

Definite descriptions and the alleged east–west variation in judgments about reference

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Abstract Machery et al. (2004) presented data suggesting the existence of cross-cultural variation in judgments about the reference of proper names. In this paper, we examine a previously overlooked confound in the subsequent studies that attempt to replicate the results of Machery et al. (2004) using East Asian languages. Machery et al. (2010, 2015) and Sytsma et al. (2015) claim that they have successfully replicated the original finding with probes written in Chinese and Japanese, respectively. These studies, however, crucially rely on uses of articleless, ‘bare noun phrases’ in Chinese and Japanese, which according to the linguistic literature are known to be multiply ambiguous. We argue that it becomes questionable whether the extant studies using East Asian languages revealed genuine cross-cultural variation when the probes are reevaluated based on a proper linguistic understanding of Chinese and Japanese bare noun phrases and English definite descriptions. We also present two experiments on native Japanese speakers that controlled the use of ambiguous bare noun phrases, the results of which suggest that the judgments of Japanese speakers concerning the reference of proper names may not diverge from those of English speakers.

Keywords Experimental philosophy · Cross-cultural semantics · Proper names · Definite descriptions · Articleless noun phrases

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1 Introduction

It is commonly assumed that philosophers of language (along with linguists working on the semantics and pragmatics of natural languages) appeal to their judgments about linguistic expressions in defending or criticizing particular theses about language. Machery et al. (2004) question the legitimacy of the use of these judgments on the grounds that there may be variation in them between Westerners and East Asians. More specifically, Machery et al. (2004) make a case for two claims: first, that they have found evidence showing that Westerners and East Asians have substantially different judgments about the reference of proper names, and second, that these differences have far-reaching implications for the methodology of the philosophy of language.

Both claims have attracted a fair amount of criticism. Many philosophers doubt that the methodological implications follow from Machery et al.'s experimental results even granted that they are legitimate and robust.¹ The focus of this paper is, however, exclusively on the first claim that the study conducted by Machery et al. (2004) provides evidence for genuine cross-cultural variation in semantic judgments about proper names. Accordingly, we will not discuss the possible existence of *intra*-cultural variation in semantic judgments (e.g., Machery et al. 2009; Machery 2012) and the possible challenges inter- or intra-cultural variation may pose to the traditional methodology in the philosophy of language (e.g., Machery 2014).

Machery et al.'s alleged evidence for the existence of the cross-cultural variation has also been scrutinized on many different fronts. Theorists suspect that Machery et al.'s study included experimental confounds or implicit factors that inadvertently influenced the responses of the participants. The possible confounds that have been pointed out in the literature include: the distinction between speaker's and semantic reference (Ludwig 2007; Deutsch 2009), the distinction between linguistic and metalinguistic intuitions (Martí 2009; Devitt 2011), the distinction between the perspective of the narrator (or the reader) and the perspective of the character in the vignette (Sytsma and Livengood 2011), the use of English probes rather than probes written in native languages (Lam 2010), and the unintended effects of the factive verb *learn* (Beebe and Undercoffer 2016).²

Machery and other experimental philosophers (Machery et al. 2009, 2010, 2015; Sytsma et al. 2015; Beebe and Undercoffer 2016) have addressed the concerns arising from these possible confounds and arguably shown that the reported cross-cultural variation remains even when these factors are controlled. In particular, in response to Lam's (2010) criticism that the original study was conducted

¹ For example, see Deutsch (2009, 2010, 2015), Devitt (2011), Ichikawa et al. (2012), Martí (2009, 2012) for theoretical defenses of the traditional methodology, and see Machery (2011, 2014), Machery and Stich (2012), Machery et al. (2013) for responses and further philosophical discussions.

² Adopting the notational conventions in the linguistics literature, besides emphasized words, we write object-language expressions in italics. Single quotation marks are used to refer to expressions and also to introduce the meaning of an object-language expression (e.g., *inu* 'dog'). Occasionally, when no confusion arises, we refer to Japanese expressions using English expressions flanked by single quotation marks in order to save space.

exclusively using English rather than a native East Asian language, Machery et al. (2010) and Sytsma et al. (2015) claim that they have successfully replicated the original finding with probes written in Chinese and Japanese, respectively.

In the original and subsequent studies, however, there is a yet another possible confound that may have influenced the outcomes of the experiments. The crucial factor that has been overlooked in previous research is that a great number of the world's languages, including Chinese and Japanese, are articleless languages that have no overt counterpart of the definite article *the* in English, while the probes used by Machery et al. (2004) essentially rely on definite descriptions, expressions of the form *the F*. The Chinese and Japanese probes used by Machery et al. (2010) and Sytsma et al. (2015) contain so-called articleless, 'bare' noun phrases, which they assume to be strictly analogous to the definite descriptions used in the original English probes. In the linguistics literature, however, bare noun phrases are known to be multiply ambiguous (Chierchia 1998; Cheng and Sybesma 1999; Izumi 2011, 2012), and they may have distorted the responses of the Chinese or Japanese speaker participants. Let us call this possible confound the 'noun phrase ambiguity'.

In what follows, we will argue that it becomes questionable whether the previous studies revealed genuine cross-cultural variation given the linguistic differences between English definite descriptions and Chinese and Japanese bare noun phrases. We will also report two experiments on native Japanese speakers in which the alleged cross-cultural variation disappeared when the noun phrase ambiguity was removed by using Japanese phrases that are more analogous to English definite descriptions than simple bare noun phrases.

The rest of this paper is organized as follows: Sect. 2 introduces the basic characteristics of Chinese and Japanese bare noun phrases; Sect. 3 discusses a major problem arising from the noun phrase ambiguity in the extant studies that attempted to replicate Machery et al.'s (2004) original finding using an East Asian language (Machery et al. 2010; Sytsma et al. 2015); Sect. 4 presents two experimental studies that evaluate the effects of the noun phrase ambiguity, suggesting that native Japanese speakers have semantic judgments about proper names that may be comparable to those of native English speakers; and Sect. 5 concludes the paper by revisiting the original study in Machery et al. (2004) in light of this new discovery.

2 Articleless bare noun phrases

Articleless, bare noun phrases in languages such as Chinese and Japanese can have a variety of interpretations primarily depending on the choice of predicate and the context of use. As shown in the Japanese examples (1–4) below, sentences that contain a bare noun phrase (e.g., *inu* 'dog') generally yield four different types of interpretations. First, a discourse-initial use of (1) makes an existential claim involving some or other dog or some or other group of dogs; it can assert the existence of more than one dog, because Japanese (as well as Chinese) nouns are typically number-neutral in the sense that there is no morphological singular-plural distinction, and they are compatible with both singular and plural interpretations.

Second, the same bare noun in (2) can be used to refer to a particular, contextually salient dog (or a group of dogs). One interpretation available to (2) is that it is a claim about the dog that has already been mentioned in discourse; adding a relative clause like *sakki hoeteita* ('that was barking earlier') would help identify which dog the speaker has in mind (again, a plural reading is also available). Third, (3) is clearly concerned with the whole canine species, not merely with some or other dogs, and fourth, (4) attributes a specific property to the vast majority of dogs.

- (1) **Inu-ga** hoeta.
 dog-NOM barked
 "A dog/dogs barked." (Indefinite)
- (2) (Sakki hoeteita) **inu-ga** bar-ni haittekita.
 earlier barking.was dog-NOM bar-to entered.
 "The dog/dogs that was/were barking earlier entered the bar." (Definite)
- (3) **Inu-ga** zetumetusita.
 dog-NOM extinct.became
 "Dogs went extinct." (Kind or species)
- (4) **Inu-ga** hoeru no-wa atarimae-da.
 dog-NOM bark COMP-TOP obvious-be
 "It's obvious that dogs bark." (Generic)

(1–2) together show that Japanese bare noun phrases can play the roles similar to 'indefinite' and 'definite' descriptions in English, while (3–4) further show that they are also comparable to plural count nouns and mass terms in English, such as *dogs* and *water*, which often yield 'kind or species' and 'generic' interpretations. Mandarin and Cantonese Chinese are also known to exhibit the same interpretive variability (Cheng and Sybesma 1999).

It is true that the predicate taking a bare noun phrase as an argument often limits the range of possible interpretations available to that noun phrase. For example, the predicate '*x* entered the bar' in (2) would be incompatible with a kind or species interpretation (it is hard to imagine a circumstance in which a whole animal species enters any one place). There are predicates, however, that are compatible with all four interpretations. Consider 'John is talking about *x*'. This predicate is, of course, compatible with a definite and an indefinite interpretation of a bare noun (as well as with English definite and indefinite descriptions). Furthermore, as the following Japanese and English sentences suggest, the predicate is clearly compatible with a kind or species and a generic interpretation.

- (5) a. John-wa tora nituite hanasiteiru.
 John-TOP tiger about is.talking.
 John-wa tora-ga 2020 nen madeni
 John-TOP tiger-NOM 2020 year by
 zetumetusuru to syuchositeiru.
 become.extinct.nonpast that claims.
 “John is talking about tigers. He claims that they will become extinct by 2020.” (Kind or species)
- b. John-wa tora nituite hanasiteiru.
 John-TOP tiger about is.talking.
 John-wa tora-ga zassyoku dewa nai to
 John-TOP tiger-NOM omnivore be not that
 syuchositeiru.
 claims.
 “John is talking about tigers. He claims that they aren’t omnivores.”
 (Generic)

Two observations about bare noun phrases must be noted here: first, they can yield four different types of interpretations (the indefinite, definite, kind or species, and generic interpretations), and second, the predicate ‘John is talking about *x*’ is compatible with all of them. These two observations pose a challenge to previous research involving East Asian languages.

3 Bare noun phrases in experimental philosophy

In this section, first, we outline the past experimental studies that tested the semantic judgments of East Asians using bare noun phrases. Second, we argue that these studies have a problem arising from the multiple interpretive possibilities of bare noun phrases introduced in the last section (the noun phrase ambiguity).

In Machery et al.’s (2004) original probes, the questions asked were formulated using English definite descriptions. Consider the probe inspired by Kripke’s (1980) Gödel case, which ends with the disjunctive question containing two definite descriptions (6).

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.

- (6) When John uses the name ‘Gödel’, is he talking about:
 (A) *the person* who really discovered the incompleteness of arithmetic? or
 (B) *the person* who got hold of the manuscript and claimed credit for the work?
 (Machery et al. 2004, B6, emphasis and example number added).

Machery et al. (2004) developed this and other vignettes in order to compare the judgments of Westerners and East Asians concerning the reference of proper names. According to Machery et al., philosophers of language with a traditional bent believe that their inclinations to choose (6B) provide evidence for the ‘causal-historical view’ of the reference of proper names, and that, on the flip side, choosing (6A) would have supported the opposing ‘descriptivist view’. Machery et al. claim that, if the judgments of the traditional philosophers are not shared by East Asians, the traditionalists would lose an important piece of evidence for the causal-historical view of names. Furthermore, Machery et al. suggest, such a finding would by extension challenge the legitimacy of the use of judgments on which philosophers of language, arguably, have based their arguments for particular theses.³

The results reported in Machery et al. (2004) indeed indicate that there is substantial variation between Westerners and East Asians with respect to their judgments about the reference of proper names. Whereas 56.5% of the American participants selected the (B)-type answers, only 31.5% of the Hong Kong participants did so—a majority of the East Asian participants chose the answers more compatible with the descriptivist view of names.⁴

One concern about this outcome raised by Lam (2010) is that this study exclusively used English to test the semantic judgments of the East Asian participants whose first language was likely to be Cantonese. It is possible that the ways in which the native Cantonese speakers understood the probes written in English were not exactly analogous to the ways in which the American participants understood them. Addressing this concern, Machery et al. (2010, 362) report that they successfully replicated the original results using the Chinese translation of the Gödel probe cited above. Likewise, in one of their studies, Sytsma et al. (2015, 220)

³ In this paper, we do not question the validity of Machery et al.’s reasoning here. Our focus is on the claim that there is variation in semantic judgments between Westerners and East Asians, regardless of its implications. It has been contended, however, that the traditional philosophers do not really rely on a methodological assumption that would be undermined by such findings. See Machery (2012) for a formulation of the allegedly problematic practice, the ‘method of cases’, and Deutsch (2015) for the argument that traditional philosophy is not dependent on the method, as well as Colaço and Machery (2016) for a critical discussion of Deutsch’s argument.

⁴ Since the original work used a different scale, the percentage figures here are adapted from Sytsma et al. (2015, 216).

used the Japanese translation of the original Gödel probe and obtained the same discrepancy between Japanese and Western participants.

These replication studies, however, fall short of providing support for the alleged cross-cultural variation due to the noun phrase ambiguity. The inquisitive part of the Chinese translation employed by Machery et al. (2010, 365) was formulated using ambiguous bare noun phrases. Sytsma et al. (2015, 227) also presented to the participants a question in Japanese containing ambiguous bare noun phrases. The bare noun phrases used in these Chinese and Japanese probes look something like the following:

- (7) When John uses the name ‘Gödel’, is he talking about:
 (A) *person* who really discovered the incompleteness of arithmetic?
 or
 (B) *person* who got hold of the manuscript and claimed credit for the work?

We have seen in the previous section that bare noun phrases can have four types of interpretations, and that the predicate ‘John is talking about x ’ in itself excludes none of them. From these basic characteristics of bare noun phrases, it immediately follows that, since the bare noun phrases represented by (7A) and (7B) are ambiguous, at least not in the same way as the original definite descriptions, (6A) and (6B), it would be unjustifiable to assume that the bare noun phrase translations of (6A) and (6B) generate the same effect as (6A) and (6B); since they are essentially different types of expressions, if they are assumed to cause the same effects, a good reason must be provided, but the previous research provides no such reason. Thus, it would be unjustifiable to assume that the probes given to the East Asian participants in Machery et al. (2010) and Sytsma et al. (2015) ask the same questions as the probes given to the Western participants. Therefore, it becomes dubious that the responses of the East Asian participants support the existence of cross-cultural variation.

These authors might respond that, among the different types of interpretations available to the bare noun phrase translations of (6A) and (6B), the participants zoned in on the single type of interpretation that the authors intended. (6A) and (6B) were intended as anaphorically used singular definite descriptions, the functions of which are to point back to some entity that has been already introduced into discourse (Hawkins 1978). That is, (6A) and (6B) were intended to designate uniquely a particular individual who is described in the vignette, Schmidt and Gödel, respectively. As long as the East Asian translations of (6A) and (6B) can have the intended interpretations, the overall vignette might provide enough contextual information that allowed the participants to eliminate the other irrelevant interpretations.

The vignette, however, fails to provide enough contextual information to eliminate all the unwanted readings. Besides the anaphoric, definite uses intended by the authors, the bare noun phrase translations of (6A) and (6B) can have what we might call the ‘indefinite narrow scope’ interpretation. This interpretation is analogous to the narrow scope reading of (8), in which the indefinite description *a perpetual motion machine* interacts with the verb phrase *talk about* in terms of scope.

(8) John is talking about a perpetual motion machine.

(8) has a narrow scope reading according to which the subject, John, is talking about something as having the property of being a perpetual motion machine. Although there exist no such machines, one can truly utter (8) with this narrow scope reading. For the speaker would be just reporting some part of John’s speech, according to which there is a perpetual motion machine.

On the wide scope reading of (8), on the other hand, John does not have to be aware that the object he is talking about is a perpetual motion machine: ‘there is a perpetual motion machine such that John is talking about it’. The crucial difference between the narrow and wide scope readings of (8) for present purposes is that, in the former reading, the subject would have to have in mind the property of being a perpetual motion machine.

The bare noun phrase translations of (6A) and (6B) have the indefinite narrow scope reading, analogous to the narrow scope reading of (8). This is fully expected given the basic characteristics of bare noun phrases discussed in the previous section. A bare noun phrase can have an indefinite, existential interpretation, playing the same role as an indefinite description in English, and the translation of *talk about* embeds a bare noun phrase in (7), just as *talk about* embeds an indefinite description in (8).

In other words, the Japanese (or Chinese) probe question represented by (7) can be interpreted as asking the following, where *some*-phrases are understood as taking narrow scope with respect to *talk about*:

- (9) When John uses the name ‘Gödel’, is he talking about:
 (A) some person(s) who really discovered the incompleteness of arithmetic? or
 (B) some person(s) who got hold of the manuscript and claimed credit for the work?

There is good reason to take (9A) to be the right answer. According to the vignette, John only knows that there is a person called ‘Gödel’, who he thinks to have discovered the incompleteness of arithmetic; he has no knowledge of Gödel’s actual deeds such as stealing Schmidt’s manuscript. While using the name *Gödel* or any other expression for that matter, John can have in mind the property of being a person who discovered the incompleteness of arithmetic, but John is highly unlikely to entertain any property that remotely resembles ‘being a person who got hold of

the manuscript and claimed credit for the work'. It is irrelevant whether *Gödel* is a Millian name referring to Gödel or a description in disguise designating Schmidt. (9A) and (9B) are describing John's speech and his thinking behind it, and it seems wrong to choose (9B) and attribute to John any thought about someone who got hold of the manuscript and claimed credit for the incompleteness theorem. Thus, there is reason for the East Asian participants to choose the (A) answer if (9) reflects their understandings of the probe question.

Besides the definite and indefinite interpretations, the bare noun phrase translations of (6A) and (6B) might also be compatible with the kind or species interpretation. The comparable English question would be something like the following:

- (10) When John uses the name 'Gödel', is he talking about:
 (A) the kind of people who really discovered the incompleteness of arithmetic? or
 (B) the kind of people who got hold of the manuscript and claimed credit for the work?

There is a sense in which John is indeed talking about a particular type or kind of people: people who could discover the incompleteness of arithmetic. Again, (10A) would be the right answer given the scenario, because the characteristics of the type of people stated by (10B) are unlikely to come before his mind. Whether *Gödel* refers to Gödel or designates Schmidt is a completely independent issue. Whatever meaning *Gödel* might have, (10A) is compatible with the scenario, whereas (10B) is not. Thus, again, there is reason for the East Asian participants to choose the (A) answer over the (B) answer if (10) captures their understandings of the probe question.

Overall, the bare noun phrases used in previous studies seem to have three different interpretations that are compatible with the vignette: the anaphoric singular definite, the indefinite narrow scope, and the kind or species interpretation. It is difficult to tell whether the participants really entertained the third, kind or species interpretation during the experiments, but at the same time, there is no theoretical reason to exclude it. We leave it open whether the participants entertained the kind or species interpretation. We do not have to be committed to the availability of the kind or species interpretation of the bare noun phrases; the indefinite narrow scope interpretation sufficiently distinguishes them from the original definite descriptions in English. This difference shows that the bare noun phrases used in previous studies are different types of expressions from the original definite descriptions.

The original descriptions (6A) and (6B) are ambiguous in their own way due to their scope properties.⁵ If they take scope over *talk about*, the subject, John, does not have to be aware that the object he talks about satisfies the descriptive contents of

⁵ Or English definite descriptions only have apparent scope properties and are always interpreted *in situ*, but the syntactically represented variables inside definite descriptions can create multiple readings (Elbourne 2013). (6A) and (6B) are still predicted to be ambiguous on the non-quantificational, presuppositional account of definite descriptions.

(6A) and (6B). Since the vignette indicates that John is very unlikely to entertain the description (6B), the authors intended the wide scope interpretation. To put the point differently, the authors intended to use (6A) and (6B) anaphorically to refer to Schmidt and Gödel, regardless of whether John thinks of Schmidt or Gödel under any particular description.

If (6A) and (6B) take narrow scope below *talk about*, John must be aware of the properties stated by the descriptions. For example, (6A) under the narrow scope reading means that, according to John's speech, there is exactly one person who discovered the incompleteness theorem. If the authors intended this narrow scope interpretation, then they would be using (6A) and (6B) attributively, not referring to particular individuals.⁶ Notice that the narrow scope interpretation of definite descriptions is similar to but different from the indefinite narrow scope interpretation of bare noun phrases: the bare noun phrase translations of (6A) and (6B) have no uniqueness implication, and they are compatible with more than one person who satisfies the descriptive content.

To summarize, the bare noun phrases in previous research, represented by (7A) and (7B) above, are at least two-ways ambiguous, and possibly three-ways ambiguous: they are ambiguous between the anaphoric singular definite interpretation and the indefinite narrow scope interpretation, or they are ambiguous between the anaphoric singular definite interpretation, the indefinite narrow scope interpretation, and the kind or species interpretation. Either way, the English definite descriptions used in the original study are not ambiguous in the same way (though they are ambiguous in a different way). Thus, it would be unjustifiable to assume that these definite descriptions and bare noun phrases gave the same questions to the Western and East Asian participants. Furthermore, the alleged 'descriptivist' (A) answer would be more compatible with the vignette when the bare noun phrases are assigned the indefinite narrow scope or the kind or species interpretation, regardless of the semantic content of *Gödel*.

4 Two experiments with Japanese definite phrases

The main lesson to be drawn from the discussion thus far is that one must exercise caution when translating experimental probes originally written in English into a different language for the purposes of cross-cultural comparison. Accordingly, in order to determine whether Machery et al.'s (2004) original finding can be replicated using appropriately produced probes in an East Asian language, we conducted two experiments on Japanese speakers that excluded simple bare noun phrases in translating the original question (6).⁷

⁶ Whether this ambiguity relates to the intra-culture variation reported by Machery and his colleagues is a question we do not pursue here (recall that only roughly a half of the Western participants selected (B) answers in their original study).

⁷ In one study, Lam (2010) also removed the noun phrase ambiguity by using proper names and found no significant variation between Westerners and East Asians. The use of proper names in this study, however, was criticized by Machery et al. (2010).

4.1 Experiment 1

In the first experiment, we revised the bare noun phrases in previous research, represented by (7A) and (7B), so that they would be more likely to have the interpretations that were originally intended by Machery et al. (2004). The definite descriptions in the original studies, (6A) and (6B), are anaphorically used singular definite descriptions. That is, they uniquely designate Schmidt and Gödel, who are introduced in the vignette. Two changes were made to Sytsma et al.'s (2015) Japanese translations of (6A) and (6B) as an attempt to realize these anaphoric definite interpretations.

First, we used the so-called ‘intermediate’ demonstrative *sono*-phrases, definite phrases in Japanese, which have some characteristics in common with definite descriptions in English.⁸ Importantly, just as English definite descriptions (as well as complex demonstratives), *sono*-phrases do not have an indefinite, existential interpretation, as is shown by the contrast between (11a) and (11b).

- (11) a. watasi-wa kamino nagai seito ni atta.
 I-TOP hair long student DAT met.
 “I met a/the/some student(s) with long hair.”
- b. watasi-wa **sono** kamino nagai seito ni atta.
 I-TOP **sono** hair long student DAT met.
 “I met the/that/those student(s) with long hair.”

(11a) contains the bare phrase *kamino nagai seito* (literally, ‘hair long student’), and it is compatible with an indefinite, existential interpretation: ‘There is at least one student with long hair whom I met’. This interpretation is not available to (11b), where the direct object is modified by the *sono*-demonstrative.

Furthermore, just as English definite descriptions, *sono*-phrases have an anaphoric use: they can be used to refer to what has been mentioned earlier (Hoji et al. 2003). A *sono*-phrase could also refer to an unmentioned object that is salient in discourse, however. Accordingly, to ensure that the participants seek an individual mentioned in the vignette, Gödel or Schmidt, we added the predicate suggesting anaphoricity ‘appeared in the text’ to the previous Japanese translations together with *sono*.⁹

Japanese *sono*-phrases are, however, not semantically and pragmatically equivalent to English singular definite descriptions (nor to singular complex demonstratives) for at least two reasons. First, as the accompanying interpretation of (11b) indicates, *sono* is compatible with a plural interpretation of the noun. Second, *sono*-phrases have some kind of discourse-related requirement that is not necessary

⁸ In modern Japanese, there are three different types of demonstratives: the *ko*-, *so*-, and *a*- series. The proximate and distant demonstrative expressions *ko*- and *a*- roughly correspond to *this* and *that*, respectively, while the intermediate *so*- is often associated with the definite article *the* (Hoji et al. 2003).

⁹ In addition to an anaphoric reading, a *sono*-phrase has a deictic reading, just like English complex demonstratives. In the current experimental settings, however, there is no demonstration by a speaker, and so a deictic interpretation can be easily excluded.

for the use of English definite descriptions. According to one characterization of the requirement, “the anaphoric *so*-series is used for referring to something that is not known personally to either the speaker or the hearer or has not been a shared experience between them” (Kuno 1973, 288). Thus, it must be noted that the first change does not ensure that the revised phrases are semantically and pragmatically equivalent to the original definite descriptions.

The second change we made to the previous Japanese translations of (6A) and (6B) is to add more content to the descriptions that would make the anaphoric definite interpretations more prominent and the other interpretations less plausible. Drawing on (Machery et al. 2009; Sytsma and Livengood 2011) we added to the previous translations the predicates ‘being unknown to John’ and ‘being widely believed to have discovered the incompleteness of arithmetic’, respectively, to highlight the intended interpretations of the phrases. It would be more difficult to interpret, for example, the phrase corresponding to (7A) together with ‘being unknown to John’ to have the indefinite narrow scope interpretation, because that would imply that John’s speech describes his own ignorance of the identity of the discoverer of the incompleteness theorem. Since John takes Gödel to have proven the theorem and speaks as if he knows who discovered the theorem, his speech would not explicitly state such ignorance.¹⁰

Putting these two changes together, the revised Japanese probe question asked in this experiment was the following (see Appendix for the entire probe):

(12) (In Japanese) ‘When John uses the name ‘Gödel’, is he talking about’:

- | | | | | |
|--|--|--|--|--|
| (A) | Bunchu-ni
text-in
sanjutuno
arithmetic
hakkensita
discovered | detekita,
appeared,
fukanzensei-o
incompleteness-ACC
sono
the | John-ga
John-NOM
hontoni
really
jinbutu
person | siranai,
know.not, |
| “the person who (appeared in the text but unknown to John) really discovered the incompleteness of arithmetic” | | | | |
| (B) | Bunchu-ni
text-in
hakkensita
discovered
sinjirareteiru
believed
jissaiwa syukou-o
actually manuscript-ACC | detekita,
appeared,
jinbutu
person
ga,
but,
teniire
obtained | sanjutuno
arithmetic
to
as
kouseki-o
credit-ACC | fukanzensei-o
incompleteness-ACC
hiroku
widely
jibunmononisita
self.claimed |

¹⁰ See Sytsma and Livengood (2011, 321) for different ways of characterizing the roles of these added predicates. As with Sytsma and Livengood, we do not try to distinguish these different ways experimentally here.

sono jinbutu
the person
 “the person who is widely believed to have discovered the incompleteness of arithmetic, but actually got hold of the manuscript and claimed credit for it”

To compare this revised question (12) and the question used in Sytsma et al. (2015) that contains bare noun phrases, we conducted a randomized controlled trial in which these two questions were randomly assigned to a group of participants recruited at a Japanese university ($N = 211$; all Japanese speakers with native fluency; age range: 20–25; 32 female, 168 male, and 21 unanswered). Each participant was presented with the same Japanese translation of Machery et al.’s (2004) Gödel vignette, which was followed by either one of the two questions. To avoid any order effect, the answer options were also randomized.

The results of this experiment show that there is a significant difference between these two questions with and without bare noun phrases (Fig. 1). First, 30.6% ($N = 111$) of the participants in the original, bare noun phrase condition selected the ‘causal-historical’ (B) answer. This was very much in line with Sytsma et al.’s (2015) report, in which only 29.9% ($N = 67$ out of 221 participants) of the Japanese participants gave a causal-historical response. Second, 50% ($N = 110$) of the ‘without bare noun phrase’ condition selected the (B) answer. This difference in the proportions of giving (B) responses between the two randomly selected groups was contingent on the phrasings of the questions provided.¹¹

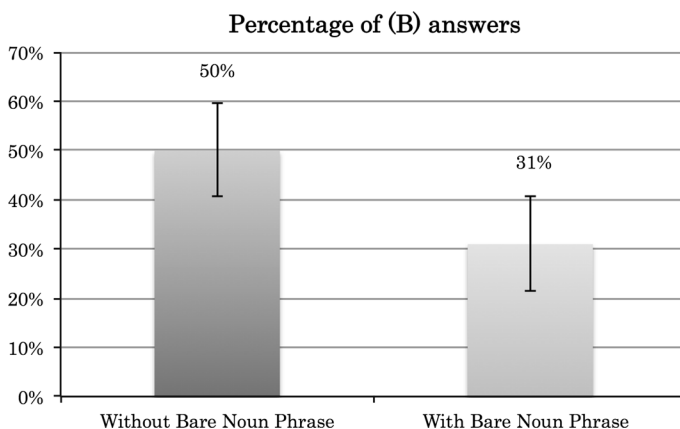


Fig. 1 Results of Experiment 1

¹¹ The 95% confidence intervals for the proportion of (B) answers for each condition are: With Bare Noun Phrase (0.227, 0.406) and Without Bare Noun Phrase (0.403, 0.596). That is, these two intervals do not substantially overlap with each other, indicating that the revised question created the difference.

To repeat the figures of the original study in Machery et al. (2004), 56.5% of the American participants selected the analogous (B) answer, as opposed to 31.5% of the Hong Kong participants. Thus, the proportion of the Japanese participants in the current study who gave a causal-historical response is in line with the proportion of the American participants who gave a causal-historical response in the original study. In other words, the results of Machery et al. (2004) were not replicated when a Japanese probe was carefully constructed to target at the intended interpretations of the original definite descriptions.

4.2 Experiment 2

Experiment 1 shows that the responses of Japanese speakers to the Gödel vignette are not clearly descriptivist if the probe question is constructed less ambiguously. It does not show, however, which of the two changes we made to the previous Japanese translations of (6A) and (6B) generated the observed effect. Experiment 2 was designed to understand further the functions of the two changes by decomposing them into five different conditions, where the base bare noun phrases were modified to a varying degree: (i) no extra modification was added (i.e., the ‘with bare noun phrase’ condition in Experiment 1), (ii) *sono*-demonstratives alone were added, (iii) *sono*-demonstratives and the anaphoric predicate ‘appeared in the text’ were added, (iv) the clarifying predicates (e.g., ‘unknown to John’) alone were added, (v) all of these phrases were added (i.e., the ‘without bare noun phrase’ condition in Experiment 1). To illustrate, the following schematically represents the (A) answer in each condition:

- (13) (i) With Bare Noun: ‘person who really discovered the incompleteness of arithmetic’
 (ii) *Sono* Alone: ‘the person who really discovered the incompleteness of arithmetic’
 (iii) *Sono* + Anaphoric: ‘the person who (appeared in the text) really discovered the incompleteness of arithmetic’
 (iv) Clarifying: ‘person who (unknown to John) really discovered the incompleteness of arithmetic’
 (v) Without Bare Noun: ‘the person who (appeared in the text but unknown to John) really discovered the incompleteness of arithmetic’

We conducted another randomized controlled trial with these five question probes in exactly the same way as Experiment 1 (N = 1062; all Japanese speakers at the same university with native fluency; age range: 18–65; age average 18.4; 254 female, 764 male, and 44 unanswered). The participants of Experiment 2 were recruited from different departments than Experiment 1 (also in a different academic year), and they were asked if they took Experiment 1; so it is very unlikely that there was an overlap between the participants of Experiments 1 and 2. The results are stated in the following: Figure 2 represents the proportion of

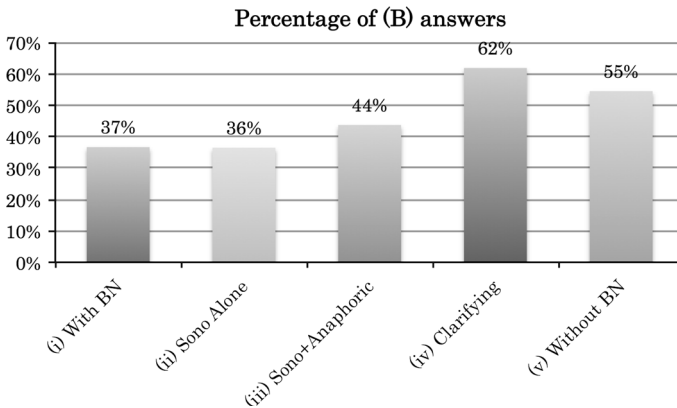


Fig. 2 Results of Experiment 2

(B) answers for each condition, and Table 1 shows the Fisher's Exact Test p values for all combinations of the conditions.¹²

There are four points to be made concerning the data obtained. First, as expected, the results of Experiment 1 were replicated with this large number of participants: only 37% ($N = 210$) of the participants who were randomly assigned to (i), the unmodified bare noun phrase condition, chose the (B) answer, whereas 55% ($N = 211$) of those assigned to (v), the clarified *sono*-phrases, chose the (B) answer.

Second, adding the clarifying predicates alone made the responses of the participants more in line with the 'causal-historical' view than any other conditions—62% ($N = 215$) chose the (B) answer. Although this outcome was unexpected, it is diametrically opposed to one of the results reported in Sytsma et al. (2015), where Sytsma and colleagues used a Japanese probe similar to (iv) and found that 41.2% ($N = 51$) of the participants selected (B) as their answers. The proportion of (B) answers we obtained is more analogous to their outcome concerning English speakers (68.5%, $N = 143$).

Given this sharp contrast, Sytsma et al.'s Japanese probe question deserves closer scrutiny. Let us compare the Japanese phrases they used and those in our condition (iv). Consider the (A) choice, which is reproduced here as (14b), together with Sytsma et al.'s English original (14a).

¹² The values were computed using R ver. 3.2.5. The 95% confidence intervals for the proportion of (B) answers for each condition are: (i) (0.281, 0.468), (ii) (0.272, 0.458), (iii) (0.346, 0.538), (iv) (0.522, 0.709), and (v) (0.452, 0.644). We also summarize the results of χ^2 test of independence as follows: (i vs ii: $\chi^2 = 0$, $df = 1$, $p = 1$); (i vs iii: $\chi^2 = 1.9149$, $df = 1$, $p = 0.1664$); (i vs iv: $\chi^2 = 25.977$, $df = 1$, $p = 3.454e - 07$); (i vs v: $\chi^2 = 12.787$, $df = 1$, $p = 0.000349$); (ii vs iii: $\chi^2 = 2.0244$, $df = 1$, $p = 0.1548$); (ii vs iv: $\chi^2 = 26.411$, $df = 1$, $p = 2.759e - 07$); (ii vs v: $\chi^2 = 13.082$, $df = 1$, $p = 0.0002981$); (iii vs iv: $\chi^2 = 13.475$, $df = 1$, $p = 0.0002418$); (iii vs v: $\chi^2 = 4.5311$, $df = 1$, $p = 0.03328$); (iv vs v: $\chi^2 = 2.0774$, $df = 1$, $p = 0.1495$).

(14)

- a. the person who (unbeknownst to John) really discovered the incompleteness of arithmetic
- b. sanjutuno fukanzensei-o hontoni hakkensita
 arithmetic incompleteness-ACC really discovered
 jinbutu (John-wa kono-koto-o
 person (John-TOP this-thing-ACC
 siranai)
 know.not)
 “person who really discovered the incompleteness of arithmetic (John doesn’t know this)”
 (Sytsma et al. 2015, 228)

Notice that (14b) is not quite structurally equivalent to the English description (14a). The predicate *unbeknownst to John* is embedded inside the definite description in (14a). Given the scenario, (14a) indicates that John does not know that the designated person discovered the theorem. On the other hand, the Japanese counterpart (14b) includes an independent clause in parentheses, which asserts that John does not know the proposition expressed by the newly introduced demonstrative phrase *kono koto* (‘this thing’). What does this phrase mean? Since the preceding noun is *jinbutu* (‘person’), and a person cannot be referred to using *koto* (‘thing’), the clause in the parentheses cannot simply mean ‘John doesn’t know the real discoverer of the incompleteness theorem’. It must refer to some or other proposition.

There are at least two possible interpretations of *kono koto* (‘this thing’) in this context. The first possible interpretation is that it refers to the proposition that the true discoverer of the theorem (someone other than Gödel) discovered the theorem. This interpretation would make (14a) and (14b) a matching pair: John *thinks* that Gödel proved the theorem but fails to know that somebody else did it—this appears to be what is intended by adding *unbeknownst to John* in (14a). If ‘this thing’ is interpreted in this way, then (14a) and (14b) would be analogous. This interpretation of (14b) is, however, hard to access because the participants would have to construct it on their own by analyzing the preceding noun phrase.¹³

The second, possibly more accessible interpretation of ‘this thing’ is that it simply refers to the proposition expressed by the entire sentential clause including the main question: ‘When John uses the name ‘Gödel’, is he talking about ...’. The choice (14b) and the preceding question together form the sentence ‘When John uses the name ‘Gödel’, he is talking about person who really discovered the incompleteness of arithmetic’, and *this* is what John does not know. That is, he fails to be aware of whom he is talking about. Whether (14b) supports the descriptivist or the causal-historical view of names, this interpretation makes the comparison between (14a) and (14b) inappropriate due to the lack of the analogous reading of (14a).

In contrast to Sytsma et al.’s (14b), the clarifying predicate we added, *John-ga siranai* (‘whom John doesn’t know’ or ‘being unknown to John’) in (12) above, is

¹³ Doing the same thing with the accompanying English translation of (14b) ‘person who really discovered the incompleteness of arithmetic (John doesn’t know this)’ seems also difficult.

Table 1 Fisher’s Exact Test p values for all combinations of (i–v)

	(ii) <i>Sono</i> Alone	(iii) <i>Sono</i> +Anaphoric	(iv) Clarifying	(v) Without BN
(i) With BN	1	0.1666	2.427e-07	0.0002879
(ii) <i>Sono</i> Alone		0.1388	1.623e-07	0.0002879
(iii) <i>Sono</i> +Anaphoric			0.0002334	0.0329
(iv) Clarifying				0.1407

embedded inside the bare noun phrase. The implication is that John does not know that the person in question discovered the theorem, and it reflects the intended meaning of (14a) more accurately than (14b) does.

Third, we found no evidence that the *sono*-demonstrative alone could make a difference from the basic bare noun phrases (ii, 36%, $N = 211$). When the anaphoric predicate ‘appeared in the text’ was added to *sono*, the number of (B) answers was slightly higher (iii, 44%, $N = 215$). The cause of this increase cannot be decisively attributed to the anaphoric predicate, however ($p = 0.1666$ for i vs iii; $p = 0.1388$ for ii vs iii).

Fourth, putting the two changes together (iii+iv=v) increased the number of (B) answers to a lesser extent than just adding the clarifying predicates (iv). Since the p value for conditions (iv) and (v) is less than 0.05 ($p = 0.1407$), however, the current study fails to show that there is a significant difference between these conditions.

Although it is difficult to interpret results with no significance, the lack of significant difference between (iv=62%) and (v=55%) betrayed our prediction that (v), being more comparable to the English probe question than (iv), would attract a higher proportion of the ‘causal-historical’ responses. One possible interpretation of the data is that 62% overestimates the true percentage of (iv) and the true proportion turns out to be somewhere around 55%.¹⁴ If this were the case, then one might take our study to fail to deny that there is cross-cultural variation.¹⁵ One might even contend that there is evidence for cross-cultural variation: Sytsma et al. (2015) examined the English counterpart of (iv) and found the 68.5% of native English speakers selected the (B) answer (their “Clarified narrator” case).

This objection presupposes that the Japanese and the English results are directly comparable. The proportional difference between the true percentage of (iv) and Sytsma et al.’s English results would not necessarily show the existence of cross-cultural variation precisely for the same reason that the difference reported in the Machery et al.’s (2004) original experiment does not show it. The Japanese phrase in condition (iv) is a bare noun phrase that is not analogous to the English description (14a). As we have discussed in Sect. 4.1, the added predicates were expected to make the irrelevant but possible interpretations less plausible. Nevertheless, it is still possible that the added predicates did not exclude all the other interpretations, due to the noun phrase ambiguity. Even if the true proportion of (B) answers in (iv) is close to

¹⁴ Another possibility is that 55% underestimates the B answers in (v). This may not be very plausible, however, because the same condition in Experiment 1 shows a similar proportion (50%).

¹⁵ We thank an anonymous reviewer for alerting us to this possibility.

55%, by showing there to be a significant difference between (i) and (iv) (as well as between (i) and (v)), we have established that bare noun phrases are ambiguous, and they can be made less ambiguous with clarification. There is no guarantee that the English probe containing definite descriptions and the Japanese translation of it containing bare noun phrases were interpreted in the exactly same way.¹⁶

According to the data, it is possible that the *sono*-demonstrative and the anaphoric predicate did nothing to disambiguate bare noun phrases in conditions (ii), (iii), and (v). Our theoretical prediction that they would play some role in doing so is not supported by the data. This finding shows that more work is needed to understand the similarities and differences between Japanese demonstratives and English definite phrases.

With this future objective in mind, let us briefly discuss the possibility that there is a genuine difference in the responses of the participants to (iv) and (v). One reason to consider this possibility non-negligible is that the revised Japanese noun phrases in (v) are very long and difficult to parse. The phrases in (12) are not the most natural choice of words if a user of them merely wants to refer back to Schmidt or Gödel. The participants could have been confused by the unwieldy way of saying something simple. These considerations might suggest that we need to devise a less demanding probe in testing one's judgments about demonstrative phrases.

To conclude, the outcomes of Experiment 2 are consistent with those of Experiment 1. The original English definite descriptions were intended to have the singular anaphoric interpretation, whereas the Japanese bare noun phrases in previous research were compatible with several different interpretations that were not shared by the original descriptions. In particular, the bare phrases have the indefinite narrow scope interpretation, which might have encouraged (A) answers. To exclude the indefinite narrow scope interpretation of Japanese bare noun phrases, Experiment 1 introduced two changes: the *sono*-demonstrative plus the anaphoric predicate and the predicates that clarify the intended readings. Experiment 2 shows that the second change contributed to the increased numbers of (B) answers (conditions iv and v). Nonetheless, some of the results of Experiment 2 were unexpected and require further studies to state precisely the relations between the conditions. Thus, the current study is very much in line with the spirit of experimental philosophy; having an objection to an experimental claim is “far from undermining our call for an experimental turn in the philosophy of language... it calls for more and more subtle experiments” (Machery and Stich 2012, 507).

5 Concluding remarks

In this paper, we have examined a previously overlooked confound in experimental studies on the semantic judgments of Western and East Asian individuals. Some of the previous research crucially relies on the assumption that bare noun phrases in Chinese or

¹⁶ Of course, we by no means claim that no studies will be able to show the existence of cross-cultural variation. Our main message is that the extant research suffers from the noun phrase ambiguity.

Japanese are strictly analogous to definite descriptions in English. Since bare noun phrases in Chinese and Japanese are generally ambiguous ('noun phrase ambiguity'), this assumption does not generally hold; there is no guarantee that the East Asian participants interpreted the bare noun phrases given to them as definite phrases equivalent to the English definite descriptions that were originally used in Machery et al. (2004). We have also reported two experiments on native Japanese speakers that examined the noun phrase ambiguity. The results of the experiments suggest that the semantic judgments of Japanese speakers concerning proper names may not diverge from those of English speakers.

The results of our experiments are incompatible with Machery et al.'s (2004) claim that East Asians tend to have descriptivist inclinations. We failed to replicate the data obtained by Machery et al. (2004, 2010, 2015) and Sytsma et al. (2015) when the probe was carefully calibrated to reflect the semantic and pragmatic features of the original English definite descriptions.¹⁷

The results are, on the other hand, in support of Lam's (2010, 327) suggestion that "perhaps cross-cultural... variations in answers to certain questions do not reveal genuine differences in semantic judgments, but rather differences in linguistic competence, or differences in abilities to understand precisely formulated questions." The confound of the noun phrase ambiguity and our experiments reported above point toward a different interpretation of the original study. It might be the case that the Hong Kong University students and the American peers who participated in the original study exhibited a slightly different way of understanding the subtle semantic and pragmatic features of the definite article *the*. The outcome is perhaps not surprising given that Hong Kong English has been observed to have different properties from standard British and American English.¹⁸

An implication for experimental design to be drawn from the preceding discussion is that it is not easy to guarantee that a probe written in one language gives rise to the same interpretation as a probe written in another language. Future research should incorporate elements that minimize the effects of idiosyncratic features of particular languages.¹⁹

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¹⁷ At the same time, the current study can be seen as replicating the *intra*-cultural results that speakers of one and the same language have differing semantic judgments; for example, the disambiguated condition in Experiment 1 obtained a 50-50 split.

¹⁸ See Sung (2015) and the sources cited there.

¹⁹ Perhaps, non-linguistically designed probes such as visual storytelling are preferable over linguistically encoded stimuli.

Appendix: Japanese Probes

Experiment 1

The Japanese translation of the Gödel vignette

ジョンという人物がいるとしよう。ジョンは大学で、ゲーデルは算術の不完全性という重要な数学の定理を証明した人物である、と教わった。ジョンは数学がとても得意で、不完全性定理についてその正確な内容を述べることができる。ジョンはこの定理の発見者はゲーデルだと思っているが、彼がゲーデルについて聞いたことがあるのはこれだけだった。ここで、ゲーデルはこの定理の考案者ではなかった、と想定してみよう。実は、「シュミット」と呼ばれる男が（その遺体はウィーンにおいて何十年も前に不可解な状況で発見された）その功績を成し遂げたのだった。シュミットの友人であったゲーデルは、何らかの手段をもちいてシュミットの手稿を手に入れ、その功績を自分のものにしたのである。以来、その功績はゲーデルのものとしてされている。こうして、彼は算術の不完全性を証明した人物として知られることとなった。「ゲーデル」という名前を聞いたことのある人のほとんどはジョンと同じである。つまり、ゲーデルについて聞いたことがあるのは、ゲーデルは不完全性定理を発見した、という主張だけである。

以上の話が本当だとして、「ゲーデル」という名前を使うとき、ジョンが話しているのは以下のどちらの人物でしょうか？

With Bare Noun Phrase Condition

- (A) 算術の不完全性を本当に発見した人物
- (B) 手稿を手に入れ功績を自分のものにした人物

Without Bare Noun Phrase Condition

- (A) 文中に出てきた、ジョンが知らない、算術の不完全性を本当に発見したその人物
- (B) 文中に出てきた、算術の不完全性を発見した人物と広く信じられているが、実際は手稿を手に入れ功績を自分のものにしたその人物

Experiment 2

Condition (ii)²⁰

- (A) 算術の不完全性を本当に発見したその人物
- (B) 原稿を手に入れ功績を自分のものにしたその人物

Condition (iii)

- (A) 文中に出てきた、算術の不完全性を本当に発見したその人物
- (B) 文中に出てきた、原稿を手に入れ功績を自分のものにしたその人物

Condition (iv)

- (A) ジョンが知らない、算術の不完全性を本当に発見した人物
- (B) 算術の不完全性を発見した人物と広く信じられているが、実際は原稿を手に入れ功績を自分のものにした人物

²⁰ Condition (i) = With Bare Noun Phrase; (v) = Without Bare Noun Phrase in Experiment 1. In Experiment 2, we replaced the word for “manuscript” (手稿) in Experiment 1 with a synonymous but more common expression (原稿) both in the vignette and the questions.

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