? [Ja] [Nein]

Table 17 Original exhaustification filler with both *true* and *false* answer

Rachel ist großer Fan von ihrem Heimat-Fußballclub, der aktuell in der 2. Liga spielt. Sie geht aber nur selten zu Spielen, die sind ihr in der 2. Liga oft zu langweilig. Sollte ihr Club aber absteigen, würde sie sich solidarisch zeigen und zur Unterstützung eine Dauerkarte fürs Stadion kaufen. Rachel hofft, dass ihr Club irgendwann in die 1. Liga aufsteigt. Sie würde auch dann eine Dauerkarte kaufen, weil Spiele in der Bundesliga größer sind und die Stimmung im Stadion aufregender ist.

Ihre Freundin erkundigt sich bei Rachel.

Freundin: Wann kaufst du dir eine Dauerkarte?

	true	*false*
	Rachel: Nur wenn der Club aufsteigt, oder absteigt kaufe ich mir eine Dauerkarte.	Rachel: Nur wenn der Club aufsteigt, kaufe ich mir eine Dauerkarte.

Ist Rachels Antwort wahr? [Ja] [Nein]

Table 18 Original exhaustification filler with both *true* and *false* answer