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# The landscape of non-canonical ‘only’ in German

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**Abstract:** This paper is part of a series of experimental studies that try to empirically chart the landscape of non-canonical uses of the particle *nur* ‘only’ in German, aiming at a comprehensive picture of how those uses can affect the interpretation of utterances in different clausal environments. While previous studies have focused on modal particle uses of German ‘only’ in *wh*-questions and imperatives, the present paper focuses on a non-canonical use in adverbial contexts, which has not been studied experimentally before.

**Keywords:** adverbial clauses; focus particles; imperatives; judgment studies; modal particles; *wh*-questions

## 1 Introduction

The focus particle *nur* in (1) is the German equivalent of English *only*. Its function is to associate with a focused constituent (e.g., *ins Schwimmbad* ‘to the swimming pool’ in [1]) and to exclude alternatives to the focused constituent (see, e.g., Büring and Hartmann 2001; König 1991; for seminal work).

- (1) *Ich gehe heute nur ins Schwimmbad.*  
‘Today, I only go to the swimming pool.’

It is well known that German *nur* also has modal particle readings in *wh*-questions and imperatives (e.g., Thurmair 2013), which have recently been investigated experimentally (Dörre 2018; Dörre et al. 2018; Dörre and Trotzke 2019). In this paper, we would like to highlight another non-canonical use of German *nur* (that is, another use as a non-focus particle) that has not been investigated empirically so far. In the following two examples, *nur* appears in a temporal adverbial clause (2a) and in an adverbial clause of manner (2b):

- (2) a. [*Wenn ich nur kann,*] *gehe ich ins Schwimmbad.*  
‘Whenever I am able to, I go to the swimming pool.’  
b. *Tom ruft die Kinder, [so laut er nur kann.]*  
‘Tom is calling the kids as loudly as he possibly can.’

In neither of these examples does the interpretation of *nur* correspond to the canonical focus particle reading, as indicated by the English translations in (2a) and (2b). Rather, the two examples illustrate non-canonical uses of *nur*, for which we assume that they point to a maximum on a scale (e.g., scale of amount of time, according to which an action is performed in [2a]; scale of loudness in [2b]). This paper is the first to experimentally compare those uses in adverbial clauses to the canonical focus particle use of German *nur* and to particle-less sentences. In doing so, our general goal is to arrive at a more comprehensive picture of the landscape of non-canonical ‘only’ in German.

The paper is structured as follows. Sections 2–5 report on a series of experiments that tried to identify to what extent the use of *nur* in examples like (2) above can affect the meaning of utterances. In our exploration of non-canonical *nur*, we wanted to leave the door open for all sorts of potential meaning contributions, ranging from its role as a verbal modifier to a modifier of the illocutionary level of utterances.

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In particular, we compare the uses in (2) to the canonical use of *nur* as focus particle (Section 2), to several cases of scalar interpretations either involving or not involving non-canonical *nur* (Sections 3 and 4), and to modal particles that effect the illocutionary level of utterances (Section 5). Section 6 concludes by summarizing the experimental results and indicating where the non-canonical use in adverbial clauses fits in the broader landscape of non-canonical ‘only’ in German.

## 2 Experiment 1: non-canonical ‘only’ in temporal adverbial clauses

In Experiment 1, we focused on temporal adverbial clauses like (2a) above and wanted to know whether native speakers of German confirm our judgment that examples like (2a) are systematically associated with a reading of *nur* that does not involve the canonical focus particle interpretation in (1). We therefore compared examples like (2a) to cases without *nur*, to cases replacing *nur* with German ‘always’ (*immer*) – because this is the reading we hypothesized for (2a), due to the pointing to a maximum on a scale of amount of time – and to cases like (3), where *nur* appears in a temporal adverbial clause but nevertheless receives the canonical focus particle interpretation due to a different syntactic position:

- (3) **Nur** wenn ich kann, gehe ich ins Schwimmbad.  
 ‘Only if I am able to, I go to the swimming pool.’

We conducted a judgment experiment where participants had to rate the frequency with which the action expressed by the sentences containing *nur* is performed. We hypothesized that if the non-canonical use of *nur* in (2a) points to a maximum on a scale of amount of time, resembling the temporal interpretation of ‘always’, ratings should not differ from the sentences containing ‘always’. Furthermore, if canonical *nur* in (3) highlights the exclusion of times when an action can be performed, ratings should differ from the other conditions insofar as the performed action is judged as less frequent.

### 2.1 Methods

#### 2.1.1 Participants

Thirty-six native speakers of German participated in the experiment, which was sent as a web-based questionnaire to the participants. Participants were not compensated.

#### 2.1.2 Materials

We created 10 sentences of the form “wenn ich kann, mache ich x” (‘if I am able to, I do x’; see Appendix A in the supplementary materials). For each of the 10 sentences, we used four conditions (see Table 1). Condition PLAIN contained no particle; condition CAN-ONLY contained the canonical (i.e., focus particle) *nur*, as seen in (3); condition NONCAN-ONLY contained the non-canonical *nur*, as in (2a); condition ALWAYS contained the temporal

**Table 1:** Mean ratings for the experimental conditions of Experiment 1.

Condition	Example sentence	Rating
PLAIN	<i>Wenn ich kann, gehe ich ins Schwimmbad.</i>	4.1
CAN-ONLY	<b>Nur</b> wenn ich kann, gehe ich ins Schwimmbad.	3.0
NONCAN-ONLY	Wenn ich <b>nur</b> kann, gehe ich ins Schwimmbad.	3.9
ALWAYS	<b>Immer</b> wenn ich kann, gehe ich ins Schwimmbad.	4.1

adverb *immer*. Ten sentences similar to the test sentences were added as fillers. The 50 sentences were allocated to five lists by means of a Latin square design.

### 2.1.3 Procedure

The questionnaire was created with SoSci Survey (Leiner 2014) and made available to the participants via the survey website. The questionnaire started with a short introduction. Participants were instructed to rate for each sentence how often the action in question is performed by the speaker. For instance, after reading ‘Only if I am able to, I go to the swimming pool’, participants had to decide how often the speaker goes to the pool (instruction: *Bitte geben Sie an, wie oft die Person die entsprechende Tätigkeit ausführt*). The rating was based on a six-point Likert scale, with “1” referring to “very rarely” and “6” to “very often”. The performance of the experiment took about three to five min for each participant.

## 2.2 Results

The mean overall rating for the experimental sentences was 3.8 (SD 1.5), indicating that participants were rather vague regarding the temporal interpretation of the items. Nevertheless, there was no value of 1–6 that was not given, indicating that the sentences indeed vary in their temporal interpretations.

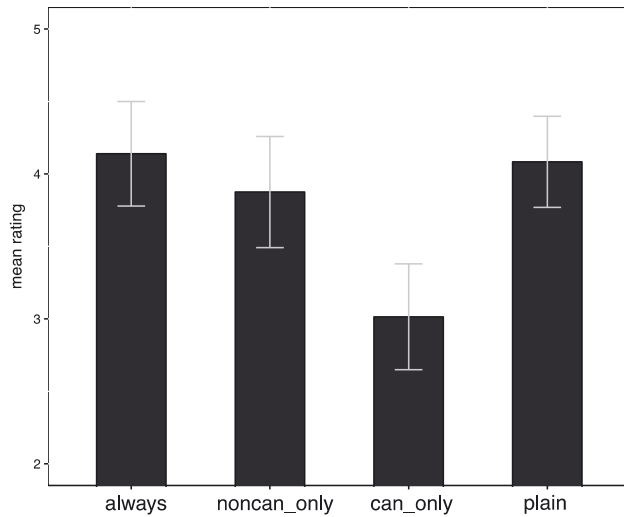
The ratings for the condition PLAIN and the condition ALWAYS were the highest (mean of 4.1), closely followed by the rating for the condition NONCAN-ONLY (3.9). The rating for the condition CAN-ONLY was the lowest (3.0). Table 1 depicts the mean ratings for the four experimental conditions.

In order to see whether the ratings for the conditions differ from each other, we analyzed them further by linear mixed models (R Core Team 2017, package *lme4*, Bates et al. 2015) with rating as the dependent variable, condition (PLAIN, CAN-ONLY, NONCAN-ONLY, ALWAYS) as the fixed factor, and participants and items as random effects. There was no significant difference between the conditions PLAIN and ALWAYS ( $t = -0.27$ , reference level = ALWAYS), between NONCAN-ONLY and ALWAYS ( $t = -0.85$ , reference level = ALWAYS), or between PLAIN and NONCAN-ONLY ( $t = -0.59$ , reference level = PLAIN), indicating that the sentences in all three conditions lead to the same temporal interpretation. However, and crucially, there was a significant difference between the conditions PLAIN and CAN-ONLY ( $\beta = -1.12$ ,  $SE = 0.22$ ,  $t = -4.99$ ,  $p < 0.001$ , reference level = PLAIN), between ALWAYS and CAN-ONLY ( $\beta = -1.18$ ,  $SE = 0.22$ ,  $t = -5.26$ ,  $p < 0.001$ , reference level = ALWAYS), and between NONCAN-ONLY and CAN-ONLY ( $\beta = -0.99$ ,  $SE = 0.23$ ,  $t = -4.36$ ,  $p < 0.001$ , reference level = NONCAN-ONLY). This indicates that the temporal interpretation of sentences containing canonical *nur* differs from the other three conditions insofar as the performance of the action expressed by the sentence containing canonical *nur* was rated as less frequent (see Figure 1).

## 2.3 Discussion

The judgment data for *nur* in temporal adverbial clauses showed that uses of *nur* similar to those in our key example (2a) above patterns with the readings of both *immer* (‘always’) and with the plain utterance containing no modification. In comparison to the interpretation of the canonical focus particle *nur*, the respective action  $x$  expressed by the temporal adverbial clauses is interpreted as taking place (more) often.

In sum, this experiment investigated the interpretation of non-canonical *nur* in temporal adverbial clauses and demonstrated that this use indeed differs from the interpretation of *nur* as a focus particle and instead patterns with German ‘always’. However, we also found that this non-canonical use of *nur* also patterns with the use of the same temporal adverbial clauses when they contain no *nur* at all. In the next experiment, we therefore tested whether this is also the case in an adverbial environment where we hypothesized to get clearer results for the difference between cases of non-canonical *nur* and cases without any *nur*: adverbial clauses of manner.



**Figure 1:** Ratings for the conditions; error bars represent a 95% confidence interval.

### 3 Experiment 2: non-canonical ‘only’ in adverbial clauses of manner

In Experiment 2, we investigated the meaning effect of non-canonical *nur* in another adverbial environment: adverbial clauses of manner. We hypothesized that this adverbial environment might feature a clearer distinction between “plain” utterances and utterances containing non-canonical *nur* because the relevant readings of non-canonical *nur* in Experiment 1 above were based on a temporal scale (i.e., the event is taking place “more often”), whereas adverbial clauses of manner in Experiment 2 introduce a scale based on intensity scales (e.g., Beltrama and Trotzke 2019). To this end, we conducted a judgment experiment with the particle *nur* embedded in relevant adverbial clauses (4) and with the plain clauses without the particle.

- (4) *Tom ruft die Kinder, so laut er **nur** kann.*  
 ‘Tom is calling the kids as loudly as he possibly can.’

#### 3.1 Methods

##### 3.1.1 Participants

Twenty-seven native speakers of German participated in the experiment, which was sent as a web-based questionnaire to the participants. Participants were not compensated.

##### 3.1.2 Materials

We created 10 sentences of the form “*Tom x-t, so y er nur kann*” (‘Tom is *x*-ing as *y* as he can’). In addition to the version containing the particle (ONLY), a further version was created without the particle (PLAIN), leading to sentence pairs with the two conditions ONLY and PLAIN (see Appendix B in the supplementary materials). As fillers, we added 20 sentence pairs from another experiment, similar to the experimental sentences. The 60 sentences were allocated to two lists by means of a Latin square design.

##### 3.1.3 Procedure

The questionnaire was created with SoSci Survey and started with a short introduction. Participants were instructed to rate for each sentence how *y* Tom is *x*-ing (e.g., how loudly Tom is calling). The rating was based

on a five-point Likert scale: “1” referred to a minimum on a scale (e.g., “very quietly”) describing the action (e.g., calling), and “5” to a maximum on a scale (e.g., “very loudly”) describing the same action. The performance of the experiment took about 5 min per participant.

### 3.2 Results

The data of three participants had to be excluded, since they did not have German as their (only) L1. The mean overall rating for the experimental sentences was 4.2 (SD 0.8). The ratings for the condition ONLY and the condition PLAIN were high (4.2) and did not differ. Table 2 depicts the mean ratings for the two conditions.

### 3.3 Discussion

As was the case in Experiment 1 (temporal adverbial clauses), we found no difference between using non-canonical *nur* and using no *nur* at all. One reason for this could be that the adverbial clauses contained actions that were combined with adjectives (corresponding to the English adverbs) in a way that means they already point to the maximum on the relevant scale (e.g., “loudly calling”, “quickly running”). Thus, our findings might be due to a ceiling effect: if the verb and the adjective already point to a maximum, non-canonical *nur* cannot yield a scalar reading of pointing to a maximum. We therefore conducted a third experiment, this time involving a set of combinations of verbs and adjectives that might help us remove this ceiling effect from our study.

## 4 Experiment 3: non-canonical ‘only’ in adverbial clauses of manner with scales controlled for

In Experiment 3, we chose adverbial clauses of manner that are inherently related to sound levels that point to different portions on a scale, with points ranging from maximum (MAX), as exemplified in (5), through medium (MED), in (6), to minimum (MIN), in (7).

- (5) *Tom spielt das Schlagzeug, so laut er **nur** kann.* (MAX)  
 ‘Tom is playing the drums as loudly as he possibly can.’
- (6) *Tom hustet, so laut er **nur** kann.* (MED)  
 ‘Tom is coughing as loudly as he possibly can.’
- (7) *Tom atmet, so laut er **nur** kann.* (MIN)  
 ‘Tom is breathing as loudly as he possibly can.’

**Table 2:** Mean ratings for experimental conditions of Experiment 2.

Condition	Example sentence	Rating
ONLY	<i>Tom ruft die Kinder, so laut er <b>nur</b> kann.</i>	4.2
PLAIN	<i>Tom ruft die Kinder, so laut er kann.</i>	4.2

If non-canonical *nur* in those clauses points to a maximum on a scale, we hypothesize that there will be differences between the clauses containing non-canonical *nur* and the same clause containing no particle, but only in the conditions MED or MIN. Due to a ceiling effect, we do not expect to find differences when the condition is MAX (see Experiment 2 above).

## 4.1 Methods

### 4.1.1 Participants

Thirty-one native speakers of German participated in the experiment, which was sent as a web-based questionnaire to the participants. Participants were not compensated.

### 4.1.2 Materials

We created 10 sentences of the form “*Tom x-t, so y er nur kann*” (‘Tom is *x*-ing as *y* as he can’) that involved an action inherently related to a maximal sound level. We created 10 further sentences of the same form that involved an action inherently related to a medium sound level, and 10 further sentences of the same form that involved an action inherently related to a minimal sound level. In addition to the 30 sentences containing the particle (ONLY), thirty sentences were created without the particle (PLAIN; see Appendix C in the supplementary materials). The 30 sentence pairs were allocated to two lists by means of a Latin square design. Each list was further divided in two lists: each participant saw the condition MED, either combined with the condition MAX or with the condition MIN, leading to four lists.

### 4.1.3 Procedure

The questionnaire was created with SoSci Survey. The questionnaire started with a short introduction. Participants were instructed to rate for each sentence how *y* Tom is *x*-ing (e.g., how loudly Tom is playing drums). The rating was based on a decibel scale ranging from 0 to 140. Participants had to type their response in an open text box. The performance of the experiment took about five to 7 min for each participant.

## 4.2 Results

The mean overall rating for the experimental sentences was 71.1 (SD 37.8). The ratings for the three conditions (MAX, MED, MIN) differed, with MAX showing the highest mean ratings (94.6), followed by MED (78.7), followed by MIN (30.2). These overall means indicate that the sentences of the three conditions inherently differed in their sound levels, with points ranging from high on a scale to low on a scale.

The ratings for the conditions MAX-ONLY and MAX-PLAIN were 94.8 versus 94.5, for the conditions MED-ONLY and MED-PLAIN they were 78.1 versus 79.3, and for the conditions MIN-ONLY and MIN-PLAIN they were 30.0 versus 30.4 (see Table 3). Linear mixed models (R Core Team 2017; package *lme4*, Bates et al. 2015) with rating as the dependent variable, sound level (MAX, MED, MIN) and particle (ONLY, PLAIN) as fixed factors, and participants and items as random effects show a significant difference between the conditions MAX and MED ( $\beta = -15.98$ ,  $SE = 8.12$ ,  $t = -1.967$ ,  $p = 0.0542$ , reference level = MAX), between MAX and MIN ( $\beta = -63.64$ ,  $SE = 8.47$ ,  $t = -7.52$ ,  $p < 0.001$ , reference level = MAX), and between MIN and MED ( $\beta = -47.66$ ,  $SE = 8.15$ ,  $t = -5.85$ ,  $p < 0.001$ , reference level = MED). There is neither a difference between the conditions ONLY and PLAIN, nor is there a significant interaction between the factors sound level and particle.

**Table 3:** Mean ratings for experimental conditions of Experiment 3.

Sound level	Particle	Example sentence	Rating
MAX	ONLY	<i>Tom spielt das Schlagzeug, so laut er <b>nur</b> kann.</i>	94.8
	PLAIN	<i>Tom spielt das Schlagzeug, so laut er kann.</i>	94.5
MED	ONLY	<i>Tom hustet, so laut er <b>nur</b> kann.</i>	78.1
	PLAIN	<i>Tom hustet, so laut er kann.</i>	79.3
MIN	ONLY	<i>Tom atmet, so laut er <b>nur</b> kann.</i>	30.0
	PLAIN	<i>Tom atmet, so laut er kann.</i>	30.4

### 4.3 Discussion

We again found no differences between the two conditions ONLY and PLAIN in adverbial clauses of manner, similar to our results from Experiment 2 above. We therefore conclude that non-canonical *nur* is semantically not visible in adverbial environments. However, to exclude the possibility that this non-canonical use of *nur* has no interpretive effect at all (and hence is a “dummy” element), we conducted a final experiment that tested for meaning effects of non-canonical *nur* not at the level of the proposition (like in Experiments 1–3), but rather at the level of illocutionary force.

## 5 Experiment 4: non-canonical ‘only’ and illocutionary effects

In Experiment 4, we again investigated the interpretation of non-canonical *nur* in adverbial clauses of manner, but this time comparing non-canonical *nur*, as in (8), not only to the same clauses without the particle as in (9), but also contrasting the use of non-canonical *nur* with the German modal particle *halt* ‘just/simply’, as in (10). The modal particle *halt* operates at the illocutionary level and signals that the speaker is “downtoning” the relevance of the proposition in a way that is plausible for the hearer (see Autenrieth 2015 for a detailed study).

- (8) *Tom ruft die Kinder, so laut er **nur** kann.* (ONLY)  
 ‘He is calling the kids as loudly as he can.’
- (9) *Tom ruft die Kinder, so laut er kann.* (PLAIN)  
 ‘He is calling the kids as loudly as he can.’
- (10) *Tom ruft die Kinder, so laut er **halt** kann.* (JUST)  
 ‘He is calling the kids as loudly as he can.’

The reason for including a modal particle that can be used in these adverbial clauses and thus the main difference to Experiment 3 is that the question the participants had to answer did not target the propositional meaning dimension (how loudly is Tom calling the kids?), but the illocutionary meaning dimension (how dedicated is Tom according to the speaker’s perspective when Tom performs the action?).

We expect the ratings for the sentences containing the modal particle *halt* (JUST) to differ from those of the sentences without a particle (PLAIN). If non-canonical *nur* in these clauses targets the illocutionary meaning dimension, parallel to what we expect for the modal particle *halt*, ratings for the condition ONLY should differ from those for the condition PLAIN as well.

## 5.1 Methods

### 5.1.1 Participants

Thirty-eight native speakers of German participated in the experiment, which was sent as a web-based questionnaire to the participants. Participants were not compensated.

### 5.1.2 Materials

We created 12 sentences of the form “*Tom x-t, so y er nur kann*” (‘Tom is *x*-ing as *y* as he can’). We created 12 further sentences of the same form without the particle (PLAIN), and 12 further sentences of the same form with the modal particle *halt* (JUST), leading to 36 experimental sentences and 12 sentence triplets (see Appendix D in the supplementary materials). The 12 sentence triplets were allocated to three lists by means of a Latin square design.

### 5.1.3 Procedure

The questionnaire was created with SoSci Survey. The questionnaire started with a short introduction. Participants were instructed to rate for each sentence how important they think it is to Tom to achieve a specific goal that is related to the described action (e.g., “How important it is to Tom that the kids hear him” after presenting the sentence ‘Tom is calling the kids as loudly as he can’). The rating was based on a seven-point Likert scale, with “1” referring to “he doesn’t care”, and “7” referring to “it is very important to him”. The performance of the experiment took about 5 min per participant.

## 5.2 Results

The data of three participants had to be excluded, since they did not have German as their L1. The mean overall rating for the experimental sentences was 5.5 (SD 1.4). There was no value of 1–7 that was not given, indicating that the sentences varied in their interpretations. The ratings for the condition ONLY and the condition PLAIN were high (6.0 vs. 5.7). The rating for the condition JUST (i.e., the modal particle *halt*) was lower (4.9). Table 4 depicts the mean ratings for the three conditions.

Linear mixed models (R Core Team 2017; package lme4, Bates et al. 2015) with rating as the dependent variable, particle (ONLY, PLAIN, JUST) as the fixed factor, and participants and items as random effects show a significant difference between JUST and ONLY ( $\beta = 1.03$ , SE = 0.17,  $t = 6.2$ ,  $p < 0.001$ , reference level = JUST), and between JUST and PLAIN ( $\beta = 0.83$ , SE = 0.17,  $t = 5.0$ ,  $p < 0.001$ , reference level = JUST). The difference between PLAIN and ONLY was not significant ( $t = -1.23$ , reference level = ONLY).

**Table 4:** Mean ratings for experimental conditions of Experiment 4.

Condition	Example sentence	Rating
ONLY	<i>Tom ruft die Kinder, so laut er <b>nur</b> kann.</i>	6.0
PLAIN	<i>Tom ruft die Kinder, so laut er kann.</i>	5.7
JUST	<i>Tom ruft die Kinder, so laut er <b>halt</b> kann.</i>	4.9



### 5.3 Discussion

As expected, we found a difference between *PLAIN* and *JUST* in adverbial clauses of manner, meaning that the modal particle *halt* affects the interpretation of the utterance by targeting the illocutionary meaning dimension. However, we still did not find any difference between *PLAIN* and *ONLY* in adverbial clauses of manner, not even at the illocutionary level. We can therefore conclude that the non-canonical use of *nur* in adverbial clauses does not function like a modal particle. Given these findings, let us now turn to our general discussion.

## 6 General discussion

In this paper, we experimentally investigated a non-canonical use of German ‘only’ that has not been studied in detail before, namely its non-canonical use in adverbial clauses. We submit that an investigation into this use of German *nur* is necessary to arrive at a more comprehensive picture of the landscape of non-canonical ‘only’ in German. We already know that there are several non-canonical uses of *nur* in both *wh*-questions and imperatives (and also in optative sentences; see Grosz 2014), but the use explored in the present paper has not been empirically studied before.

Interestingly, our findings suggest that while the use of non-canonical *nur* in adverbial clauses differs from the canonical focus particle interpretation (Experiment 1), this use does not affect the meaning of utterances – neither at the propositional (Experiments 2 and 3) nor at the illocutionary level (Experiment 4). In other words, in contrast to our introspective intuition that non-canonical *nur* in adverbial clauses features a distinct meaning contribution, we could not confirm this native-speaker intuition by experimental methods.

This opens a path for several interesting theoretical hypotheses of why the element *nur* in these environments seems to be semantically “invisible” to our participants, and in this brief conclusion we cannot discuss all of them – also because testing those hypotheses would require additional experiments.

One theoretical hypothesis that we would like to mention nevertheless is that this use of non-canonical *nur* could in fact be a grammaticalized element. Note that other focus particles have also been argued to grammaticalize (e.g., Giannakidou and Yoon 2016). Non-canonical *nur* in adverbial clauses occurs in configurations where the clause itself can be associated with a strengthening meaning (e.g., ‘as loudly as he (possibly) can’ or ‘When(ever) I can, I go ...’) that is signaled by *nur* as well. But instead of further strengthening this meaning, *nur* becomes invisible and merely (grammatically) marks this strengthening context. This is a grammaticalization path that has also already been claimed for German modal particles: for instance, Bayer (2012) has argued that the German question particle *denn* (lit. ‘then’) does not modify the meaning of a question (by, e.g., yielding a stronger version of the relevant question), but rather *denn* has grammaticalized into an element that simply marks that the utterance is a question in the first place. In a similar vein, we could hypothesize that non-canonical *nur* does not modify or strengthen the meaning of the adverbial clause either, but is merely a marker for the strengthened context (just like *denn* is a question marker). Needless to say, and as mentioned above, this is but one way to make sense of the challenging data we found in our experiments, and we leave it to future research to join us in further investigating the whole landscape of non-canonical uses of German ‘only’.

## References

- Autenrieth, Tanja. 2015. *Heterosemie und Grammatikalisierung bei Modalpartikeln*. Berlin: Max Niemeyer.
- Bates, Douglas, Martin Mächler, Ben Bolker & Steve Walker. 2015. Fitting linear mixed-effects models using lme4. *Journal of Statistical Software* 67. 1–48.
- Bayer, Josef. 2012. From modal particle to interrogative marker: A study of German *denn*. In Laura Brugè, Anna Cardinaletti, Giuliana Giusti, Nicola Munaro & Cecilia Poletto (eds.), *Functional heads*, 13–28. Oxford: Oxford University Press.

- Beltrama, Andrea & Andreas Trotzke. 2019. Conveying emphasis for intensity: Lexical and syntactic strategies. *Language and Linguistics Compass* 13. 1–13.
- Büring, Daniel & Katharina Hartmann. 2001. The syntax and semantics of focus-sensitive particles in German. *Natural Language & Linguistic Theory* 19. 229–281.
- Dörre, Laura. 2018. *Primary and secondary meaning in the processing of German particles*. Konstanz: Universität Konstanz dissertation.
- Dörre, Laura, Anna Cypionka, Andreas Trotzke & Josef Bayer. 2018. The processing of German modal particles and their counterparts. *Linguistische Berichte* 255. 313–346.
- Dörre, Laura & Andreas Trotzke. 2019. The processing of secondary meaning: An experimental comparison of focus and modal particles in *wh*-questions. In Daniel Gutzmann & Katharina Turgay (eds.), *Secondary content: The semantics and pragmatics of side issues*, 143–167. Leiden: Brill.
- Giannakidou, Anastasia & Suwon Yoon. 2016. Scalar marking without scalar meaning: Nonscalar, nonexhaustive even-marked NPIs in Greek and Korean. *Language* 92. 522–556.
- Grosz, Patrick Georg. 2014. Optative markers as communicative cues. *Natural Language Semantics* 22. 89–115.
- König, Ekkehard. 1991. *The meaning of focus particles: A comparative perspective*. London: Routledge.
- Leiner, Dominik J. 2014. SoSci Survey, version 2.6.00-i. Available at: <https://www.soscisurvey.de/en/index>.
- R Core Team. 2017. *R: A language and environment for statistical computing*. Vienna: R Foundation for Statistical Computing. Available at: <https://www.R-project.org/>.
- Thurmair, Maria. 2013. Satztyp und Modalpartikeln. In Jörg Meibauer, Markus Steinbach & Hans Altmann (eds.), *Satztypen des Deutschen*, 627–651. Berlin: De Gruyter.

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