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Social facts, circularity and causal-historical connections in experimental semantics

(Hechos sociales, circularidad y conexiones histórico-causales en la semántica experimental)

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ABSTRACT: This paper offers a critical analysis of Ding and Liu's (2022) contribution to the ongoing debate stemming from Machery *et al*.'s (2004) experimental investigation of Kripke's Gödel Case. Machery *et al*. test referential intuitions on proper names among laypeople from American and Chinese backgrounds and contend that their results challenge Kripke's refutation of descriptivism. Ding and Liu argue that descriptions in Gödel-style scenarios are ambiguous between a brute-fact and a social-fact interpretation, and Machery *et al*. overlook the latter. Building upon this ambiguity, Ding and Liu conduct several studies, maintaining that the results reveal that Machery *et al*. misclassify some descriptivist answers as causal-historical. If that is the case, the challenge that experimental philosophy poses to Kripke's refutation of descriptivism is even more substantial than Machery *et al*. claim. In this paper, I argue that, even granting some specific points that Ding and Liu endorse, their main experiment (Study 3) fails to provide the intended evidence. Despite the authors' attempted rejoinders, the social-fact interpretation of the description in the Gödel Case is either circular or implicitly presupposes a referential role for the name's causal-historical chain. Hence, in contrast to Ding and Liu's interpretation, from their premises, they can only conclude that their main experiment's results do not bolster Machery *et al*.'s (2004) challenge against Kripke's refutation of descriptivism, but rather diminish it.

KEYWORDS: cross-cultural variation, experimental semantics, proper names, theory of reference.

RESUMEN: *Este artículo ofrece un análisis crítico de la contribución de Ding y Liu (2022) al debate en curso derivado de la investigación experimental de Machery et al. (2004) sobre el Caso Gödel de Kripke. Machery et al. ponen a prueba las intuiciones referenciales sobre los nombres propios de personas de origen estadounidense y chino y sostienen que sus resultados desafían la refutación del descriptivismo de Kripke. Ding y Liu argumentan que las descripciones en escenarios al estilo de Gödel son ambiguas entre una interpretación de hecho bruto y una interpretación de hecho social, y que Machery et al. pasan por alto esta última. Basándose en esta ambigüedad, Ding y Liu llevan a cabo varios estudios y sostienen que los resultados revelan que Machery et al. clasifican erróneamente algunas respuestas descriptivistas como histórico-causales. Si ese es el caso, el desafío que la filosofía experimental plantea a la refutación del descriptivismo por parte de Kripke es aún más significativo de lo que afirman Machery et al. En este artículo, sostengo que, incluso concediendo algunos puntos específicos defendidos por Ding y Liu, su experimento principal (Estudio 3) no proporciona la evidencia pretendida. A pesar de los intentos de réplica de los autores, la interpretación de hecho social de la descripción en el Caso Gödel es o bien circular o bien presupone implícitamente un papel referencial para la cadena histórico-causal del nombre. Por lo tanto, contra la interpretación de Ding y Liu, a partir de sus premisas, solo se puede concluir que los resultados de su experimento principal no refuerzan el desafío de Machery et al. (2004) contra la refutación del descriptivismo por parte de Kripke, sino que más bien lo debilitan.*

PALABRAS CLAVE: variación transcultural, semántica experimental, nombres propios, teoría de la referencia.

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1. *Introduction*

Ding and Liu (2022) is one of the most recent and noteworthy experimental contributions within the ongoing discussion on the reference of proper names, stemming from the seminal study conducted by Machery, Mallon, Nichols and Stich (henceforth MMNS) (Machery *et al*. 2004).[1]

The focal point of the debate centers around the Gödel Case, introduced by Kripke in *Naming and Necessity* (1980, pp. 83-84), which portrays a scenario where Gödel is not the real discoverer of the incompleteness theorem. He stole it from another man, called "Schmidt". The theft remained undetected and the discovery of the incompleteness theorem is everything that was passed down over time. As a consequence, people associate the name "Gödel" with one description only, "The discoverer of the incompleteness theorem". According to the Descriptivist Theory (DT), proposed by Russell (1905, 1918/1919, 1919) and arguably Frege (1892), the speakers using "Gödel" in the fictional scenario refer to Schmidt, as that individual satisfies the description that they associate with the name.[2] According to the Causal-Historical Theory (CHT), proposed by Kripke (1980), those speakers refer to Gödel, as that individual is at the origin of the name's communication chain. Traditionally, philosophers have endorsed Kripke's intuition and therefore CHT has gained support over DT.[3]

MMNS raise an experimental challenge. They administer two scenarios modeled after Kripke's Gödel Case to two groups of laypeople, specifically American and Hong Kong undergraduates. Each participant receives both scenarios (in English). One uses the name "Gödel", while the other a name more familiar to the Chinese sample, "Tsu Ch'ung Chih". Presented below is the scenario with "Gödel":

> Suppose that John has learned in college that Gödel is the man who proved an important mathematical theorem, called the incompleteness of arithmetic. John is quite good at mathematics and he can give an accurate statement of the incompleteness theorem, which he attributes to Gödel as the discoverer. But this is the only thing that he has heard about Gödel. Now suppose that Gödel was not the author of this theorem. A man called "Schmidt", whose body was found in Vienna under mysterious circumstances many years ago, actually did the work in question. His friend Gödel somehow got hold of the manuscript and claimed credit for the work, which was thereafter attributed to Gödel. Thus, he has been known as the man who proved the incompleteness of arithmetic. Most people who have heard the name "Gödel" are like John; the claim that Gödel discovered the incompleteness theorem is the only thing they have ever heard about Gödel. When John uses the name "Gödel", is he talking about:
>
> (a) the person who really discovered the incompleteness of arithmetic? or

[1] All unidentified citations in this paper are to Ding and Liu (2022).

[2] Dummett (1973, pp. 110-111) objects that Frege does not fully adhere to descriptivism concerning proper names. However, as Kripke (1979) notes, "the philosophical community has generally interpreted Fregean senses in relation to descriptions" (p. 271, n. 3). In any case, the philological details of Frege's view have no bearing on the arguments in this paper.

[3] In this paper, "DT" denotes what some authors call "classical description theory" (e.g., Devitt & Sterelny, 1999, pp. 45-65) or "classical descriptivism" (e.g., Martí, 2014, p. 24), as outlined by Russell and arguably Frege, in contrast to other variants of the theory. For a presentation of the different guises that descriptivism can take, see Devitt and Sterelny (1999, pp. 45-65).

(b) the person who got hold of the manuscript and claimed credit for the work?
(Machery *et al*., 2004, p. B6)

Option (a) represents the descriptivist intuition. John associates "Gödel" only with "The discoverer of the incompleteness theorem" and thus refers to the individual who accomplished that result. (b) represents the causal-historical option, as the thief is the individual at the origin of the name's communication chain. Across the two scenarios, on average, 57% of Americans and 31% of Chinese choose the causal-historical answer.[4] Hence, MMNS detect a cross-cultural variation in referential intuitions: Americans tend toward CHT, while Chinese toward DT. In addition, MMNS observe an intra-cultural variation, as a non-negligible minority of each group defends the intuition that prevails within the other group. The data seem to invalidate the universality of the causal-historical intuition that Kripke employs to refute DT.

MMNS faced objections on various fronts —for a comprehensive overview, see Machery (2021, 2024). Adding to the body of critical literature, Ding and Liu (2022) emerges as another notable contribution that challenges MMNS's experiment. However, while the previous works tended to downplay the value of MMNS's attack against Kripke's refutation of DT, Ding and Liu's objection aims to strengthen MMNS's provocative stance. Ding and Liu contend that the description "The discoverer of the incompleteness theorem" is ambiguous, as participants can understand it according to two interpretations. MMNS overlook one of them and thus erroneously classify some descriptivist answers as causal-historical, thereby underestimating the descriptivist evidence that their experiment provides. If Ding and Liu's criticism is correct, the threat to Kripke's refutation of DT is even more substantial than MMNS claim.

For the sake of the discussion, in this paper I do not question the evidential status of referential intuitions (for a criticism of their reliability, see Martí, 2009, 2012, 2014; Devitt, 2011, 2012, 2015; for a defense, see Machery *et al*., 2009; Machery, 2011, 2012, 2014). Ding and Liu contend that "there's room for the kind of experimental approach" of their work, based on referential intuitions (p. 294), and thus there is no definitive evidence against using them instead of alternative data sources such as truth-value judgments (Machery *et al*., 2009; Vignolo & Domaneschi, 2018, 2022; Li *et al*., 2018; Domaneschi & Vignolo, 2020; Li, 2021, 2023a) or linguistic production (Domaneschi *et al*., 2017; Vignolo & Domaneschi, 2018; Devitt & Porot, 2018).[5]

[4] The data in percentage terms are reported in Machery and Stich (2012).

[5] Ding and Liu do not provide a full-fledged argument in support of the reliability of referential intuitions as opposed to truth-value judgments or linguistic production. The authors restrict themselves to the claim that this conclusion is suggested by their "brief survey of the recent literature", in which they quickly outline the diverging stances of the different authors engaged in the debate (p. 294). Additionally, it is worth noting that Ding and Liu do not specifically talk of linguistic "production", but rather of linguistic "usage", and they consider the literature on whether truth-value judgments indicate usage. That said, their main point remains that "there is no conclusive reason against testing laypeople's referential intuitions to determine whether a certain theory is true" (p. 294). Finally, it should be stressed that, while I mention the works by Domaneschi *et al.* (2017), Vignolo and Domaneschi (2018) and Devitt and Porot (2018) as all being production studies, only the latter is a pure test of production, where participants generate their responses by using their own words. In contrast, in the first two studies, participants complete sentences or answer questions by selecting from a predetermined range of options.

After elucidating Ding and Liu's criticism and presenting their experimental studies, I argue that their arguments fail and their results do not provide the intended evidence. The purported ambiguity that the authors put forward does not offer grounds to assert that MMNS erroneously categorize some descriptivist answers as causal-historical. On the contrary, from their premises, Ding and Liu can only conclude that their main experiment (Study 3) bolsters the contrary claim —some causal-historical evidence is incorrectly classified as descriptivist.

2. *Brute facts and social facts*

Ding and Liu contend that MMNS rely upon a wrong premise (p. 295). MMNS assume that participants can understand John's description

> D0: "The person who discovered the incompleteness of arithmetic"

only as

> D1: "The person who actually discovered the incompleteness of arithmetic".

However, the authors maintain that another interpretation is available:

> D2: "The person who is widely believed to have discovered the incompleteness of arithmetic".

D1 focuses on the "brute fact", namely, on the person who factually discovered the theorem. Instead, D2 focuses on the "social fact", namely on the person whom the people within a linguistic community take to have made that discovery (p. 296). As they try to show through their Study 1, Ding and Liu contend that people are likely to understand a description in social-fact terms "when the information about a specific individual is limited" (p. 300). If the information is scant, the speaker will likely be cautious about its reliability. She will not assert that the person in question did X, but will restrict herself to the more cautious claim that people attribute X to that individual. The limited amount of information is a crucial aspect of the Gödel Case. The only description that John and his linguistic community associate with "Gödel" is "The discoverer of the incompleteness theorem". Speakers do not associate additional details regarding education, other accomplishments or personal life.

Based on these considerations, Ding and Liu invite us to suppose that a descriptivist participant undertakes the experiment by adopting D2. They contend that this participant will answer that John is talking about the thief, namely Gödel, because that individual satisfies D2.[6] He was clever enough to steal the theorem and convince others that he himself was the author of the proof. According to the authors, this participant expresses a descriptivist intuition, because Gödel is taken as the name's referent by virtue of the satisfactory relation between him and a description, D2. Contrary to what MMNS assume, the answer

[6] Throughout I use Gödel (without quotes) to talk about the thief and Schmidt (again, without quotes) to talk about the real discoverer.

that John is talking about the thief does not necessarily express a causal-historical intuition. Since MMNS overlook D2 as a possible interpretation of D0, they may erroneously classify some descriptivist answers as causal-historical. Consequently, the descriptivist evidence could potentially exceed MMNS's suggested extent.[7]

3. The experiments

Ding and Liu substantiate their challenge by conducting three studies. Study 1 aims to show the plausibility of the social-fact interpretation of descriptions that contain limited information. Study 2 aims to replicate MMNS's and Machery *et al*.'s (2010) results with a sample from Mainland China and a vignette in simplified Chinese. Thus, Ding and Liu fill a gap in the literature: MMNS test Hong Kong participants with vignettes in English; Machery *et al*. (2010) replicate MMNS's results with Hong Kong participants and a vignette in traditional Chinese. Study 2 is also a controlled baseline for Study 3, in which Ding and Liu administer a disambiguated Gödel scenario that is designed on the basis of the two purported interpretations of D0.

3.1. Study 1 and 2

Ding and Liu conduct Study 1 to bolster the plausibility of a social interpretation of D0. They administer a revised version of MMNS's Gödel Case to a group of participants from Mainland China in simplified Chinese. Ding and Liu's revised scenario omits both the theft narrative and the characters of Schmidt and John. It just presents the information that people transmitted in relation to the name "Gödel" over time, and the final prompt asks the participant whom she regards Gödel to be.

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[7] One might object that Ding and Liu's formulation of D2, in which Gödel is presented as "the person who is widely *believed* to have discovered the incompleteness of arithmetic", contradicts their goal to capture the intuition of those participants who take John and his community to question the reliability of the scant information that they inherited. The line of reasoning is as follows: if John and his fellows doubt the received information, then they do *not* believe that the name's referent is the discoverer of the theorem—that is exactly what they doubt. Therefore, a more precise formulation could be "the person who is widely *conventionally attributed* to have discovered the theorem". Conventionally attributing a result to a person is consistent with the belief that the person actually achieved the result, but it also allows for neutrality or even disbelief in her achievement. For instance, a linguistic community may conventionally attribute the discovery of the New World to Columbus, while believing that he was likely not the actual first Westerner to arrive in the New World. That said, two Chinese speakers, to whom I am grateful for their assistance in interpreting the original text in this and the forthcoming cases, have informed me that the Chinese formulation of D2, as it appears in option (b) of Study 1 and option (a) of Study 3 (pp. 306-307), could be rendered also with "acknowledged" or "recognized" instead of "believed", which might perhaps circumvent the above criticism. In any case, my main objections against Ding and Liu's experiments, as I show in the relevant sections (4 and 5), do not depend on the choice of rendering D2 with the verb "believe", "attribute", "acknowledge" or any other semantic nuance. Therefore, I proceed on the assumption that D2 effectively captures the supposed intuition of those participants who take John and his fellows to doubt the reliability of the scant information that they received.

> Suppose that you have learned in college that Gödel is the man who proved an important mathematical theorem, called the incompleteness of arithmetic. You are quite good at mathematics and can give an accurate statement of the incompleteness theorem. But this is the only thing that you have heard about Gödel. Most people are like you; the claim that Gödel discovered the incompleteness theorem is the only thing they have ever heard about Gödel. Do you regard Gödel as:
>
> (a) the person who really discovered the incompleteness of arithmetic? or
>
> (b) the person who is widely believed to have discovered the incompleteness of arithmetic?
>
> (P. 299)[8]

Option (a) corresponds to the brute-fact interpretation of D0, namely D1, while (b) corresponds to the social-fact interpretation, namely D2. Ding and Liu find that 84% of participants choose (b) and 16% (a). These results, they argue, corroborate the thesis that, when the received information is limited, speakers are strongly inclined to doubt its reliability and adopt a social interpretation.[9]

These findings add a new potential confounding factor to a series of previously suggested ones indicating that, in the context of the Gödel Case, participants do not take certain phrases and predicates as one may expect. For example, Sytsma and Livengood (2011) and Vignolo and Domaneschi (2022), by testing American and Italian participants respectively, contend that some of them take the sentence "John talks about the discoverer of the incompleteness theorem" as "John talks about the person who he believes is the discoverer of the incompleteness theorem". Domaneschi and Vignolo (2020), with an Italian sample, and Li (2021), with American and Chinese samples, report that, when participants answer that John's claim "Gödel is the discoverer of the incompleteness theorem" is "true" or that John "is right" to utter that claim, most of them do not mean that the statement is "factually true", but rather that it is "taken as true by John" or "true from John's perspective".[10]

Study 1 corroborates the thesis that it is in fact possible for participants to address a Gödel scenario by adopting D2. However, one can observe that, when that happens, participants depart from what D0 literally says. There is a distinction between wondering who accomplished a result and whom a group of people considers to have accomplished it.[11] Ding and Liu acknowledge a disparity between D0 and D2 and explain that one may contend that "people who accept the description of the social fact may lack a sense of logic" (p. 298). Nonetheless, they add that "[t]he most crucial point is not what people should do, but what people actually do" (*ibidem*) and "in a real population of language users, you can find some people [...] regard D0 as saying D2 straightforwardly" (p. 296). Hence, they

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[8] In this and all the forthcoming instances, the text presents the English translations as provided by Ding and Liu.

[9] Ding and Liu also administer an additional case to a different sample. The case is structurally analogous to the one presented in the main text, with the difference being that it involves a name —"Bi Sheng"— and a scenario more familiar to Chinese speakers. The results of this additional case confirm the participants' inclination to interpret the reference-fixing description in social terms, and even to a stronger degree, as virtually the totality of the sample —97%— selects that option. In their other studies, Ding and Liu only use the Gödel Case.

[10] It is worth specifying that Domaneschi and Vignolo (2020) and Li (2021) do not use the Gödel-Schmidt story, but the conceptual point remains unaffected.

[11] Devitt (2023, pp. 1151-1154) raises similar observations while discussing the various readings of the truth predicate that Li (2023a, pp. 65-68, 92-127) proposes. For Li's reply to Devitt, see Li (2023b).

argue that "D0 can typically mean D1 or D2" (p. 296) and that there is a "descriptive ambiguity" (to quote their article's title). However, while Ding and Liu never claim that the ambiguity at stake is between two literal meanings, they fail to explicitly present it as an ambiguity between a literal interpretation and a non-literal interpretation of a description, which is probably a point that they should have emphasized. In line with Ding and Liu's terminology, which comprises claims to the effect that "D0 can also be interpreted as D2" (p. 295) or "[i]t is reasonable to interpret D0 as D2" (p. 296), I present D1 and D2 as interpretations of D0. However, it is worth noting that the participant adopting D1 interprets D0 literally, contrary to the one employing D2.[12]

It is possible to raise a criticism against the supposed origin of the ambiguity of D0. As seen, Ding and Liu contend that the cause of the participants' social-fact interpretation of D0 in their Study 1 consists in the scarcity of information that D0 contains. However, while Study 1 corroborates the thesis that a large majority of participants in fact opt for that interpretation, one may raise doubts about the etiology of that phenomenon. In order to show the critical role of information scarcity, one should manipulate that variable, by administering to a group of participants also a scenario in which the name is associated with a richer amount of information (not just the discovery of a theorem, but also other scientific accomplishments, biographical facts, and additional details). If in that circumstance participants are more inclined to opt for the brute-fact interpretation of the description, that would be evidence that the determining factor is the quantity of information transmitted over time in association with a name.

In Study 2, Ding and Liu present a simplified Chinese version of the Gödel Case that Machery *et al*. (2010) administer in traditional Chinese, which in turn follows the English formulation that MMNS use. With their sample from Mainland China, Ding and Liu replicate the results of the previous literature: 72% of participants express the referential intuition that John talks about the real discoverer, and the remaining 28% express the intuition that John talks about the thief. In what follows, I examine Study 3 in detail.

3.2. Study 3

In Study 3, Ding and Liu administer the same vignette as in Study 2 to a sample from Mainland China. The innovative part regards the final prompt, which seeks to disambigu-

[12] Two considerations are worth pointing out. First, following for instance Searle (1979, p. 150, n. 3), one may question the appropriateness of the term "ambiguity" as applied to the oscillation between a literal interpretation of an expression and a non-literal interpretation of it, such as a "pragmatic meaning". Second, one may question whether D2 is an *interpretation* of D0 in the first place. When, in the context of Study 1, the participant is told in college that "Gödel is the discoverer of the incompleteness theorem", likely by her teacher, what guides the participant's adoption of D2 —according to Ding and Liu— is not an effort to grasp any non-literal implication by the teacher —who, in fact, might truly intend that the name's referent is the real discoverer of the theorem. Rather, what guides the participant's adoption of D2 is her skepticism about the reliability of the information that the teacher provides. This skepticism prompts the participant to consider D2 as an alternative to D0. In other words, D2 is not the output of an interpretative effort aiming to decipher the teacher's intended meaning beyond her literal words; D2 is rather a new proposal concerning the identity of the name's referent, prompted by doubts about the accuracy of D0. Therefore, D2 would not be an interpretation of D0, but an alternative that replaces D0.

ate the various interpretations of D0. The authors present a reason-based prompt: each option includes not only the name's referent, but also the reason that individual would be the referent of John's use of "Gödel". These are the options:

> When John uses the name "Gödel", he is talking about:
> (a) the person called "Gödel", because he is widely believed to have discovered the theorem.
> (b) the person called "Schmidt", because he really discovered the theorem.
> (c) the person called "Gödel", because his real name is "Gödel".
> (d) the person called "Schmidt", because this name refers to him intuitively.
> (P. 303)

Option (a) is conceived for the descriptivist participant who understands D0 according to the social-fact interpretation. According to Ding and Liu, "the person called 'Gödel'" picks out the thief and that individual would be the referent of the name that John uses because he satisfies D2. As I illustrate shortly, the authors' construal of (a) and also of the other options is open to dispute. (b) is supposed to be the alternative for the descriptivist participant who understands D0 according to a brute-fact interpretation. "The person called 'Schmidt'" would select the discoverer of the theorem and that individual would be the name's referent because he satisfies D1. The authors consider (c) as the option for the causal-historical participant, as it stresses that "Gödel" is the name that the thief was originally given.[13] Option (d) is to balance the choices, because in this way "'Gödel' and 'Schmidt' appeared the same times in the probe" (p. 303). Given the vague explanation figuring in (d), the authors treated the option "as neither descriptivist intuition nor Kripkean intuition" and excluded the two participants (out of 136) choosing (d) from the final analysis (p. 304).

Ding and Liu's construal of options (a) and (c) might be disputable. One may critically contend that the claim that "John is talking about the person called 'Gödel'" is consistent with any theory of reference: all theories predict that the name "Gödel" refers to the individual called "Gödel".[14] They disagree upon the mechanism that determines who the individual called "Gödel" is. According to DT, when John and his fellows use "Gödel", they refer to the individual X who satisfies the description that they associate with the name. Therefore, for the descriptivist, "Gödel" is the name by which X is *called* within John's linguistic community. According to CHT, when John and his fellows use "Gödel", they refer to the individual Y who is at the origin of the communication chain, and therefore "Gödel" is the name by which Y is *called* within John's linguistic community. X and Y may or may not coincide, but that is beyond the point: what matters is that those are the individuals whom DT and CHT determine as the ones called "Gödel" within John's community.

The phrase "the person called 'Gödel'" appearing in options (a) and (c) unequivocally picks out the thief, in line with Ding and Liu's interpretation, if the participant interprets "called 'Gödel'" as "the individual whom *the narrator of the story* calls 'Gödel'". It is beyond

[13] I have been informed that, in light of the Chinese text for option (c) (p. 307), the word "real" is to be understood with the sense of "original", indicating the first name that an individual is given from a chronological point of view and by which she is first known in her linguistic community.

[14] Unless the name is empty, in which case there is no individual and the name fails to refer. I will take this caveat for granted also in the forthcoming reflections.

question that the narrator uses the name "Gödel" to talk about the thief and not the real discoverer. For example, when the narrator states "Now suppose that Gödel was not the author of this theorem" and "His friend Gödel somehow got hold of the manuscript and claimed credit for the work", she invites participants to imagine that, in the vignette's fictional scenario, a thief stole the theorem from another man, and the narrator does so by employing "Gödel" as a name of the former individual.

Arguably, participants are likely to interpret "the person called 'Gödel'" as "the person whom the narrator of the story calls 'Gödel'", since the alternative reading "the individual whom John's community calls 'Gödel'" makes the answers tautological: as said, John uses the name "Gödel" to talk about the individual whom his community calls "Gödel", whoever that is. However, conceptually speaking, Ding and Liu's interpretation is not the only possible one, and the formulation of their options would have been more effective if it had mentioned the narrator of the story.[15]

Option (b) states that, by using "Gödel", John talks about "the person called 'Schmidt'", who —according to Ding and Liu's intended interpretation— is the real discoverer of the theorem. One may suggest that, if it is automatically true that John is talking about the person whom his community calls "Gödel", then it is false that John is talking about the person whom his community calls "Schmidt". If that is the case, the option is not accessible either to a descriptivist or a causal-historical participant. The situation in this case is subtler, though. As discussed, option (b) is introduced for the descriptivist participant who adopts D1. The vignette does not specify whether John and his fellows' mental lexicon also includes "Schmidt" and whether John and his fellows associate that name with a description uniquely picking out the real discoverer of the theorem —such as "The mathematician whose body was found in Vienna under mysterious circumstances". If that is the case, then John, when using the name "Gödel", would unknowingly be talking about not only the individual whom his community calls "Gödel", but also the one whom his community calls "Schmidt", as both names pick out the same referent. Again, participants likely read "the person called 'Schmidt'" as "the person whom *the narrator of the story* calls 'Schmidt'", in line with Ding and Liu's intended construal.[16] That interpretation enables

[15] For example, Sytsma and Livengood (2011), in their attempt to address an epistemic ambiguity that they take to afflict MMNS's final prompt, reformulate the prompt by introducing some clarifying modifications, among which is the use of the phrase "the person who *the story* says" (p. 322, my emphasis). Sytsma and Livengood (2011) test American participants, and Sytsma *et al.* (2015) apply the same clarification with American and Japanese samples.

[16] A difference between the occurrences of "Gödel" and "Schmidt" within the vignette is that, while the narrator happens to use "Gödel" to talk about the thief, she never uses "Schmidt" to talk about the real discoverer of the theorem. The narrator talks about "a man called 'Schmidt'": this phrase appears in MMNS's English version of the vignette once, while in Ding and Liu's Chinese translation twice; however, what is constant is that the name is not used, but mentioned (for instance, the narrator does not say that "Schmidt discovered the theorem", but that "a man called 'Schmidt'" did). Arguably, nothing essential hinges on that difference, for two reasons. First, interpreting "the person whom the narrator of the story calls 'Schmidt'" as denoting the discoverer requires only that the narrator introduces the discoverer with the name "Schmidt", which she does by stating that the person who did the work was "a man called 'Schmidt'". Second, given that the narrator uses "Gödel" to talk about the thief, it seems reasonable to assume that, had he used the name "Schmidt" as well (rather than just mentioning it), she would have used it to refer to the real discoverer.

the participant to read the phrase straightforwardly, without wondering whether John's mental lexicon includes the name "Schmidt". However, also in this case, conceptually speaking, Ding and Liu's interpretation of the phrase is not the only possible one, and the formulation of their option would have been more effective if it had mentioned the narrator of the story.[17] That said, my critical analysis in sections 4 and 5 assumes that participants understand the final prompt's options under Ding and Liu's intended interpretation, where "the person called 'Gödel'" and "the person called 'Schmidt'" unequivocally denote the thief and the discoverer, respectively.

Figure 1 reports the results of Study 3, following the bar chart format that Ding and Liu use in their Figure 3 (p. 304).

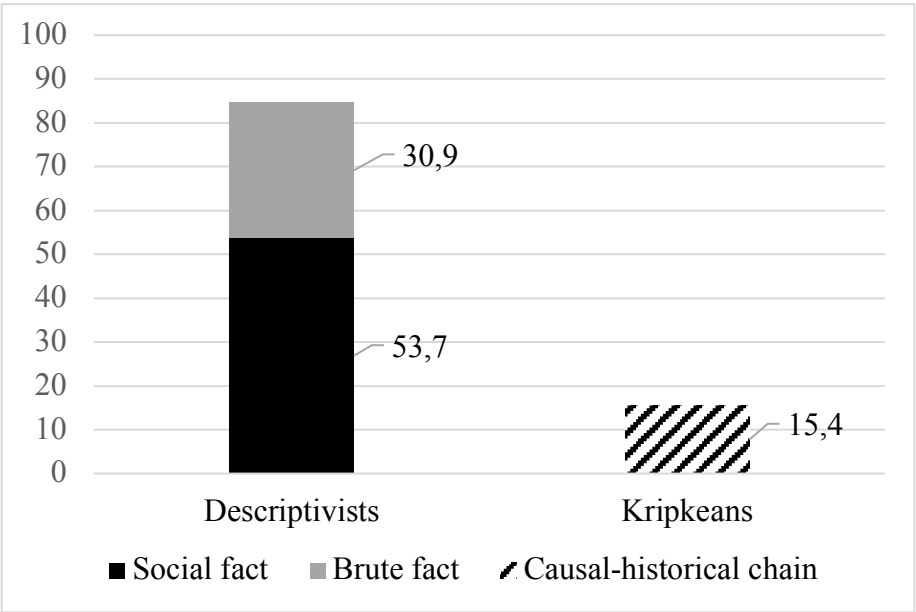

Figure 1
Results (%) of Ding and Liu's (2022) Study 3

[17] Since (d) encompasses "the person called 'Schmidt'" as well, similar considerations extend to that option, although —as said— Ding and Liu discard the participants selecting it. In this respect, the decision to rule out the participants choosing (d) may be disputable. After all, however vague the explanation figuring in (d) may be, the option states that John's use of "Gödel" refers to the discoverer of the theorem (assuming the authors' intended construal of "the person called 'Schmidt'"). Only DT can account for this answer. Therefore, it may be argued that option (d) should count as descriptivist. However, out of a total of 136 participants, only two choose (d), with two additional ones —besides the 136 participants— excluded due to their excessively short completion time of the questionnaire. Consequently, the impact of the participants selecting (d) on the interpretation of Ding and Liu's results is negligible.

The percentage of causal-historical intuitions (15%) is statistically significantly lower than the one of Study 2 (28%). More generally, it falls below the percentages of MMNS's work and of the literature with Chinese samples (e.g., Machery *et al*., 2010; for an overview of the results, see Machery, 2021, 2024). Furthermore, the majority of participants —54%— opt for the purportedly descriptivist answer relying on the social-fact description. According to Ding and Liu, these results show that the unnoticed ambiguity of D0 affected the previous referential-intuition tests in the literature and that the descriptivist evidence amongst Chinese surpasses MMNS's suggested extent. Therefore, the challenge that experimental philosophy poses to Kripke's refutation of DT would be even more significant than what the philosophical community has usually taken. These data regard Chinese participants, but similar results could potentially arise amongst Western ones as well.

Ding and Liu consider two potential criticisms against their studies and try to rebut them (pp. 297-298). First, under the assumption that DT is true, the social-fact construal of D0, namely D2, is circular and thus fails to establish any referent for the name "Gödel". Second, D2 implicitly assumes that the name's causal-historical chain plays a referential role, *contra* what DT admits. In the forthcoming sections, I strengthen these objections and argue that Ding and Liu's handling of them is unsatisfactory.

4. D2 is circular

Kripke (1980, pp. 89-90) expresses a concern that bears relevance to Ding and Liu's work. As Ding and Liu explain, "Kripke did argue something to the effect that [if DT is true] a statement such as 'Gödel is the person who is widely believed to have discovered the incompleteness of arithmetic' [...] is a circular statement". If that is the case, "no one can use it [the above statement] to actually find out what the real referent of the name 'Gödel' is and figure out any properties Gödel possesses" (p. 297). The authors address the concern in these terms:

> We argue that the circularity charge does not apply to our case, such as D2, which has an independent descriptive meaning from D1 for D0. Indeed, such statements as "we use the name 'Gödel' to refer to the man that we call 'Gödel'" and "we attribute this achievement to the man to whom we attribute it" are circular; but a statement as this, "we use the name 'Gödel' to refer to the man to whom the achievement is commonly attributed" are not. The statement contains two different verbs ("refer to" and "attribute to"), involving two different kinds of judgment (reference and attribution).
>
> (P. 297)

Therefore, a statement such as S "We use the name 'Gödel' to refer to the man who is widely believed to have discovered the incompleteness theorem", that is "We use the name 'Gödel' to refer to the satisfier of D2", would not be circular because S refrains from using any verb twice and so entails two different judgments (reference and belief). However, the authors neglect to analyze the implications deriving from S and thus fail to recognize that S involves a repetition of "Gödel", resulting in circularity.

To figure out the referent of John's use of "Gödel", the descriptivist participant will follow the instructions that S provides and thus consider D2, namely the description "The

person who is widely believed to have discovered the incompleteness of arithmetic". Consequently, this participant will wonder whom John's linguistic community considers as the discoverer of the theorem. For this purpose, she will imagine how a representative of the community, for example John, would answer the question: "Who do you believe is the discoverer of the incompleteness theorem?". Given what the vignette says, John would answer: "Gödel". This reply shows that John holds the belief that "Gödel is the discoverer of the incompleteness theorem". At this point, the descriptivist participant needs to figure out the referent of the occurrence of "Gödel" appearing in that belief. For this purpose, she will consider the description fixing the name's referent within John's linguistic community. As S specifies, that description is D2. Hence, the participant reverts to her starting point and the circularity becomes evident. In light of these reasons, Ding and Liu do not appropriately answer Kripke's concern about the circularity of a description such as D2.

5. D2 involves causal-historical connections

Ding and Liu claim that "[a]nother worry about the validity of D2 is that it may involve potential causal connections" (p. 297), that is, a reference-borrowing mechanism. When in the past Gödel, after the theft, presented himself as the discoverer of the incompleteness theorem at conferences, other people perceived him directly. Therefore, they formed the belief that he was the discoverer of the theorem and expressed it by claiming: "Gödel is the discoverer of the incompleteness theorem". Subsequent language users "borrowed the name through chains of communication, making Gödel [i.e., the thief] the widely believed discoverer of the theorem" (p. 297). Those chains involve any speaker who learned the name "Gödel", ultimately including also John and his fellows. Therefore, the thief became the object of John and his fellows' belief and thus the satisfier of D2. If that reconstruction is correct, it seems problematic for DT because a "causal-historical link plays a role in D2" (p. 298). Hence, those participants choosing (a), namely the option stating that John talks about Gödel because that individual "is widely believed to have discovered the theorem", would not express a pure descriptivist intuition, but rather a "hybrid" one (p. 297).[18] Ding and Liu reject the criticism with three arguments. In what follows, I try to show that they all fail.[19]

[18] The intuition would be hybrid between a causal-historical one and a descriptivist one, where the former component would consist in the role assigned to the name's communication chain, while the latter in the fact that Gödel is the name's referent because he satisfies D2, which ultimately remains a description. As I am about to argue, the role that the name's chain acquires is such as to make the intuition not descriptivist at all, whether in a pure or hybrid way: the intuition is causal-historical *tout court*.

[19] Although Ding and Liu do not note or emphasize this aspect, there is a possible connection between the first criticism that they consider (the circularity problem) and the referential role that D2 may attribute to the name's communication chain. As I have argued, the participant considering John and his fellows' belief that "Gödel is the discoverer of the incompleteness theorem" needs to determine the object of that belief. If the participant does that by appealing to the descriptive material that is supposed the fix the reference of "Gödel" within John's linguistic community, namely D2, she reverts to her starting point. Therefore, a way the participant can break the circularity is by considering the name's communication chain and attributing a referential role to it, *contra* what DT admits.

5.1. Against the first and second argument

Ding and Liu's first argument is that several descriptions that according to DT fix the referent of names denote entities that speakers never saw or perceived: "For example, descriptivists often associate 'the highest mountain in the world' with Mount Everest, even though they have never seen it, nor walked around the world measuring the height of each mountain. [...] People have limited time and experience in their life" (p. 298). Ding and Liu emphasize that relatively few speakers directly saw Mount Everest. Those people formed some beliefs about it, with the most important one being that it is the world's highest mountain. Consequently, the speakers who did not see the mountain "learn about Mount Everest from others", when they listen to the name "Mount Everest" (p. 298). However, Ding and Liu continue, the fact that those speakers can form the belief that "Mount Everest is the highest mountain in the world" only by virtue of the above communication chain is not what philosophers have traditionally considered as the "critical disproof against the descriptive theory". Otherwise, "it would be unnecessary to construct so many thought experiments", like the Gödel one (p. 298). Analogously, the fact that John and his fellows form their belief that "Gödel is the discoverer of the incompleteness theorem" by virtue of a communication chain tracing back to the people who directly perceived Gödel is not a solid rationale to reject that "Gödel" refers descriptively.

The above defense is uncompelling. It is beyond any doubt that we learn names (and any word) from others by virtue of communication chains.[20] However, the problem at hand lies in the role that the theorist assigns to those chains. Ding and Liu fail to spot a crucial difference between a description like "The highest mountain in the world" and D2.

"The highest mountain in the world" expresses a property that is about the extra-mental reality, pertaining to mountains and their height. Mount Everest satisfies the above description with no need to assume that anyone's belief involving "Mount Everest" gets its object determined by the name's causal-historical chain. From a descriptivist point of view, people's uses of "Mount Everest" refer to that mountain and their beliefs are about it simply by virtue of Mount Everest's physical property of being the world's highest mountain.

D2 is crucially different. The description "The person who is widely believed to have discovered the incompleteness of arithmetic" appeals to a mental entity, namely John and his fellows' belief that "Gödel is the discoverer of the incompleteness theorem". As discussed, this belief is about the thief only under the assumption that the referent of the name "Gödel" appearing therein is fixed by its causal-historical chain. Problematically, if DT is true, causal-historical chains play no referential role and therefore cannot determine either the name's referent or, by extension, the belief's object.[21]

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[20] Martí (2020, p. 358) emphasizes the point very clearly: "[...] the existence of chains of communication is not specific to names. The use of *any* expression in the language is transmitted and propagated from link to link, from generation to generation of speakers as if through a chain. [...] I use the word 'here' or the word 'tiger' because I have learned and acquired those words from a competent speaker that has passed on to me the capacity to use them and thereby refer to the place where I am located, or to the feline species. This is a fact about how we learn language, how we typically incorporate words to our vocabulary, not a semantic fact" (emphasis in the original; see also Martí, 2022, p. 243).

[21] In a broad sense, one may claim that, also according to DT, chains have a referential role, in that they transfer the name and the associated description, enabling the speaker to refer when using the name.

Note that the problem with D2 is not the fact, *per se*, that it resorts to a mental entity; the problem is that D2 resorts to a mental entity that, in turn, relies on D2 itself. In other words, a reference-fixing description resorting to a mental entity does not necessarily entail circular reasoning. Let us suppose that there is a theater show featuring only two actors, and that during the show the spectators form the belief that one of the actors is excelling while the other is underperforming. That information is all that we —as external observers not present at the show— know about the actors. Let us now suppose that we wish to utter some statement about the actor whom the spectators regard as good. To do that, we choose to introduce the descriptive name "Carl", whose reference-fixing description is "The actor whom the spectators believe to be performing well", and —for instance— we utter: "Carl must have practiced thoroughly to impress the audience so much". The above description determines the referent for "Carl" by resorting to a mental state, namely the belief that the spectators have as to who the good actor is. However, crucially, it is possible to identify the object of that belief without coming back to the reference-fixing description: the spectators are directly looking at the two actors, have visual representations of them and identify only one of them as performing well. The availability of a visual, non-descriptive representation of the good actor determines that individual as the object of the spectators' belief, eliminating any need to revert to the initial reference-fixing description. As outsiders, we will be unable to visually identify who the widely appreciated actor is until, for example, we reach one of the spectators during the show and ask her to indicate that actor. If we never happen to interact with one of the spectators of the show, we will find ourselves forever incapable of recognizing the actor. That is beyond the point, though: what is crucial is that, thanks to the spectators' possession of a non-descriptive representation, the reference-fixing description for "Carl" ultimately leads to a referent without engendering any circularity.

The situation is different with D2, though. John and his fellows cannot have any non-descriptive representation of Gödel that would make that individual the object of their belief. As Vignolo and Domaneschi stress (2022, pp. 766-768), a person can have a non-descriptive representation of an entity if the person has or had a perceptual connection with that entity. While that happens with the public watching the theater show, that is not the case in the Gödel scenario, as John and his fellows lack any perceptual connection with Gödel: they are not seeing him, nor have they ever seen him and thus they cannot retrieve any memory of Gödel.[22] From a Kripkean point of view, another path is available:

However, in the descriptivist framework, chains ultimately play only a supporting role. Once a speaker X learns the name and the associated description, it is X's grasp of the description that determines X's ability to refer when using the name. In contrast, in the context of a Kripkean framework, when X learns a name from another speaker Y and thus enters into a specific chain of communication, it is that very inclusion in the chain, coupled with X's intention to use the name as Y does (Kripke, 1980, p. 96), that enables X to refer when using the name.

[22] Strictly speaking, the vignette does not state that John and his fellows have never seen Gödel (the thief). However, since the vignette says that the discovery of the incompleteness theorem is "the only thing they have ever heard about Gödel", it seems highly plausible that they have never seen Gödel or, even if they did, they did not form the belief that that individual was the discoverer of the incompleteness theorem. Otherwise, John and his fellows would associate some additional detail with the name "Gödel" (e.g., "The mathematician who gave a presentation at our school" or "The mathematician

John and his fellows can have a non-descriptive representation of Gödel because the name "Gödel" that they learn transfers a non-descriptive representation of the thief due to its historical connection with him. However, that is exactly what the descriptivist denies: according to DT, chains have no referential role. Therefore, while considering John and his fellows' belief that "Gödel is the discoverer of the incompleteness theorem", the only way a descriptivist participant can determine the belief's object is by resorting to the descriptive material that fixes the referent of "Gödel".[23] As argued, that descriptive material is D2, which engenders a circularity.[24]

These considerations provide the basis for presenting and countering also Ding and Liu's second argument for the compatibility between the reliance on the name's causal-historical chain and the purported descriptivist nature of option (a). They write that "Kripke is aware of D2 and discusses it when introducing the Gödel case in *Naming and Necessity*, but he refutes D2 because of his noncircularity condition, not the potential causal link in D2" (p. 298). Since Kripke does not point out its causal-historical link, that would not be the problematic aspect of D2.

Arguably, Kripke addresses only the circularity of D2 because that is the sole problem that can arise if DT is correct. A descriptivist cannot consider the object of the belief "Gödel is the discoverer of the incompleteness theorem" to be determined by the caus-

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portrayed in a famous photograph"), which would be relevant information that the vignette would likely mention.

[23] As mentioned, the criticism of circularity does not depend on the specific use of the verb "to believe": the same problem arises also with the verb "to attribute" (or to "acknowledge", "to recognize" or any other semantic nuance). Consider a reference-fixing description such as "The person who is widely attributed to have discovered the incompleteness of arithmetic". In order to determine whom that description denotes, a descriptivist needs to imagine how John or any other typical representative of the community would answer the question "To whom do you attribute the incompleteness theorem?". His answer would be "Gödel". At this point, a descriptivist needs to figure out the referent of "Gödel". She will resort to the reference-fixing description for that name in force within John's community, thus reintroducing the circularity. Also in this case, non-descriptive representations of the thief cannot make that individual the object of John and his fellows' attribution, thereby breaking the circularity, as John's community lacks such representations.

[24] One may object that, since the vignette states that "*most* people [...] are like John" (my emphasis), a participant may pragmatically infer that *not all* people are like him. Some strict group of speakers within John's community may possibly associate "Gödel" with additional descriptive or non-descriptive representations that would make the thief the object of this strict group's beliefs involving the name "Gödel" (on the possibility that different speakers or groups of speakers associate distinct descriptions with a name, see Machery *et al.*, 2013, p. 625; Machery, 2014, p. 10). Even granting that participants make such a pragmatic inference, the reference-fixing description D2 would still fail to denote any individual (if DT is the correct theory of reference). D2 regards the *widely* believed discoverer, namely the individual whom *most* people believe to be the discoverer of the theorem. For the reasons presented in the main text, the belief that "Gödel is the discoverer of the incompleteness theorem", as held by most speakers of John's linguistic community, fails to have any object: those speakers associate only D2 with the name and lack any additional descriptive or non-descriptive representation that could make the thief the object of their belief. By contrast, note that my theater example clearly presents a group of "privileged" people (i.e., the spectators), and the reference-fixing description for "Carl" explicitly mentions the belief that *those* people have ("The actor whom *the spectators* believe to be performing well").

al-historical chain of "Gödel". In that case, the chain would have a referential role, which is precisely what DT denies.[25]

5.2. Against the third argument

Ding and Liu's third argument is that "even though D2 involves causal connections, it is not likely to be the reason for the folk participants to choose D2 in our experiment". Indeed, the authors continue, "we do offer choice C indicating Gödel's real and original name is 'Gödel', which is an obvious and classic causal-historical chain in Kripke's sense. It is unlikely that Kripkean participants overlook the obvious causal chain but choose a potential one" (p. 298). Option (a), namely the social-description alternative, would attribute a role to the name's causal-historical chain only implicitly. Therefore, the participants who select (a) do not ground their choice on the name's causal-historical connection. Rather, they focus on the descriptive nature of the option. After all, whether or not D2 implicitly assigns any referential role to the name's causal-historical chain, D2 remains a description. Hence, the participants opting for (a) are likely to rely upon the fact that D2 is a description, "rather than detecting the potential causal connection [of D2] in one or two minutes" (p. 298). If the focus of these participants were the name's causal-historical chain, they would choose (c). Hence, (a) expresses a descriptivist intuition.

Also this defense is unconvincing. The fact that D2 is a description does not imply that (a) expresses a descriptivist intuition. The discriminating factor is the logical entailment that underlies the participant's choice of (a). The option states that John talks about Gödel "because he is widely believed to have discovered the theorem". The widely held belief within John's linguistic community is that "Gödel is the discoverer of the incompleteness theorem". As argued, that belief is about the thief only if the occurrence of "Gödel" therein functions causally-historically. Hence, the logical entailment enabling D2 to denote the thief is as follows. The name "Gödel" refers causally-historically; therefore, the widely held belief within John's community has the thief as its object; hence, D2 picks out the thief. Crucially, a participant can take D2 to denote the thief only if she accepts that "Gödel" functions causally-historically in the first place. The satisfactory relation between Gödel and D2 is thus a corollary of the causal-historical functioning of "Gödel". Hence, whatever

[25] The above arguments do not intend to deny that the reference-fixing description D1 "The person who actually discovered the incompleteness of arithmetic" is devoid of potential problems, distinct from the circularity issue. For example, one could argue that the exact meaning of "being the discoverer of a theorem" may be a matter of dispute (which would be a problem for D2 as well). Let us consider the Newton-Leibniz controversy over the discovery of the infinitesimal calculus: several historians of science prefer to move beyond a pure chronological criterion (based on who arrived at the result earlier). Given the conceptual specifics of the methods that the two authors employed, historians tend to consider both Newton and Leibniz as the discoverers of the infinitesimal calculus, or —even from a broader perspective— as significant contributors, among others, to a process that finally led to "the calculus as we know it today" (Guicciardini, 2017). However, in the context of the Gödel Case, as the vignette presents it, the description "The discoverer of the incompleteness theorem" seems to raise no issue of that kind. One individual —Schmidt— clearly is the discoverer of the incompleteness theorem, while another individual —Gödel— unquestionably commits a blatant act of wrongdoing, by appropriating Schmidt's result.

reason several participants have for preferring (a) to (c), the choice of (a) does not express a descriptivist answer or "a hybrid attitude of Kripkean and descriptivists" (p. 297). It is a purely causal-historical answer.[26]

6. Conclusion

In their valuable and thought-provoking contribution, Ding and Liu (2022) maintain that the description "The discoverer of the incompleteness theorem", which according to DT fixes the reference of "Gödel" in the Gödel Case, is ambiguous. One interpretation focuses on the brute facts, the other on the social facts. Ding and Liu contend that MMNS overlook the latter and therefore mistakenly classify the answers of the descriptivist participants who adopt the social interpretation as causal-historical. To corroborate that thesis, the authors conduct a series of experiments. In this paper, I have argued that, even granting Ding and Liu some argumentative points such as the reliability of referential intuitions or the authors' intended interpretation of the final prompt's options, their study fails to provide the intended evidence. Despite the authors' attempted rejoinders, their use of the social-fact description, namely D2, is unconvincing. If DT is the correct theory of names, D2 is circular and establishes no referent; that description picks out a referent only under the assumption that CHT is the correct theory of reference. Hence, in contrast to Ding and Liu's interpretation, from their premises, the authors can only conclude that their main experiment's results do not bolster MMNS's challenge against Kripke's refutation of DT, but rather diminish it.

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[26] The circumstance that D2 can select the thief only under the assumption that CHT is the correct theory seems to reflect a similar assumption underlying MMNS's vignette, which Ding and Liu adapted from Machery *et al.*'s (2010) traditional Chinese version into simplified Chinese. The vignette says that "John [...] can give an accurate statement of the incompleteness theorem, which he attributes to Gödel as the discoverer": as discussed, the narrator uses "Gödel" to talk about the thief; therefore, when the narrator states that John "attributes [the theorem] to Gödel", she claims that the thief is the object of that attribution. However, if DT is true, that is exactly what John cannot do: if the description that fixes the name's referent is D1, John attributes the theorem to the real discoverer; if the description is D2, he attributes the theorem to no individual, due to the discussed circularity. The formulation is consistent with DT only if one takes the narrator to describe John's *de dicto* attribution, namely, how John would verbally express himself (John would utter "I attribute the theorem to Gödel"). A more neutral formulation for the vignette could be "John attributes the theorem to a man whom he calls 'Gödel'". Devitt (2023, pp. 1149-1150) raises criticisms of the same kind against the vignettes of Li's (2023a) Study 1 (but analogous considerations extend to the vignettes of the other studies in Li, 2023a). For further critical reflections on the consistency of MMNS's vignette with DT, see Devitt (2012, pp. 27-28; 2015, pp. 46-47) and Devitt and Porot (2018, p. 1562).

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