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Does Macbeth See a Dagger? An Empirical Argument for the Existence-Neutrality of Seeing

Abstract

In a recent paper, Justin D'Ambrosio (2020) has offered an empirical argument in support of a negative solution to the puzzle of Macbeth's dagger—namely, the question of whether, in the famous scene from Shakespeare's play, Macbeth *sees* a dagger in front of him. D'Ambrosio's strategy consists in showing that “seeing” is not an existence-neutral verb; that is, that the way it is used in ordinary language is *not* neutral with respect to whether its complement exists. In this paper, we offer an empirical argument in favor of an existence-neutral reading of “seeing”. In particular, we argue that existence-neutral readings are readily available to language users. We thus call into question D'Ambrosio's argument for the claim that Macbeth does not see a dagger. According to our positive solution, Macbeth *sees* a dagger, even though there is not a dagger in front of him.

1. Introduction

In a recent paper, Justin D'Ambrosio (2020) offers an empirical argument in support of a negative solution to the puzzle of Macbeth's dagger—namely, the question of whether, in the famous scene from Shakespeare's play, Macbeth *sees* a dagger in front of him. D'Ambrosio's strategy consists in showing that “seeing” is not an existence-neutral verb; that is, that the way it is used in ordinary language is *not* neutral with respect to whether its complement exists. This allows for an account of ascriptions of seeing that are likewise *not* existence-neutral: to say that ‘S sees O’, it is required that O exists. Thus, it follows that Macbeth *does not* see a dagger, for it is not true that there is a dagger that he sees.

In this paper, we offer an empirical argument in favor of an existence-neutral reading of “seeing”. In particular, we argue that existence-neutral readings of “seeing” are readily available to language users. We thus call into question D'Ambrosio's argument for the claim that Macbeth does not see a dagger. That is, if our argument is on the right track, it allows for an account of ascriptions of seeing that are existence-neutral. On this view, to say that ‘S sees

O', it is *not* required that O exists. Based on this, we further argue that a positive answer to the puzzle of Macbeth's dagger is available: Macbeth *sees* a dagger, even though there is not a dagger in front of him.

The paper is divided into three parts. The first part is dedicated to discussing and criticizing D'Ambrosio's argument against the existence-neutrality of seeing (Section 2). The second and third parts are dedicated to developing our own argument, which can be further divided into a *negative* and a *positive* argument. First, we provide an empirical argument for the existence-neutrality of seeing (Section 3). This is our negative argument. Second, we show how this argument supports a positive answer to the puzzle of Macbeth's dagger (Section 4). This is our positive argument. While related to one another in important ways, we shall argue that the former can be accepted even if the latter is denied.

2. D'Ambrosio's Argument Against the Existence-Neutrality of Seeing

D'Ambrosio's (2020) overall strategy in solving the puzzle of Macbeth's dagger consists in appealing to more general discussions about the nature of Intensional Transitive Verbs (ITVs). According to him, a verb is an ITV if it involves a verb phrase exhibiting at least one of the following three features:

- (1) there is a reading of the verb that fails to entail that its complement exists;
- (2) substituting the complement of the verb for a coreferential expression changes its truth-value; and
- (3) there is a reading of the verb that fails to entail a 'specific' reading of it.

To use one of D'Ambrosio's example, the verb phrase "looking for" exhibits all the three features in question, and as such, constitutes a paradigmatic occurrence of an ITV. To illustrate, consider (1) first. That 'John is looking for Santa Claus' does not require that Santa Claus exists. So, 'looking for' allows for a reading where its complement does not exist. Consider (2) now. That 'Martin is looking for Emmanuel Macron' does not entail that 'Martin is looking for the President of France'. Substituting the complement of 'looking for' for a coreferential expression thus changes its truth-value. Finally, consider (3). That 'Andrew is looking for an English teacher' does not entail that 'Andrew is looking for a *particular* English teacher'. Thus, there is a reading of 'looking for' that fails to entail a 'specific' reading of it.

With a characterization of ITVs in place, D’Ambrosio proceeds by considering whether different perceptual verbs, such as “seeing”, “touching”, “perceiving”, and “sensing”, behave more or less like ITVs. Since, more specifically, the argument supporting the negative answer to the puzzle of Macbeth’s dagger turns on whether “seeing” behaves like an ITV, we will focus on it here. In particular, as D’Ambrosio (2020, p. 8) himself makes it explicit, the basic issue concerning the puzzle of Macbeth’s dagger is whether (1) is true of “seeing”—in other words, whether “seeing” is *existence-neutral* with regard to its complement. If that turns out to be the case, then a positive answer to the puzzle suggests itself: Macbeth *does see* a dagger. Otherwise, we are left with a negative answer: Macbeth *does not see* a dagger.

Arguments against the existence-neutrality of “seeing” have been offered elsewhere in the literature.¹ What makes D’Ambrosio’s argument distinctive is, as he points out, its *empirical* character. Rather than relying on intuitions about different readings of “seeing” in ordinary language, D’Ambrosio presents a set of studies that are meant to establish that “seeing” is used in a non-existential-neutral way by language users.²

In the studies in question (Studies 1, 2, and 3 in D’Ambrosio 2020), participants are first asked to assume that a certain kind of entity—e.g., elves, dragons, purple pandas, extra-terrestrials—does not exist and are then asked to answer a number of questions about what they take to be possible in such situations. For example, in Study 1, the target question about seeing reads:

Suppose that there are no elves. We want to know: is it possible for John to see an elf?

Studies 2 and 3 differ from Study 1 in that additional information is provided to participants. In Study 2, with the goal of ruling out worries pertaining to the fact that some participants may believe that elves and other mystical creatures exist, participants were also asked to suppose that any occasional reports of people encountering such creatures are “in fact just due to people’s vivid imaginations” (2020, p. 13). In Study 3, information about the goals of the study was explicitly provided to participants.

In all three studies, responses were collected on a 7-point Likert scale, with an answer 1 indicating “definitely not” and 7 indicating “definitely yes”. D’Ambrosio writes:

¹ See, e.g., Moore (1905), Ayer (1940), Anscombe (1965), Brogaard (2014, 2015), Bourget (2017).

² D’Ambrosio also looks at whether “seeing” exhibits features (2) and (3) discussed above. As he notes, however, (1) is central to motivate his solution to the puzzle of Macbeth’s dagger. Since our focus is on this solution, we will focus solely on (1), or existence-neutrality.

If a participant responded with a high number, it indicated that the participant took there to be a possible situation in which the premise of the [existence-neutrality] inference [i.e., ‘X sees Y’] is true and its conclusion [i.e., ‘Y exists’] is false, which is just to say that the participant took the verb to exhibit [existence-neutrality]. (2020, p. 10)

In two of the three studies, participants’ mean responses were low (Study 1: $M = 1.94$; Study 3: $M = 2.92$) while in the remaining one (Study 2: $M = 4.41$) the mean was slightly above the middle of the scale (no information is given as to whether this difference from the middle of the scale was statistically significant).

As noted above, in addition to “seeing”, Studies 1 to 3 also collected data related to other perceptual verbs, such as “sensing” and “perceiving”, and compared the responses to the questions involving these verbs to the ones involving “seeing”. The rationale for doing so is, as D’Ambrosio makes explicit, to compare the associated responses with participants’ responses to paradigmatically intensional and extensional verbs. For instance, in Study 1, responses for “seeing”, “sensing”, and “perceiving” were compared with responses for “searching for” (a paradigmatically intensional verb) and “touching” (a paradigmatically extensional verb). The results, consistent in all three studies focusing on existence-neutrality, suggest that while some perceptual verbs, such as “seeing”, behave more like extensional verbs, other perceptual verbs, such as “perceiving”, behave more like intensional verbs. Thus, insofar as existence-neutrality is concerned, D’Ambrosio argues that “seeing” does not behave like ITVs. D’Ambrosio found that his participants were in general reluctant to agree that it is possible to see entities that do not exist.

These results finally allow D’Ambrosio to propose a negative solution to the puzzle of Macbeth’s dagger. Since “seeing” behaves like paradigmatically extensional verbs when it comes to existence-neutrality, it follows that an ascription of seeing cannot be made when the complement of a perceptual verb does not exist. Moreover, since in Macbeth’s case, it is not the case that the complement of the perceptual verb exists—i.e., the dagger does not exist—Macbeth’s case does not qualify as a case of seeing. In what follows, we resist this conclusion by showing that existence-neutral readings of seeing are readily available to language users. In particular, we provide an empirical argument to the effect that, insofar as Macbeth’s case is concerned, an existence-neutral reading of “seeing” is preferred by language users.

3. An Empirical Argument for the Existence-Neutrality of Seeing

Attempts to show that “seeing” is existence-neutral have been based on intuitions and theoretical considerations about the nature of perceptual states.³ To the best of our knowledge, no empirical argument for the existence-neutrality of “seeing” has been provided in the literature so far. We thus propose to develop such an argument here. More generally, we present a set of ten studies that establish that readings of “seeing” that are existence-neutral are readily available to language users. More specifically, three of these studies demonstrate that, when asked directly about Macbeth’s case, an existence-neutral reading of “seeing” is the preferred alternative to describe the case. In the positive argument developed in Section 4 we conclude from this that, insofar as existence-neutrality is concerned, it follows that Macbeth sees a dagger.

3.1. The Existence-Neutrality of “Seeing”

As a first step towards providing a positive solution to the puzzle of Macbeth’s dagger, we present six studies showing that existence-neutral readings of “seeing” are readily available to language users. As a second step, we discuss, in Section 3.2, the relationship between “seeing” and other existence-neutral verbs, such as “hallucinating”, “dreaming”, and “imagining”, and look at their relationship to ascriptions of belief and truth.

3.1.1. Study 1. Hallucinated tiger. Likert scale

This study tested whether participants are willing to make ascriptions of seeing in a scenario described with a perceptual existence-neutral verb (i.e., “hallucinate”).

Participants. All studies reported in this paper were online studies with paid study participants recruited on Prolific.ac. All participants were US or UK nationals who indicated English as their first language. Sample characteristics for individual studies are presented in Table 1.

Study	N	M_{age} (SD); age range	% female/male/non-binary
Study 1	50	36.3 (12.7); 18-64	60%/40%/0%
Study 2	30	32.6 (11.6); 21-60	63%/37%/0%
Study 3	60	35.3 (12.4); 19-67	63%/37%/0%
Study 4	52	35.5 (13.8); 18-67	71%/27%/2%
Study 5	30	33.8 (12.8); 20-62	70%/30%/0%

³ See, e.g., Moore (1905), Ayer (1940), Anscombe (1965), Brogaard (2014, 2015), Bourget (2017).

Study 6	32	36.3 (14.8); 18-70	59%/38%/3%
Study 7	230	35.6 (11.4); 18-68	62%/38%/0%
Study 8	239	35.2 (13.0); 18-75	50%/48%/2%
Study 9	160	34.3 (12.7); 18-69	53%/46%/1%
Study 10	30	39.4 (14.2); 18-69	53%/47%/0%

Table 1. Sample characteristics for studies reported in this paper.

Materials. Participants in Study 1 were provided with the following story:

Suppose John is lying awake on a bed in an otherwise empty room. John vividly hallucinates a tiger attacking him.

After reading the story, they were asked to indicate to what extent they agree or disagree with the following two descriptions of the situation (displayed in random order) on the scale from 1 to 7, where 1 means ‘Completely disagree’ and 7 means ‘Completely agree’:

‘There is a tiger in John’s room.’

‘John sees a tiger.’

Results. One-sample t-tests against the middle of the scale (4) showed that participants strongly disagreed that there is a tiger in John’s room ($M = 1.60$, $SD = 1.40$, $t(49) = 12.2$, $p < .001$, $d = 1.71$) while strongly agreeing that John sees a tiger ($M = 6.06$, $SD = 1.50$, $t(49) = 9.69$, $p < .001$, $d = 1.37$). Focusing only on participants who completely disagreed that there is a tiger in John’s room (choosing 1 on the scale, $n = 37$), they still strongly agree that John sees a tiger ($M = 6.14$, $SD = 1.55$, $t(36) = 8.39$, $p < .001$, $d = 1.38$). See Figure 1(a).

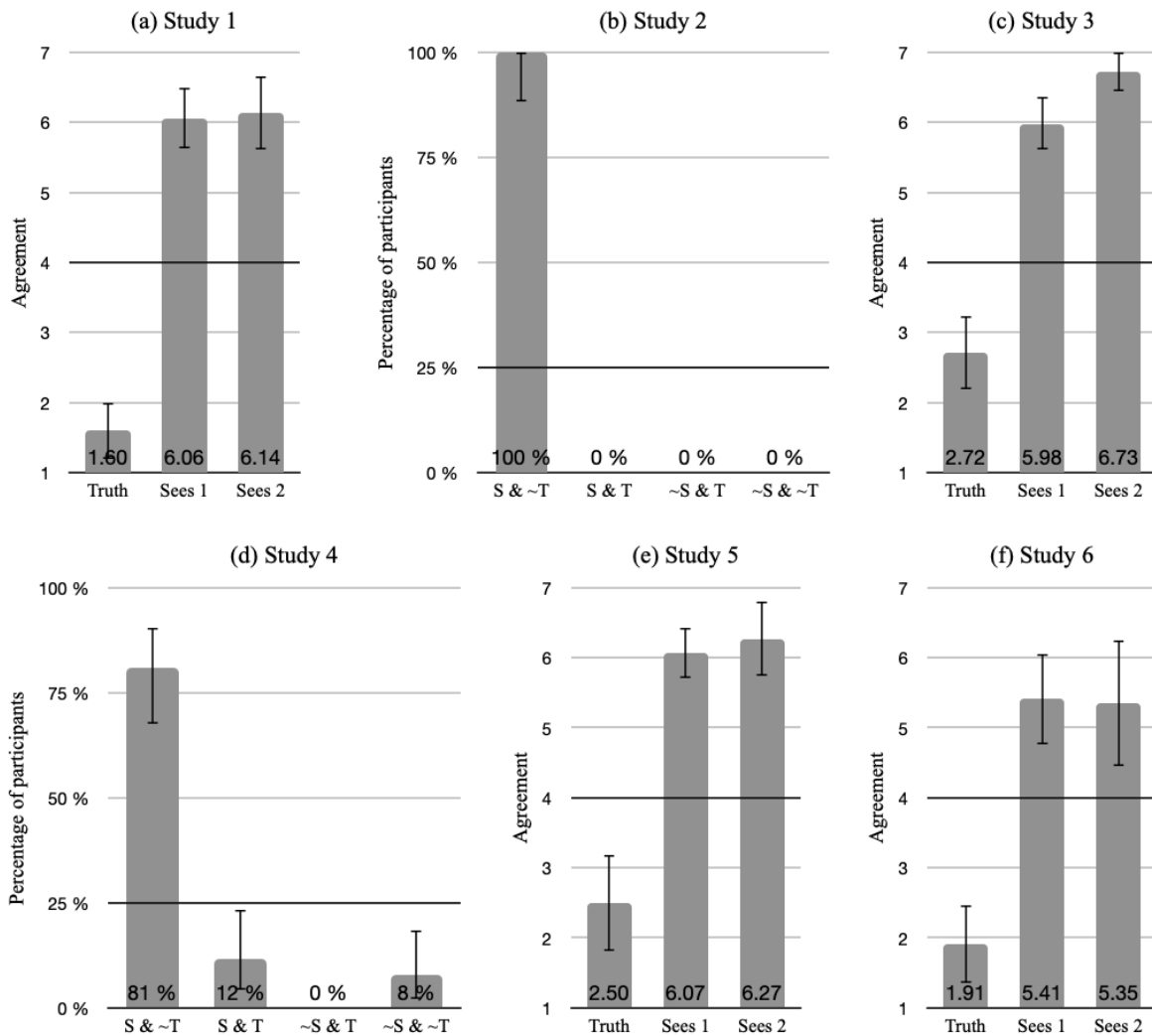


Figure 1. Results of Studies 1-6. S – Sees; T – True; 1 – full sample; 2 – only those who completely deny that there’s a tiger in the room / dagger in front of Macbeth (by choosing 1 on the scale). Reference lines indicate the middle of the scale (4) in (a), (c), (e), and (f), and proportion of responses that can be expected to obtain by chance alone (25%) in (b) and (d). Error bars indicate 95% CI.

Discussion. “Hallucinate” is clearly an existence-neutral verb. The fact that participants are willing to describe John as “seeing”, even when it is stated explicitly that he is hallucinating, shows that an existence-neutral reading of “seeing” is readily available to them.

3.1.2. Study 2. Hallucinated tiger. Categorical scale

This study tested whether results of Study 1 can be replicated with a different type of task.

Materials. Participants were provided with the same story as in Study 1 but instead of the Likert scales they were given four descriptions of the situation (in randomized order) and were asked to indicate which of them is most suitable to describe this situation:

John sees a tiger but there is no tiger in his room.

John sees a tiger and there is a tiger in his room.

John does not see a tiger but there is a tiger in his room.

John does not see a tiger and there is no tiger in his room.

Results. All thirty participants (100%) chose the description ‘John sees a tiger but there is no tiger in his room.’ A binomial test indicated that this was significantly more often than would be expected by chance alone (which would be 25%), $p < .001$. See Figure 1(b).

Discussion. Study 2 relies on a different methodology, but obtains similar results to Study 1, thus supporting the idea that an existence-neutral reading of “seeing” is readily available to participants to describe the Tiger case.

3.1.3. Study 3. Macbeth’s dagger. Likert scale

This study used the same methodology used in Study 1 to test whether participants are willing to make ascriptions of seeing when given a direct description of Macbeth’s case.

Materials. Participants were randomly assigned to one of two conditions. They were provided with the following description of Macbeth’s story taken from D’Ambrosio’s paper (2020, p. 3) (participants in ‘long’ condition received full story and participants in ‘short’ condition were given only the part in the brackets):

[Consider the scene from Shakespeare’s famous play in which Macbeth, feverish with prospective guilt, hallucinates a dagger], and asks himself, in the grip of this hallucination, “Is this a dagger which I see before me / The handle toward my hand?”

After reading the story, they were asked to indicate to what extent they agree or disagree with the following two descriptions of the situation (displayed in random order) on the scale from 1 to 7, where 1 means ‘Completely disagree’ and 7 means ‘Completely agree’:

‘There is a dagger in front of Macbeth.’

‘Macbeth sees a dagger.’

Results. One-sample t-tests against the middle of the scale (4) showed that participants disagreed that there is a dagger in front of Macbeth ($M = 2.72$, $SD = 2.03$, $t(59) = 4.91$, $p < .001$, $d = .63$) while agreeing that Macbeth sees a dagger ($M = 5.98$, $SD = 1.44$, $t(59) =$

10.64, $p < .001$, $d = 1.37$). Focusing only on participants who completely disagreed that there is a dagger in front of Macbeth (choosing 1 on the scale, $n = 26$), they still strongly agree that Macbeth sees a dagger ($M = 6.73$, $SD = .72$, $t(36) = 19.2$, $p < .001$, $d = 3.77$). See Figure 1(c).

Since there was a difference in ascriptions of truth (but not seeing) between conditions—participants who received the long version were more willing to agree that there is a dagger in front of Macbeth ($M_{\text{long}} = 3.31$, $SD_{\text{long}} = 2.35$; $M_{\text{short}} = 2.16$, $SD_{\text{short}} = 1.51$; $t(58) = 2.27$, $p = .027$ —we provide separate analyses for each condition.

Long ($n = 29$). One-sample t-tests against the middle of the scale (4) showed that participants' responses did not differ from the midline for the truth question ($M = 3.31$, $SD = 2.35$, $t(28) = 1.58$, $p = .125$, $d = .29$) while agreeing that Macbeth sees a dagger ($M = 6.24$, $SD = 1.30$, $t(28) = 9.29$, $p < .001$, $d = 1.72$). Focusing only on participants who completely disagreed that there is a dagger in front of Macbeth (choosing 1 on the scale, $n = 9$), they strongly agree that Macbeth sees a dagger ($M = 6.89$, $SD = .33$, $t(8) = 26.0$, $p < .001$, $d = 8.67$).

Short ($n = 31$). One-sample t-tests against the middle of the scale (4) showed that participants disagreed that there is a dagger in front of Macbeth ($M = 2.16$, $SD = 1.55$, $t(30) = 6.79$, $p < .001$, $d = 1.22$) while agreeing that Macbeth sees a dagger ($M = 5.74$, $SD = 1.55$, $t(30) = 6.26$, $p < .001$, $d = 1.12$). Focusing only on participants who completely disagreed that there is a dagger in front of Macbeth (choosing 1 on the scale, $n = 9$), they still strongly agree that Macbeth sees a dagger ($M = 6.65$, $SD = .86$, $t(16) = 12.7$, $p < .001$, $d = 3.07$).

Discussion. Study 3 uses the same methodology as Study 1, but now asking participants to evaluate Macbeth's case. The results show that, despite "hallucinating" being an existence-neutral verb, and despite the prompt clearly stating that Macbeth is hallucinating, participants are still prone to use "seeing" in an existence-neutral way to describe the case. This provides further support to the idea that an existence-neutral reading of "seeing" is readily available to language users. Crucially, the study also shows that an existence-neutral reading of "seeing" is readily available to language users to describe Macbeth's case in particular.

3.1.4. Study 4. Macbeth's dagger. Categorical scale

This study used the same methodology as the one used in Study 2 to test whether participants are willing to make ascriptions of seeing when given a direct description of Macbeth's case.

Materials. Participants were provided with the same story as in Study 3 (2 between-subjects conditions: long and short) but instead of two Likert scales they were given four descriptions of the situation (in randomized order) and were asked to indicate which of them is most suitable to describe this situation:

Macbeth sees a dagger but there is no dagger in front of him.

Macbeth sees a dagger and there is a dagger in front of him.

Macbeth does not see a dagger but there is a dagger in front of him.

Macbeth does not see a dagger and there is no dagger in front of him.

Results. No differences were observed between the conditions ($X^2(2, N = 52) = .65, p = .724$) so participants were pooled for further analysis. Forty-two participants (81%; 95% CI = [68%; 90%]) chose the description ‘Macbeth sees a dagger but there is no dagger in front of him.’ A binomial test indicated that this was significantly more often than would be expected by chance alone (which would be 25%), $p < .001$. The other three options were selected less frequently than could be expected by chance (all $ps < .03$). Six participants (12%) chose ‘Macbeth sees a dagger and there is a dagger in front of him.’ The remaining four participants (8%) chose ‘Macbeth does not see a dagger and there is no dagger in front of him.’ See Figure 1(d).

Discussion. Study 4 relies on a different methodology, but obtains similar results to Study 3, thus supporting the idea that an existence-neutral reading of “seeing” is readily available to participants to describe Macbeth’s case. One possibility at this point is that, if participants knew about the goals of the experiment—i.e., that we want to know whether “seeing” is existence-neutral—they would be inclined to use “seeing” in a non-existential-neutral way. We consider this scenario in Study 5.

3.1.5. Study 5. Macbeth’s dagger. Explicit task

This study tested whether participants are willing to make ascriptions of seeing when given a direct description of Macbeth’s case even after an explanation of the goals of the study.

Materials. Participants were provided with the following instruction (adapted from D’Ambrosio’s 2020, Study 3):

This study concerns the meanings of certain verbs in English.

Some verbs can only relate people to things that exist. Others do not have this restriction.

Consider two examples:

Since unicorns don't exist, it is not possible for John to 'ride' a unicorn, but it is possible for him to 'want' a unicorn. We are trying to determine whether a specific collection of verbs behaves more like 'ride' or more like 'want'.

In this study, we want to know whether 'see' behaves more like 'ride' or more like 'want'.

Consider the scene from Shakespeare's famous play in which Macbeth, feverish with prospective guilt, hallucinates a dagger.

After reading the story, they were asked whether they agree with the following two claims, as in Study 3:

'There is a dagger in front of Macbeth.'

'Macbeth sees a dagger.'

Results. One-sample t-tests against the middle of the scale (4) showed that participants disagreed that there is a dagger in front of Macbeth ($M = 2.50$, $SD = 1.83$, $t(29) = 2.18$, $p < .001$, $d = .82$) while agreeing that Macbeth sees a dagger ($M = 6.07$, $SD = .94$, $t(29) = 1.71$, $p < .001$, $d = 2.19$). Focusing only on participants who completely disagreed that there is a dagger in front of Macbeth (choosing 1 on the scale, $n = 11$), they still strongly agree that Macbeth sees a dagger ($M = 6.27$, $SD = .79$, $t(10) = 9.59$, $p < .001$, $d = 2.89$). See Figure 1(e).

Discussion. In line with the previous results, even when participants are told the goals of the study, they are still prone to use "seeing" in an existential-neutral way to describe Macbeth's case. This dismisses the possibility discussed above, according to which making the goals of the study explicit in the prompt would alter the way participants use "seeing".

A more general objection to the studies discussed so far is that the entities described are *existing* entities (i.e., tiger, dagger), so these are objects that *could have been seen* in those situations. This would explain why participants are willing to use "seeing" in an existence-neutral way in those cases. If, however, they were asked about entities that do not exist—such as elves—"seeing" would be used in an existential-neutral way. We address this objection in Study 6.

3.1.6. Study 6. Evil elf

This study tested whether participants are willing to make ascriptions of seeing in a scenario described with a perceptual existence-neutral verb (i.e., “hallucinate”) whose object is a non-existent entity.

Materials. Participants were provided with the following story:

Suppose John is lying awake on a bed in an otherwise empty room. John vividly hallucinates an elf attacking him.

After reading the story, they were asked to indicate to what extent they agree or disagree with the following two descriptions of the situation (displayed in random order) on the scale from 1 to 7, where 1 means ‘Completely disagree’ and 7 means ‘Completely agree’:

‘There is an elf in John’s room.’

‘John sees an elf.’

Results. One-sample t-tests against the middle of the scale (4) showed that participants disagreed that there is an elf in John’s room ($M = 1.91$, $SD = 1.53$, $t(31) = 7.73$, $p < .001$, $d = 1.37$) while agreeing that John sees an elf ($M = 5.41$, $SD = 1.78$, $t(31) = 4.48$, $p < .001$, $d = .79$). Focusing only at participants who completely disagreed that there is an elf in John’s room (choosing 1 on the scale, $n = 20$), they still agree that John sees an elf ($M = 5.35$, $SD = 1.90$, $t(19) = 3.18$, $p = .005$, $d = .71$). See Figure 1(f).

Discussion. This study addresses the more general worry raised above. It shows that, even when the complements of “seeing” are non-existent entities, participants are still willing to use “seeing” in an existence-neutral way to describe the relevant situations.

Here, it may be argued that the prompt does not rule out the possibility that elves exist. It may be that participants believe that they exist, and as such, believe that elves can be seen. This objection is correct—our results do not rule out this possibility. This is a crucial difference between our setup and D’Ambrosio’s. D’Ambrosio explicitly asks participants to make modal assumptions about the nature of the entities in question. However, we believe that this is problematic for the reasons that we discuss in Section 4.

3.2. Seeing, Dreaming, Hallucinating, and Imagining

So far, we have focused on investigating whether existence-neutral readings of “seeing” are readily available to language users. In our descriptions of the relevant cases in Studies 1 to 6,

we relied on a verb that is clearly existence-neutral, namely, “hallucinating”, and asked whether the relevant situations count as cases of seeing. In this section, we present studies where the relevant situations were described by using other existence-neutral verbs, more specifically, “dreaming” and “imagining”. In addition, we look at the relationship between ascriptions of seeing, hallucinating, dreaming, and imagining and ascriptions of belief and truth.

3.2.1. Study 7. Dreams, Hallucinations, and Imagination (1)

This study provided participants with different scenarios described by using other existence-neutral verbs to test (1) whether they are willing to make ascriptions of seeing in those scenarios and (2) whether they are willing to make ascriptions of belief and truth.

Materials. Participants were assigned to one of three conditions and had to read a short story:

[Hallucinating] Suppose John is lying awake on a bed in an otherwise empty room. John **hallucinates** a tiger attacking him.

[Dreaming] Suppose John is lying asleep on a bed in an otherwise empty room. John **dreams** a tiger attacking him.

[Imagining] Suppose John is lying awake on a bed in an otherwise empty room. John **imagines** a tiger attacking him.

After reading the story, participants were asked to evaluate seven claims (in randomized order) on the scale from 1 to 7, where 1 means ‘Completely disagree’ and 7 means ‘Completely agree’:

[Truth] John is being attacked by a tiger.

[Sees] John sees a tiger attacking him.

[Does not see] John does not see a tiger attacking him.

[Thinks] John thinks that he is being attacked by a tiger.

[Does not think] John does not think that he is being attacked by a tiger.

[Believes] John believes that he is being attacked by a tiger.

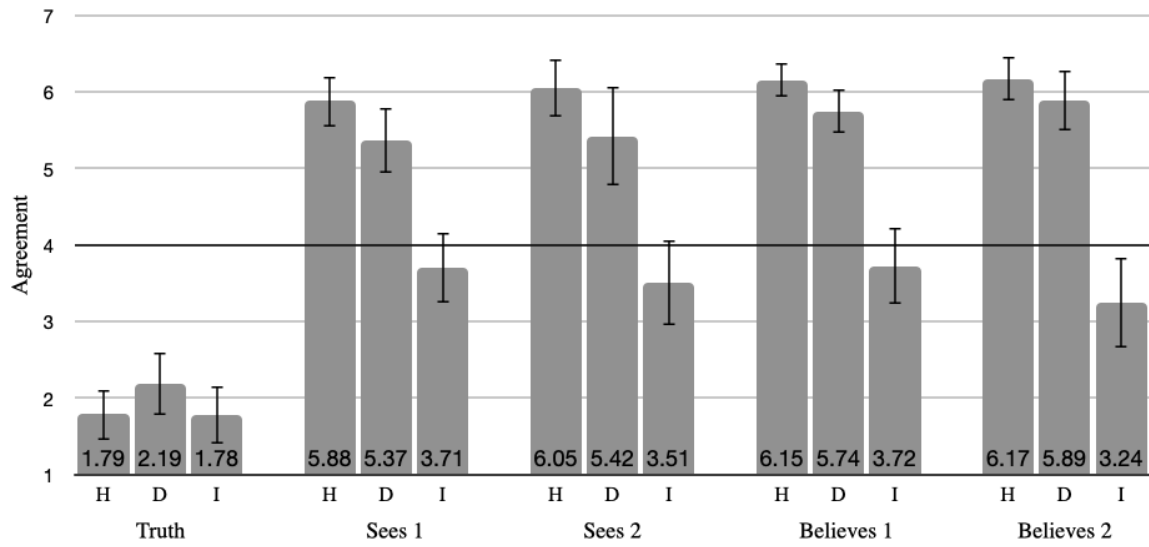
[Does not believe] John does not believe that he is being attacked by a tiger.

Results. A composite score for seeing was calculated by averaging both items (after inverting the negative one; Cronbach’s alpha was .88). A composite score for believing was

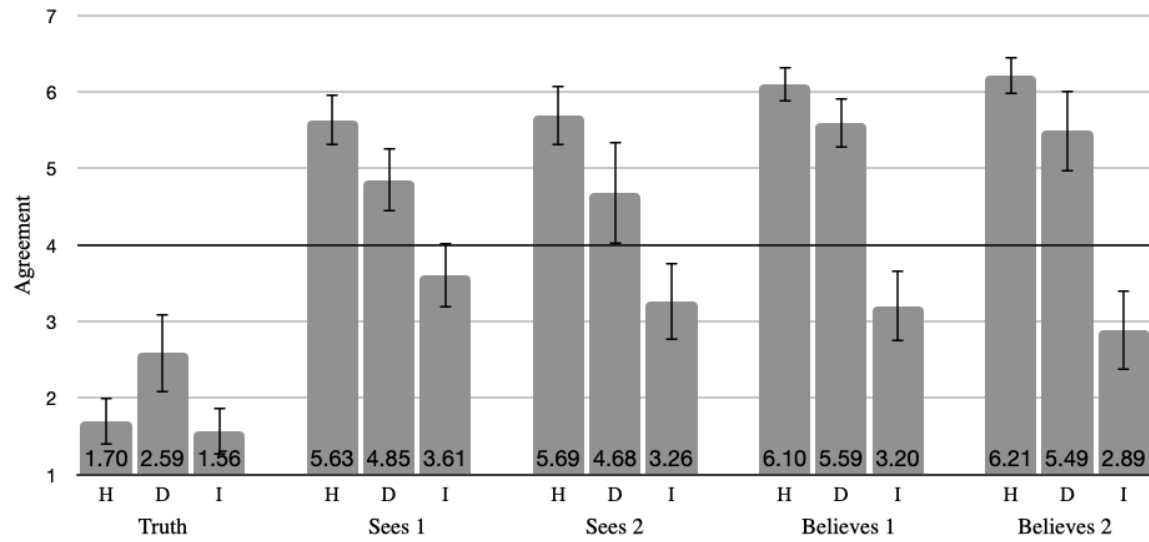
calculated by averaging the four scores (Cronbach's alpha was .92) for thinking and believing (after inverting the scales with the negative formulations).

Study results are presented in Figure 2(a). One-sample t-tests against the middle of the scale (4) showed that participants in all three conditions clearly disagreed that John is being attacked by a tiger (all $ps < .001$). However, participants in both the hallucination and dreaming conditions thought that John sees a tiger attacking him and also believes that he is being attacked by a tiger (both $ps < .001$). Scores for seeing and believing did not differ from the middle of the scale in the imagining condition ($ps \geq .20$).

(a) Study 7. 'Sees'



(b) Study 8. 'Sees that'



(c) Study 8. 'Feels like'

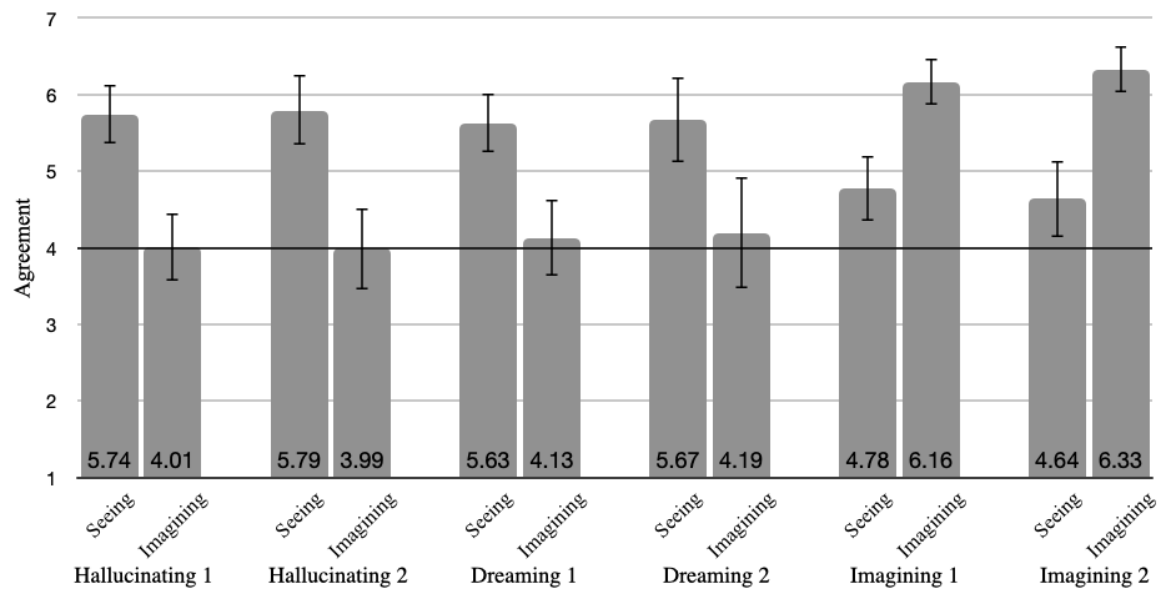


Figure 2. Results of Studies 7 and 8. H – Hallucinating; D – Dreaming; I – Imagining; 1 – full sample; 2 – only those who completely deny (1 on the scale) that there’s a tiger in the room. Reference lines indicate the middle of the scale (4). Error bars indicate 95% CI.

Pairwise t-tests indicated that participants in the imagination condition were less willing than those in either the hallucinating and dreaming conditions to agree that that John sees a tiger attacking him or believes that he is being attacked by a tiger (all $ps < .001$). No differences were observed between hallucinating and dreaming in ascriptions of seeing ($p = .057$), but participants in the hallucinating condition were slightly more willing to ascribe belief than in the dreaming condition ($p = .023$).⁴

Discussion. This study shows that, just like with “hallucinating”, participants are willing to use “seeing” in an existential-neutral way to describe dreaming (but not imagining) situations. Since, like “hallucinating”, “dreaming” is also existence-neutral, this provides yet another source of evidence for the claim that an existence-neutral reading of “seeing” is readily available to language users. The fact that this effect was not achieved with “imagining”—which is also an existence-neutral term—may suggest that people think that imagination has a different phenomenological profile than seeing, and, therefore, that they do not think that “seeing” applies to imagined episodes. We address this potential explanation in Study 8.

3.2.2. Study 8. Dreams, Hallucinations, and Imagination (2)

Study 8 is very similar to Study 7. The crucial difference between the studies is in wording of vignettes and “seeing” probes. While Study 7 uses wording “dreams/hallucinates/imagines/sees a tiger attacking him”, Study 8 uses a different construction: “dreams/hallucinates/imagines/sees that a tiger is attacking him”. Our aim is to see whether the result is robust to wording changes and whether the same pattern can be seen in ascriptions of “seeing that” as was observed in ascriptions of seeing simpliciter.

Materials. Materials were identical to those used in Study 7, with the following two changes. First, the proper name of the character was changed from John to Steve. Second, in both vignettes and questions, the phrase “[hallucinates/dreams/imagines/sees/does not see] a tiger attacking him” was changed to “[hallucinates/dreams/imagines/sees/does not see] that a

⁴ Focusing only on participants who completely disagreed that John is being attacked by a tiger (choosing 1 on the scale, $n = 151$, 66% of the whole sample), we see the same pattern of results. There are only two relatively minor divergences from the results that were observed in the full sample. First, while in the full sample participants in the imagination condition neither agreed nor disagreed that John believes that he is being attacked by a tiger ($p = .27$), after exclusions they slightly disagreed with this claim ($p = .013$). Second, while in the full sample participants in the hallucinating condition were slightly more willing to ascribe belief than in the dreaming condition ($p = .023$), this difference ceases to be statistically significant after exclusions ($p = .24$).

tiger is attacking him”. At the end of the study, participants were asked whether they agree with two additional claims about Steve’s phenomenology (in fixed order; on the scale from 1 to 7, where 1 means ‘Completely disagree’ and 7 means ‘Completely agree’):

To Steve, it feels like seeing that a tiger is attacking him.

To Steve, it feels like imagining that a tiger is attacking him.

Results. Study results are presented in Figure 2 (b and c).⁵ One-sample t-tests against the middle of the scale (4) showed that in all three conditions participants clearly disagreed that Steve is being attacked by a tiger (all $ps < .001$). However, participants in the hallucination and dreaming conditions thought that Steve sees a tiger attacking him (both $ps < .001$) and also believes that he is being attacked by a tiger (both $ps < .001$). Scores for seeing did not differ from the middle of the scale in the imagining condition ($p = .071$) while scores for belief were below the middle ($p < .001$).

Pairwise t-tests indicated that, as in Study 7, participants in the imagination condition were less willing than those in either the hallucinating and the dreaming conditions to agree that Steve sees a tiger attacking him or that he believes that he is being attacked by a tiger (all $ps < .001$). This time, however, differences of moderate size were observed between hallucinating and dreaming not only in ascriptions of seeing ($p = .003$) but also in ascriptions of belief ($p = .009$), with scores somewhat higher in the hallucinating condition.⁶

Looking at ascriptions of phenomenology (see Figure 2(c)) via a series of paired-samples t-tests, participants in the imagination condition were more inclined to say that it feels to Steve like imagining than like seeing, $t(79) = 5.38, p < .001, d = .60$. In the other two conditions, however, the opposite pattern was observed: hallucinating: $t(88) = 6.07, p < .001, d = .64$; dreaming: $t(69) = 5.41, p < .001, d = .65$. The same pattern can be observed also if focusing only on participants who completely disagreed that Steve is being attacked by a tiger.

Discussion. Results of Study 8 largely repeat the results of Study 7, suggesting once again that existence-neutral readings of “seeing” are readily available for description not only of

⁵ As in Study 7, a composite score for seeing was calculated by averaging both items (after inverting the negative one; Cronbach’s alpha was .78). A composite score for believing was calculated by averaging the four scores (Cronbach’s alpha was .94) for thinking and believing (after inverting the scales with negative formulations).

⁶ Focusing only on participants who completely disagreed that Steve is being attacked by a tiger (choosing 1 on the scale, $n = 165$, 69% of the whole sample), we see the same pattern of results. There is only one new difference that was not observed in the full sample. Namely, while in the full sample in the imagination condition there was only a statistically non-significant trend to disagree that Steve sees that he is being attacked by a tiger ($p = .071$), after exclusions participants disagreed with this claim ($p = .004$).

hallucinating, but also of dreaming. Once again, imagination presented a different pattern. Furthermore, study participants in the hallucinating and dreaming conditions took the protagonist's phenomenology to be similar to that of seeing but much less so to that of imagining. The opposite pattern was observed in the imagining condition. These results can potentially explain why the existence-neutral reading of "seeing" was much more salient for hallucinating and dreaming than for imagining in both Studies 7 and 8.

3.2.3. Study 9. Seeing

In this study, we provide a case that is explicitly described as one of seeing in order to check whether, even in this situation, there will be participants who favor existence-neutral readings of "seeing".

Materials. Participants were given a following story:

[Seeing] Suppose John is lying awake on a bed in an otherwise empty room. John looks through the open door and sees a tiger attacking him.

After reading the story, participants were given the same questions about truth, seeing and belief as in Study 7.

*Results.*⁷ The first thing to notice is that even though the story explicitly indicated that John "sees" a tiger, a large proportion of participants (44%) seem to have chosen to interpret the situation in a way that is similar to a case of hallucination (i.e., they picked responses below the middle of the scale for the truth question and above the middle of the scale for ascriptions of seeing).

While there was a moderate positive correlation between ascriptions of truth and ascriptions of seeing ($r = .38, p < .001$), seeing was ascribed even by the participants who completely disagreed (1 on a scale) that there is a tiger in John's room ($n = 55, M = 5.28, SD = 2.04, t(54) = 6.56, p < .001, d = .63$) or chose rates below the middle of the scale ($n = 94, M = 5.32, SD = 1.80, t(93) = 7.09, p < .001, d = .73$).⁸

⁷ As in Studies 7 and 8, composite score for seeing was calculated by averaging both items (after inverting the negative one; Cronbach's alpha was .78). A composite score for believing was calculated by averaging the four scores (Cronbach's alpha was .92) for thinking and believing (after inverting the scales for the negative formulations).

⁸ There were also moderate positive correlations between ascriptions of truth and believing ($r = .33, p < .001$) and between ascriptions of seeing and believing ($r = .28, p < .001$), but they are very hard to interpret given how different the participant's interpretations of what is happening in the described situation were.

Discussion. Existence-neutral readings are easily available. Even when the story explicitly suggests that the subject “sees” the tiger in the immediate environment, a large number of participants spontaneously interpret the situation presented with the word “sees” as something akin to hallucination.

3.2.4. Study 10. Justification

In this study, we wanted to see if ascriptions of “seeing” survive reflection, whether participants would find existence-neutral readings of “seeing” acceptable even after they are encouraged to reflect on this issue and write down their justifications.

Materials. Participants were asked to read the hallucination story from Study 1:

Suppose John is lying awake on a bed in an otherwise empty room. John vividly hallucinates a tiger attacking him.

After reading the story, participants were given the following task:

Please explain in one or two sentences whether John sees a tiger or not.

After typing in their justification, participants proceeded to the next page where they were asked the following question:

Which of the following two claims is a more natural description of the scenario:

John does not see a tiger, because the tiger is in his hallucination, not in his room.

John sees a tiger, but the tiger is in his hallucination, not in his room.

Results. More than three quarters of participants (77%) opted for ascription of seeing even after being given a chance to reflect on the notion of seeing, more than could be expected by chance alone: ($X^2(1, N = 30) = 8.52, p = .003$).

We also looked at the justifications provided by the participants (and provide some (unedited) qualitative examples). Indeed, approximately a quarter of participants provided justifications in which they denied that John sees a tiger (eight participants; 27%). In several cases the denial of “seeing” was justified by categorizing the event in question as imagining, e.g., “John does not physically see a tiger. John imagines seeing a tiger.” Several other

participants directly referred to the fact that there is no tiger in the room, e.g., “John does not see a tiger. A hallucination is something in the mind only, in my understanding. There is no tiger in the room therefore he cannot see it.”

A group of similar size (nine participants; 30%), however, unambiguously ascribed seeing a tiger. In some cases, ascriptions of seeing were followed by the explicit claim that the tiger is not there, that it is not real, or that it does not matter whether the tiger is there or not, e.g., “John sees the tiger, but it is not physically there.” In other cases, participants provided a more developed description of what it means to see, e.g., “John sees the tiger as all vision is the brain interpreting images, usually through information from the eyes. In this case the result is the same although the method is different. However other people would not be able to see John's tiger.”

Some (seven participants; 23%) appended their ascription of seeing the tiger with an additional specification that the tiger he sees is “in his head”, “in his mind”, or “created by his mind”, e.g., “John sees the tiger attacking him in his mind.” Two (7%) participants indicated that what John sees is something that has a tiger as its content. Namely, a “construct of a tiger” and a “vision of a tiger”, e.g., “Johns sees a vision of a tiger attacking him, not of sorts such as a simulation but I believe it is more of a hologram type image.” Another two participants (7%) ascribed to John the seeing of “an imaginary tiger” or the seeing of a tiger “in his mind”, but then wrote that they do not consider those cases to be cases of “actually seeing” or “literally seeing”. The remaining two participants (7%) did not fit into the above categories. One of them did not refer to seeing in their justification at all while the other one specified that John “believes that he is seeing a tiger”.

Discussion. Even after reflection, the vast majority of participants chose to ascribe seeing in one way or another. Justifications provided by participants were varied, but existence-neutral readings were prominent. In general, it seems that when participants wanted to make it clear that they noted the hallucinatory nature of the tiger, they did so more frequently not by denying seeing, but by appending the ascription of seeing with additional information that makes it clear that the tiger seen is not a physical, real-life tiger. For them, the main issue was not whether the tiger was seen or not, but whether the seen tiger was in the room or rather in John's mind.

4. A Positive Answer to the Puzzle of Macbeth's Dagger

As discussed in Section 2, D'Ambrosio's (2020) argument for a negative solution to Macbeth's puzzle consists in showing that "seeing" is not an existence-neutral verb; that is, that the way it is used in ordinary language is *not* neutral with respect to whether its complement exists. This allows for an account of ascriptions of seeing that are likewise *not* existence-neutral: to say that 'S sees O', it is required that O exists. Thus, it follows that Macbeth *does not* see a dagger, for it is not true that there is a dagger that he sees. *Contra* D'Ambrosio, we argued that existence-neutral readings of "seeing" are readily available to language users in a variety of contexts. This allows for an account of ascriptions of seeing that *are* existence-neutral: to say that 'S sees O', it is *not* required that O exists. We thus propose a positive solution to Macbeth's puzzle: that is, Macbeth *sees* a dagger, even if it is not true that there is a dagger that he sees.

Two distinctive aspects of our argument are worth highlighting, which we believe confer important theoretical advantages to our approach. First, unlike D'Ambrosio's studies, our studies tested for ascriptions of seeing in direct connection to Macbeth's case (Studies 3, 4, and 5). As discussed above, participants were willing to make ascriptions of seeing to Macbeth's case even when the description of the relevant scenario involved an existence-neutral verb, i.e., hallucinating. Furthermore, similar results were obtained when an explanation of the study was provided (Study 5), thus dismissing the worry that, had participants known that we were testing for the existence-neutrality of seeing, they would not use seeing in an existence-neutral way. This provides a much more direct argument to the effect that existence-neutral readings of "seeing" are readily available in the specific scenario that philosophers of perception are concerned about.

Second, our studies did not rely on *modal* assumptions about the nature of the objects of seeing. This allows us to avoid an important objection that can be raised to D'Ambrosio's argument. In the studies discussed in D'Ambrosio (2020), participants were asked to assume that a certain *class* of entities—e.g., elves—does not exist and were then asked to evaluate whether it is possible for one to see an object belonging to that class. This reliance on modal assumptions conceals a crucial ambiguity in the argument, which has to do with how the term 'existence' is understood in the question:

- (1) Is it possible for S to see O, when O does not *exist*?

There are two possibilities here. On a first reading of the term—call it the *modal reading*—‘existence’ is understood as a modal term, that is, it is defined in opposition to ‘non-existence’. Thus, (1) becomes:

(1a) Is it possible for S to see O, when O *belongs to the class of non-existent things*?

On a second reading—call it the *presence reading*—‘existence’ is understood in opposition to ‘absence’, that is, as meaning the *presence* of O. On this reading, (1) becomes:

(1b) Is it possible for S to see O, when O *is absent*?

By asking participants in his study to assume that there are no elves and other mystical entities, D’Ambrosio clearly seems to favor the ‘modal’ reading of ‘existence’.

The problem with this approach is that it is not clear whether (1a) is the sense in which philosophers of perception are interested in the question of whether it is possible for S to see O, when O does not exist. Establishing this is crucial for D’Ambrosio’s argument to succeed as a solution to the puzzle of Macbeth’s dagger. However, no argument to that effect is offered in the paper. Rather, this is an assumption that drives the discussion. And this is where, one might argue, D’Ambrosio’s argument becomes problematic.

More specifically, it could be argued that the specific sense in which the more general question (1) is controversial for philosophers of perception is (1b), and not (1a). As applied to Macbeth’s case, what would be at the center of the dispute would be the question of whether Macbeth *sees* a dagger when there is not a particular that satisfies the description of a dagger in front of him—in other words, when a dagger is *absent*. What it means to say that an object is absent is, of course, controversial. It could mean that the object in question is not causally connected in an appropriate way to a visual experience, it could mean that it is not in the perceiver’s visual field, or it could mean something else entirely. The crucial point is that whichever answer one favors, the controversy around (1) is a controversy over whether one sees in the *absence* of what is seen, or (1b). Thus, a solution to the puzzle of Macbeth’s dagger, insofar as this dispute is understood as a dispute about the conditions for making ascriptions of seeing, would require an answer to the question of whether such ascriptions can be made when the object that stands for the complement of “seeing” is absent. More specifically, the puzzle would be best understood in terms of whether a *veridical* visual experience is required for there to be an ascription of seeing.

One obvious objection here is that failing to exist in the ‘modal’ sense entails failing to exist in the ‘presence’ sense. So, distinguishing between (1a) and (1b) is irrelevant in the context of D’Ambrosio’s argument. In response, while we agree that failing to exist in the modal sense entails failing to exist in the presence sense, we do not think that distinguishing between (1a) and (1b) is irrelevant. For failing to draw this distinction conflates two different sets of intuitions one might have about when ascriptions of seeing should be made. The first set has to do with whether members belonging to a certain class of objects *could* be objects of seeing. And one requirement here seems to be that objects belonging to that class must exist in the actual world. The second set has to do with whether a particular object that belongs to an existing class (understood in the modal sense) could be the object of seeing when they fail to exist (in the presence sense) in a specific context. Now, it seems plausible that one might hold that only existent objects (in the modal sense) could be objects of seeing, while still denying that only existent objects (in the presence sense) could be objects of seeing. For instance, one might think that one cannot see a unicorn, but that one can see a piano in front of one even though there is not a piano in front of one. Such a subject would agree with D’Ambrosio that seeing is not existence-neutral (in the modal sense), but nonetheless disagree with his proposed solution to Macbeth’s puzzle. Hence, the objection does not get off the ground.

Turning back to our own argument, the studies we discussed in Section 3 do not fall prey to these difficulties. With the exception of Study 6, the other studies made use of objects that uncontroversially exist in the modal sense—i.e., tigers and daggers. Moreover, in most studies, the vignettes stated that the object of seeing was absent—e.g., “Suppose John is lying awake on a bed in an otherwise *empty* room”—and participants were explicitly asked to indicate whether they agreed with the claim that the relevant object was present in the scenario described. So, even if Macbeth’s puzzle were interpreted along the lines of (1b) above, our argument would still stand as an argument for the existence-neutrality of seeing, and as such, as an argument for a positive answer to Macbeth’s puzzle.

A more general worry here is that even if we are right that existence-neutral readings of “seeing” are readily available to language users, this does not in itself imply a positive answer to Macbeth’s puzzle. In particular, it might be argued that solving the puzzle requires more than providing an account of when language users are willing to make ascriptions of seeing. It requires, in addition, an account of the nature of perceptual experiences (Crane & French, 2017). If, for instance, perceptual experiences are defined in terms of a *relation* of acquaintance between a subject and an object (e.g., Campbell, 2002; Martin, 2004; Fish, 2009; Brewer, 2011), then even if language users are willing to make ascriptions of seeing to Macbeth’s case,

it is not true that Macbeth sees a dagger, for he fails to have a perceptual experience of a dagger. Now, *relationalism* or *naïve realism* is just one way to conceive of the nature of perceptual experiences, but if the view is to be taken seriously—which it has been in the recent perception literature (see, e.g., Crane, 2006; Fish, 2010; Crane & French, 2017 for general discussions)—there is reason to suspect that the strategy we adopt here is at best incomplete.

In response, we acknowledge that a full solution to the puzzle of Macbeth’s dagger might require considerations that go beyond those related to the question of whether existence-neutral ascriptions of seeing are readily available to language users. Our focus on existence-neutrality here is mainly due to our attempt to respond to D’Ambrosio’s (2020) argument, which makes the same assumption called into question here. So, one important qualification is that, insofar as Macbeth’s puzzle is viewed as a dispute about existence-neutrality, the negative argument developed in Section 3 supports the positive argument offered in this section. It is important to note, moreover, that even if one finds this qualification unsatisfactory, concerns pertaining to our positive argument should not threaten the negative argument offered above. That is, even if we set aside the question of whether Macbeth sees a dagger, the negative argument still stands as an argument for the existence-neutrality of seeing.

In summary, then, we conclude that, together with the empirical argument for the existence-neutrality of seeing developed in Section 3, the two theoretical advantages discussed in this section give us strong reasons to favor a positive answer to Macbeth’s puzzle.

5. Conclusion

In this paper, we provided two arguments concerning the existence-neutrality of “seeing”. First, through a set of ten studies we developed an empirical argument in support of the idea that existence-neutral readings of “seeing” are readily available to language users in a variety of contexts. Seeing is readily ascribed in cases of hallucinating (Studies 1-8, and 10) and dreaming (Studies 7-8); in cases where entities are absent in a given scenario (like daggers and tigers, Studies 1-5, 7-8, and 10) and where they do not exist in general (like elves, Study 6); and when considered in relation to different constructions, such as “*x* sees *y*” (Studies 1-7 and 9-10) and “*x* sees that *y*” (Study 8). We also showed that a significant proportion of participants spontaneously interpret situations that are explicitly described as cases of seeing in a way that does not presuppose the existence of its objects (Study 9). Furthermore, an existence-neutral reading of “seeing” is readily accepted even when study instructions explicitly say that the task of the study is to find out whether “seeing” functions more like paradigmatically existence-neutral verbs, like “wanting”, or non-existence-neutral verbs, like “riding” (Study 5). Finally,

we showed that existence-neutral ascriptions of seeing survive reflection—i.e., the majority of study participants still ascribe seeing in cases of hallucinating even after being asked to reflect in writing on whether the subject sees the object (Study 10). This was our *negative* argument. Second, and finally, we argued that the negative argument supports a positive answer to the puzzle of Macbeth’s dagger: given that existence-neutral readings of “seeing” are readily available to language users, it follows that Macbeth sees a dagger. This was our *positive* argument. While related to one another in important ways, the success of the negative argument is independent of the success of the positive argument. So, even if readers are skeptical of the latter, there are still strong independent reasons to endorse the former.

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