The Rhetorical Potential of Metaphor
An experimental study on the effect of metaphors in argumentation

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Metaphors are deemed to have rhetorical potential. In what way and to what extent they affect argumentation is, however, not entirely clear. How exactly does metaphor presence influence argument evaluation? To answer this question, an experiment was conducted in which respondents had to evaluate dialogue fragments in which novel, direct metaphors were used to present a premise of the argumentation. The results show that metaphor presence negatively affects the reasonableness evaluation of argumentation

KEYWORDS: argumentation, experiment, metaphors, reasonableness evaluation.

1. INTRODUCTION

Metaphors are said to possess rhetorical potential; through the comparison of a source and target domain, a metaphor could make a message more convincing. Various reasons for this supposed rhetorical potential have been given: metaphors provide relief or pleasure, enhance a speaker's *ethos*, reduce counter-arguing, increase cognitive elaboration, induce associations in semantic memory and improve comprehension (see Charteris-Black, 2011; Oswald & Rihs, 2014; Van Stee et al., 2018; Thibodeau, Hendricks & Boroditsky, 2017).

Sopory & Dillard (2006, pp. 408-409) show in their meta-analysis that the presence of a metaphor in persuasive messages positively affects a receiver's attitude. The researchers nevertheless advocate caution when drawing conclusions about the rhetorical potential of metaphors: the messages in their meta-analysis were highly fine-tuned and, even for these finely-tuned messages, almost 40% decreased – as opposed to increased – persuasiveness. Sopory & Dillard (2006, p. 413) suggest that familiarity with the metaphor's target domain, the metaphor's novelty and its extendedness positively impact

its effectiveness, but also call for future researchers to "investigate other variables that have the potential to moderate the effectiveness of metaphorical messages".

From the field of argumentation theory, at least one variable that impacts the persuasiveness of argumentation is known: the soundness of the argumentation (see O'Keefe, 2005; Meuffels, 2006). As O'Keefe (2005, p. 220) puts it: "normatively-good argumentative practices commonly engender persuasive success". In the literature on metaphor's rhetorical potential, the soundness of the argumentation put forward in the tested messages has so far not been given due consideration. In this contribution, the results of an experimental study on the use of metaphor in normatively good ("sound") argumentation and argumentation that can be regarded as normatively bad ("fallacious") will therefore be discussed. To what extent does the presence of a metaphor affect the evaluation of sound and fallacious argumentation?

Before delving into this study, first the research question will be refined by specifying the type of metaphor on which the study focuses (section 2). Subsequently, the organisation of the experiment will be outlined (section 3) and the results obtained in it will be presented (section 4). Lastly, the implications of these results will be discussed (section 5).

2. METAPHORS AND ARGUMENTATION

Metaphors can vary in novelty. Novel metaphors are those metaphors in which that which is meant about the target domain has not been (commonly) said before in terms of that which is said about the source domain. To understand novel metaphors therefore requires mapping of the source domain onto the target domain (Lakoff & Johnsen, 2003, p. 53). This is for example required when, in his speech at the annual *Conservative Political Action Conference*, US President Trump (2018) described immigrants in terms of a snake that, despite being cared for by a tender-hearted woman, bites this woman. Through his rather uncommon description, Trump encouraged the audience to connect the reference to the snake and its bad behaviour towards the woman (the source domain of animal care) to immigrants and the consequences of their admission to the US (the target domain of immigration).

In contrast to novel metaphors, conventional metaphors are used to such an extent that it is in principle not necessary anymore to map the source domain onto the target domain – in other words, these metaphors need not be processed as metaphors. Examples of conventional metaphors include expressions such as "*running* out of time" or "the *core* of the problem", which are perfectly understandable

even without thinking of a certain type of physical activity or the centre of a particular kind of fruit. Indeed, Bowdle & Gentner (2005) stipulate in their Career of Metaphor theory that conventional metaphors are processed by means of categorisation; the metaphor's meaning is already in place in the recipient's mind and simply has to be retrieved. To encourage subjects to process metaphors as metaphors, or in Steen's (see 2008; 2010; 2017) terminology as "deliberate metaphors", the present study strived to focus on metaphors that were as novel as possible.

Additionally, the present study focused on direct metaphors. To explain why, it is helpful first to take a look at indirect metaphors. For indirect metaphors, there is a contrast between the contextual and basic meaning of the lexical unit (i.e., word or word combinations) used to express the metaphor (Steen, 2010, p. 54). The contextual meaning is the lexical unit's meaning when taking into account the co-text and situation in which it is used, while the basic meaning refers to the more concrete, precise, bodily action-related and/or older sense of the lexical unit (Pragglejaz Group 2007, p. 3). For example, when talking about "the war on cancer", the contextual meaning of "war" is "a determined and organized effort to control or stop something" (in this case cancer), while its basic meaning concerns "fighting between two or more countries that involves the use of armed forces and usually continues for a long time" (Macmillan Dictionary, 2018).

For direct metaphors, such a contrast between contextual and basic meaning of the lexical unit is not present. In fact, the contextual meaning of a direct metaphor is the same as its basic meaning. Such a metaphor is nevertheless still distinct from non-metaphorical language because it presents a contrast in meaning of the metaphor-related words (i.e., the words used to express the metaphor) at the level of the text or topic (Steen, 2010, p. 55). For example, in the utterance "The patient wasn't hooked to the drip feed!" that is used to explain why a phone is not charged, the words "patient", "hooked" and "drip feed" do not require any cross-domain mapping at the level of the lexical unit, as they activate the medical concepts directly referred to in the text. However, a new referent is introduced that is incongruous with the context: that of phone charging. Thus, understanding these metaphor-related words in the context of phone charging requires cross-domain mapping at the level of the topic.

In the present study, only direct metaphors are used. The reason for this is that direct metaphors enable the expression of an entire premise of the argumentation metaphorically, which has the advantage that we know with certainty that processing of the metaphor as a metaphor is essential for understanding and subsequently evaluating the argument.

3. ORGANISATION OF THE STUDY

3.1 Set-up

Based on the considerations presented in the previous section, the research question central to the present study can be refined as: to what extent does the presence of a (maximally) *novel, direct* metaphor affect the evaluation of sound and fallacious argumentation *in which this metaphor is used to convey a premise in the argumentation*?

To answer this question, a questionnaire was constructed in which respondents had to rate the perceived reasonableness of a discussion party's contribution to short dialogue fragments of informal discussions. This contribution consisted either of a pragma-dialectically sound argument, or an argument that could be considered as fallacious from a pragma-dialectical perspective (cf. Van Eemeren, Garssen & Meuffels, 2009). Furthermore, the premise in these sound or fallacious arguments was either expressed non-metaphorically or presented by means of a (maximally) novel, direct metaphor. This way, the effect of the presence of the metaphor on the perceived reasonableness of the argumentation could be contrasted with the controls consisting of literally expressed arguments.

In line with Sopory & Dillard's (2006, p. 413) suggestion to investigate variables that could moderate metaphors' rhetorical effects, respondents were asked to evaluate the comprehensibility and naturalness of the discussion contributions in addition to evaluating their reasonableness. The reason for this is that understanding metaphors (as reflected in their perceived comprehensibility) has been positively linked to metaphor appreciation, and the aptness of metaphors (as reflected in their perceived naturalness) is positively linked to metaphor comprehensibility (see Chiappe, Kennedy & Chiappe, 2003; Trick & Katz, 1986). It is therefore expected that the perceived comprehensibility and naturalness of metaphors might also affect the perceived reasonableness of their use in argumentation.

3.2 Materials

The experimental study combined a multiple-message design with a repeated-measures design: the questionnaire consisted of 36 short dialogue fragments, by means of which multiple instantiations of sound and fallacious arguments with and without metaphors were tested. In half of the items, the presented argument was pragma-dialectically sound (the other half being fallacious), and in one out of three items, the premise in the argument was conveyed by means of a (maximally)

novel, direct metaphor. Since the study aims to establish the effect of metaphor on the reasonableness evaluation of argumentation in general, different types of argumentation were systematically varied (i.e., pragmatic, causal and symptomatic argumentation). An overview of the item distribution can be found in Table 1.

It should be noted that the experiment combined a between and within subjects design. A between subjects design was used with respect to metaphor presence; respondents did not see the same items with and without metaphor. A within subjects design was used with respect to soundness of the argumentation; respondents saw several items with both sound and fallacious arguments.

	TYPE OF ARGUMENTATION	**WITH METAPHOR**	**WITHOUT METAPHOR**	**TOTAL**
SOUND	PRAGMATIC	2	2	
	CAUSAL	2	2	**12**
	SYMPTOMATIC	2	2	
FALLACIOUS	SLIPPERY SLOPE	2	2	
	INCORRECT CAUSAL RELATION	2	2	**12**
	HASTY GENERALISATION	2	2	
EXTRA CONTROLS	SOUND		6	
	AD HOMINEM (DIRECT)		3	**12**
	AD HOMINEM (*TU QUOQUE*)		3	
TOTAL		**12**	**24**	**36**

Table 1 – Distribution of the items in the questionnaire. The items "with metaphor" included a novel direct metaphor to present a premise in the argumentation. The items "without metaphor" did not include any metaphorical language.

The items themselves followed a fixed pattern (see Figure 1). At the start of each dialogue fragment, a brief description was provided of the discussion topic and the relationship between speakers A and B. To make sure that respondents evaluated the quality of B's argumentation, a variety of discussion topics that are as uncontroversial as possible was included (e.g., coffee, work habits and exercising). Additionally, to

ensure that respondents regarded the dialogues as informal discussions, it was made clear that speakers A and B know each other (e.g., they are colleagues, family members or friends) and that the discussions were not conducted in specific institutionalised contexts.

Subsequent to the item's background information, a two-turn dialogue followed: speaker A puts forward a standpoint in turn 1 and speaker B contradicts A's standpoint and provides a sound or fallacious argument for his or her own standpoint in turn 2. If a metaphor is included in B's argumentation, the metaphor is (maximally) novel and direct. In half of all the items with metaphors, the metaphor was signalled as a metaphor by means of an indicator of analogy (e.g., "similarly", " "it's just like", "equally").

(*i*) *Background information on the topic of the discussion and the relationship between speakers A and B*

A Puts forward a standpoint.

B Contradicts A's standpoint and provides a sound or fallacious argument for his or her own standpoint, in which the premise is presented by means of a (maximally) novel, direct metaphor or without a metaphor.

(*ii*) *Two friends are discussing work.*

A People should always try to stay in their job, no matter whether they like it or not.

B I disagree; tigers in small cages will get ill as well.

(*iii*) *Two friends are discussing work.*

A People should always try to stay in their job, no matter whether they like it or not.

B I disagree; employees who stay in a job in which they aren't appreciated will get unhappy.

Figure 1 – A (i) schematic representation of the dialogue fragments in the questionnaire, a (ii) concrete example of such a fragment with sound pragmatic argumentation and metaphor, and the (iii) non-metaphorical counterpart of example (ii).

Each item was directly followed by the question "How comprehensible do you find B's contribution to the conversation?", which was in turn followed by similarly formulated questions about reasonableness and naturalness. Each of the questions had to be answered on a 7-point Likert scale, ranging from "very incomprehensible / unreasonable / unnatural" (= 1) to "very comprehensible / reasonable / natural" (= 7).

Thereby, the reasonableness scale corresponded with the scale used in Van Eemeren, Garssen & Meuffels (2009), and the comprehensibility and naturalness scales allowed for comparison between the scales.

To make the sound and fallacious argumentation in the questionnaire as comparable as possible, they each use the same argument schemes (i.e., pragmatic, causal and symptomatic argumentation, see Table 1). In the fallacious arguments, there is however an incorrect application of this argument scheme: the slippery slope fallacy can be regarded as an incorrect application of the negative variant of pragmatic argumentation, the fallacy of incorrect causal relation is, as the name suggests, an incorrect application of causal argumentation, and the fallacy of hasty generalisation amounts to an incorrect application of symptomatic argumentation (Van Eemeren & Grootendorst, 1992; 2004). Extra controls were included in the questionnaire by way of adding additional sound arguments as well as direct *ad hominem* fallacies and *tu quoque* fallacies (see Table 1).

The dialogue fragments underwent several rounds of revision before they were deemed suitable for inclusion in the study. Two colleagues at the University of Amsterdam (a metaphor researcher and an argumentation theorist) helped evaluating whether speaker B *contributes to the discussion in the dialogue fragments in the intended way* (by using a deliberate metaphor in the envisioned types of argumentation). Two native speakers of English checked the *correctness* and *naturalness* of the formulation used in the dialogues, as well as the *overall uniformity* of the dialogue fragments (does the conversation in the dialogues proceed in an identical manner?) and their *stylistic variety* (do the speakers use various kinds of formulations?). Attention was also paid to the *length of the dialogues*: the dialogues were kept as concise as possible to ensure that filling out the questionnaire would not take too much time (can the dialogue not be kept shorter?).

Before filling out the questionnaire, respondents received some information about the study. To refrain from giving away the purpose of the study, the terms "metaphor" and "argumentation" were carefully avoided. Instead, respondents were told "Depending on the specific topic and context of a conversation, people might have different ideas about the comprehensibility, reasonableness and naturalness of particular contributions to the conversation; what one might find perfectly fine, others might not. The purpose of this research is to determine which conditions influence people's ideas about conversational contributions".

It was furthermore emphasised that respondents may assume that the speakers in the questionnaire's dialogue fragments always speak the truth, that these speakers are completely different people in each of the different dialogue fragments, that no special expertise is

required for filling out the questionnaire and that there are no right or wrong answers. Subsequently, it was stressed that respondents could stop participation at any moment or withdraw their data up to 8 days after completion, and that their data was processed anonymously. They were then provided with the contact details of the author and of the *Ethics Committee Faculty of Humanities* of the *Amsterdam Institute for Humanities Research*, and asked for their consent.[1]

3.2 Respondents

A total of 408 native speakers of English were randomly selected via online research platform *Prolific Academic*. Only native speakers were asked to participate to minimise the influence of language proficiency problems. Other than that, no specific requirements were laid down for participation. *Prolific Academic* was used for practical reasons: since the study was designed in the Netherlands and needed be conducted in English, distributing the questionnaire via this online research platform allowed for obtaining sufficient responses from native English speakers. In compliance with *Prolific Academic*'s policy, respondents were rewarded £1.50 for their participation.

Respondents were between18 and 73 years old, with an average age of 33.9 (SD = 11.4). Somewhat more respondents were female (63.2%); 36.3% were male and 0.5% non-binary. A slight majority of the respondents was higher educated (54.3% was higher educated versus 45.6% lower educated).[2] It took the respondents between 15 and 20 minutes to complete the questionnaire. It should be noted that respondents were given maximally 45 minutes to complete the questionnaire in *Prolific Academic* to avoid responses that were, for some reason, interrupted. Any responses that were timed out or incomplete for other reasons were excluded from the analyses.

4. RESULTS

Now that organisation of the study has been outlined, we can take a look at the results. First, the effect of the presence of novel, direct metaphors on argumentation on the perceived reasonableness scores of sound and fallacious arguments will be determined. Second, possible relations

[1] Approval for the experiment was provided by the *Ethics Committee Faculty of Humanities* on 6 July 2018 (dossier 2018 -52).

[2] Respondents were considered to be 'higher educated' if their highest completed level of education consisted of a university Bachelor's degree, a university Master's degree, or a PhD or equivalent. They were considered to be 'lower educated' if their highest completed educational level was elementary school, high school or vocational school or equivalent.

between the comprehensibility and naturalness scores on the one hand, and the reasonableness scores on the other hand, will be checked.

4.1 The effect of metaphor presence

Before determining the effect of metaphor presence and argumentative soundness on reasonableness evaluation, we should first take a look at the reasonableness evaluations of the control items, as they provide the benchmarks against which the results can be interpreted.

Table 2 shows that the respondents gave the sound control items (in which no metaphors were used) on average a score of 5.44 (SD = 1.45), meaning that they regarded these arguments to be between "fairly reasonable" and "reasonable". As expected, this is not significantly different from the reasonableness scores of the sound items of interest without metaphor (which obtained an average score of 5.59, SD = 1.53) as presented in Table 3a. It should also be noted that these scores are similar to the average reasonableness scores that Van Eemeren, Garssen & Meuffels (2009) report in their research[3], which indicates the robustness of these findings.

	REASONABLENESS SCORE WITHOUT METAPHOR
SOUND	5.44 (1.45)
FALLACIOUS (*AD HOMINEM*, DIRECT)	4.00 (1.70)
FALLACIOUS (*AD HOMINEM*, *TU QUOQUE*)	5.37 (1.54)

Table 2 – Mean reasonableness scores of the sound and fallacious control items without metaphorical language (scale values are means with SD between parentheses)

Since the scores for the controls provide us with the means to interpret the other reasonableness scores, we can now take a look at the main results of interests. As Table 3a shows, the mean reasonableness scores of the items in which a premise in the argumentation is presented by means of a metaphor is structurally lower for both the sound and fallacious items than these scores are for items in which the premise is presented directly, without the use of a metaphor. Table 3b indicates

[3] Van Eemeren, Garssen & Meuffels (2009), for example, report mean scores of 5.27 (SD = 0.60) and 5.32 (SD = 0.60) for the sound items in their research on the *argumentum ad consequentiam*, and a score of 5.31 (SD = 0.66) in their research on the slippery slope fallacy.

that this structurally lower score is independent of the type of argumentation used.

	REASONABLENESS SCORE WITH METAPHOR	**REASONABLENESS SCORE WITHOUT METAPHOR**
SOUND	3.58 (1.89)	5.59 (1.53)
FALLACIOUS	2.96 (1.67)	4.46 (1.71)

Table 3a – Mean reasonableness scores of the sound and fallacious items of interest with and without novel, direct metaphors as premises (scale values are means with SD between parentheses)

	TYPE OF ARGUMENTATION	**REASONABLENESS SCORE WITH METAPHOR**	**REASONABLENESS SCORE WITH METAPHOR**
SOUND	PRAGMATIC	4.69 (1.94)	5.59 (1.61)
	CAUSAL	3.52 (1.87)	5.88 (1.24)
	SYMPTOMATIC	3.52 (1.83)	5.30 (1.66)
FALLACIOUS	SLIPPERY SLOPE	2.60 (1.55)	4.15 (1.76)
	INCORRECT CAUSAL RELATION	3.53 (1.71)	4.77 (1.61)
	HASTY GENERALISATION	2.76 (1.57)	4.44 (1.68)

Table 3b – Mean reasonableness scores of the sound and fallacious items of interest with and without novel, direct metaphors as premises specified for each argument type (scale values are means with SD between parentheses)

To determine whether the difference in the reasonableness scores of arguments with and without metaphor in Table 3a is significant, a mixed model analysis was conducted. Overall, there seems to be a significant effect of metaphor presence ($F(1, 9374) = 2440.48$; $p < .001$): respondents evaluated sound and fallacious argumentation combined to be significantly more reasonable if it did not include any metaphorical language (on average, they evaluated this argumentation with a score of 5.02 (SD = 1.72)) than if a novel, direct metaphor was used to present a premise in this argumentation (which they gave an average score of 3.27 (SD = 1.80)) .

When taking the soundness of the argumentation into account, there is, as expected, a significant difference between the reasonableness evaluation of the sound and the fallacious

argumentation, irrespective of metaphor presence (F (1, 9374) = 1490.28; $p < .001$): when the combined group of sound arguments with and without metaphors are contrasted with the combined group of fallacious arguments with and without metaphors, the sound arguments were evaluated as significantly more reasonable (on average with a score of 4.58 (SD = 1.99)) than the fallacious ones (which received an average score of 3.71 (SD = 1.84)).

Interestingly, the analysis shows that there is also a significant interaction between soundness and metaphor presence (F (1, 9374) = 111.71; $p < .001$), meaning that metaphor presence obscures the effect that the soundness of the argumentation has on perceived reasonableness. In other words, even though respondents find fallacious argumentation less reasonable than sound argumentation in argumentation with and without metaphors, the extent to which they find fallacious argumentation less reasonable is smaller when a novel, direct metaphor is used in the argumentation than when no metaphors are used at all.

It was additionally checked whether these results hold equally for the different types of argumentation (i.e., for the argument schemes of pragmatic, causal and symptomatic argumentation, see *table 3b*). Rather unexpectedly, they did not (F (2, 6098) = 110.75; $p < .001$). There seems to be a significant interaction between argument type, metaphor presence and soundness (F (2, 6337) = 3.51; $p = .03$). A pairwise comparison of means shows that only for causal and pragmatic sound argumentation there are no significant differences in reasonableness evaluation, meaning that the interaction is predominantly due to differences in evaluation of the fallacious counterparts of these schemes. Apart from argument type, no other extraneous variables seem to have impacted the study.

4.2 The effect of comprehensibility and naturalness

In addition to reasonableness, respondents were also asked to evaluate the comprehensibility and naturalness of the dialogue fragments. The idea behind this is that, especially when respondents had to evaluate the reasonableness of arguments in which a premise is presented by means of a novel, direct metaphor, the more comprehensible and natural they find this argument, the more reasonable they would find it.[4]

Table 4a shows that there is indeed a significant positive correlation between the overall comprehensibility, reasonableness and

[4] For this reason, only the items that respondents saw with metaphors were included in the correlation analysis; the extra sound controls and the *ad hominem*-fallacies were left out of the equation.

naturalness scores of the argumentation in the items of interest: the more comprehensible the argumentation was to the respondents, the more reasonable and natural they found it, and the more natural they judged the argumentation to be, the more reasonable and comprehensible they found it as well. A partial correlation in which metaphor presence is regarded as a covariate (see Table 4b) shows that these correlations are, in fact, independent of metaphor presence. Thus, comprehensibility and naturalness of the argumentation itself already seems to be a factor in the reasonableness evaluation of argumentation, irrespective of the use of metaphors in this argumentation.

	1	**2**	**3**
1. COMPREHENSIBILITY	-		
2. REASONABLENESS	.68**	-	
3. NATURALNESS	.72**	.78**	-

Table 4a – Pearson correlations among comprehensibility, reasonableness and naturalness scores. ** Correlation is significant at the 0.01 level (2-tailed).

	1	**2**	**3**
1. COMPREHENSIBILITY	-		
2. REASONABLENESS	.61**	-	
3. NATURALNESS	.66**	.73**	-

Table 4b – Partial correlations among comprehensibility, reasonableness and naturalness scores with metaphor presence as a covariate. ** Correlation is significant at the 0.01 level (2-tailed).

5. CONCLUSION

So, to what extent does the presence of a novel, direct metaphor affect the evaluation of sound and fallacious argumentation in which this metaphor is used to convey a premise in the argumentation? This study indicates that the presence of such a metaphor affects the reasonableness evaluation of sound and fallacious argumentation, but not in the positive way that was suggested in the extant literature on metaphors in general: rather, the presence of a novel, direct metaphor

that is used as a premise in an argument negatively impacts the reasonableness evaluation of both sound and fallacious argumentation. What is more, our analysis shows that the extent to which this negative impact arises depends on an interaction between soundness and metaphor presence: a fallacious argument is less affected by metaphor presence than a sound argument

This finding seems to go against the idea that metaphors might reduce counter-arguing or improve comprehension, as mentioned in the argumentation literature. It also challenges the idea that metaphor presence, in general, positively affects reasonableness evaluation, which can be formed based on studies in the field of communication, and the acclaimed positive correlation between reasonableness and effectiveness in empirical research in the field of argumentation. Although the results might therefore be regarded as surprising, it might not be so surprising after all. As mentioned in the introduction of this paper, meta-analyses on the persuasiveness of metaphor already showed that the effects of metaphor presence on argumentative discourse are varied: sometimes metaphor presence yields a more positive evaluation, sometimes a more negative one. This could be due to the a lack of controlling the soundness of the argumentation, the novelty of the metaphors, and the metaphor's argumentative use, as well as failing to take into account the comprehensibility and naturalness of metaphors. Indeed, this was the reason why this study only focussed on a particular type of metaphor with a particular kind of argumentative use in the present study: novel, direct metaphors that were used to express a premise in the argumentation. It was also the reason why respondents were asked how comprehensible and natural they found the metaphorically expressed argumentation. This study now seems to have found one of the reasons why the meta-analyses gave such mixed results: neither the particular use and type of metaphor was typically taken into account, nor its overall perception in the discourse itself.

While this does explain why we obtained different results from those in previous research, it does not explain the interaction that was found in the present study between soundness and metaphor presence. We found that the negative impact that metaphor presence has on the reasonableness evaluation of sound argumentation was greater than on this evaluation of fallacious argumentation. This could perhaps be explained by the idea that metaphors increase cognitive elaboration and therefore leave less room to critically evaluate the message that they convey, which has been put forward in the literature. Yet, whether this is indeed the case should be explored in more detail in future research.

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