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WHY DON'T 2D JOKES FALL FLAT?

A TWO-DIMENSIONAL INTERPRETATION OF RUSSELL'S JOKE ABOUT THE YACHTS²

In recent critical comments on “On Denoting”, Saul Kripke says that Russell's famous analysis of joke about yachts in terms of degrees and graded positives is incorrect. His criticism has given rise to a number of issues related to interpreting cross-world comparisons like “X might have been greater than it is” in doxastic contexts like “John believes that P”. The main goal of this paper is to compare two approaches to cross-world predication in intensional contexts. One is Wehmeier’s subjunctive modal framework which distinctive feature is the use of two explicit mood markers. The other is Chalmers’s generalized epistemic two-dimensionalism, based on the idea of assigning all our expressions two kinds of intensions. Despite the fact that these approaches have of lot in common, they provide different interpretations of belief reports about cross-world comparisons. I argue that epistemic 2D framework is philosophically more relevant here than subjunctive markers approach.

JEL Classification: Z.

Keywords: cross-world predication, cross-world quantification, quantified modal logic, two-dimensional semantics, possible worlds, subjunctivity, comparatives, belief reports

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1. Introduction

The standard approach to cross-world predication goes back to Russell's "On Denoting" [Russell 1905]. Dealing with the joke about yachts Russell makes use of the notion of quantifier scope and employs quantification over certain abstract objects (degrees) associated with the predicates attributed across worlds. Let us recall the famous story of the irritable yachtsman:

When we say ... "So-and-so is surprising" or "So-and-so is true," etc., the "so-and-so" must be a proposition. Suppose now that "so-and-so" contains a denoting phrase. We may either eliminate this denoting phrase from the subordinate proposition "so-and-so," or from the whole proposition in which 'so-and-so' is a mere constituent. Different propositions result according to which we do. I have heard of a touchy owner of yacht to whom a guest, on first seeing it, remarked, "I thought your yacht was larger than it is"; and the owner replied, "No, my yacht is not larger than it is". [Russell, 1905, p. 52].

Let us denote the original sentence as (1) and its possible interpretation as (2) and (3):

- (1) I thought your yacht was larger than it is.
- (2) The size that I thought your yacht was is greater than the size of your yacht is.
- (3) I thought that the size of your yacht was greater than the size of your yacht.

Now the misunderstanding can be explained in terms of quantifier scope. Sentences (1) and (2) turns into the following formulas (where $s(y)$ stands for "the size of y ", and B is the doxastic operator "the guest believes that"):

$$(2') \exists x(B(x=s(y)) \ \& \ x>s(y))$$

$$(3') B\exists x(x=s(y) \ \& \ x>s(y))$$

According to Russell, (2') is what the guest actually meant, whereas (3') is the meaning attributed to him by the yachtsman. Kripke notes that Russell is right in general: "scope does

matter in intensional contexts” [Kripke, 2005, p.1005]. At the same time he alleges that (2') fails adequately to formalize (2), because it attributes an overly specific view to the guest, namely the view of the form $B(x = s(y))$, which implies existence of a unique size the guest thought the yacht was [Kripke, 2005, p.1021].

The Russellian “degree approach” faces at least three conceptual problems³:

1. *Apriority*. Russell supposes that the guest previously had some idea of the size of the yacht, but that need not be true. He doesn't have to have such a priori knowledge and he still can be surprised and say “I thought your yacht was larger than it is” [Kripke, 2005, p.1022].
2. *Vagueness*. The Russellian approach require an appeal to the degrees to which an individual might possess the positive. However, even if the guest had some idea of the size of the yacht, it need not be exact [Borisov, 2013, p. 222]. The presence of degrees seems to be epistemically inessential: “Why should we need to factor our reasoning through other objects first in order to understand the relation that x and w stand in to y and v ? Why not just reason about this relationship directly?” [Button, 2012, p. 246; Kocurek, 2016, p. 19]. The structure of yachts joke allows the predicates for which a quantitative expression is “difficult or impossible due to subjective preferences”, such as “more beautiful” [Surovtsev, 2013, p. 228-229].
3. *Platonism about degrees and numbers*. Perhaps the main philosophical problem with this approach is its “ontological commitment” to certain abstract objects [Kocurek, 2016, p. 17]. In his analysis Russell apparently makes use of reference to degrees and cardinal numbers, whereas the existence of these abstract entities is the question logic should remain neutral on.

The issues listed above indicate that the “degree approach” to analysis of sentences like (1) is rather questionable. At the same time, the very idea of disambiguating such sentences in terms of scope seems to be efficient.

2. Cross-world predication

Kripke's possible worlds semantics (PWS) for standard quantified modal logic (QML) implements the idea of scope very carefully. The quantifier scope (wide in (2') and narrow in

³ More detailed consideration of these and other problems can be found in [Kocurek, 2016].

(3')) determines the domain of quantification, which changes from world to world, and contains only the objects that actually exist in a given world. However, QML fails to capture some patterns of expression typical in many natural languages. Consider the following example:

(4) Some people could have been richer than they really are

Let R stand for “richer than”. How would one formalize (4)? On the one hand, a moment’s reflection shows that

(4') $\exists x \Diamond R(x,x)$

doesn't work. This says that for someone there is a possible world where she is richer than herself (in that world). On the other hand, it doesn't take much to see that

(4'') $\Diamond \exists x R(x,x)$

is also incorrect, because this says that in some possible world, someone (in that world) is richer than herself (in that world).

The most important feature of (4) is that it makes *cross-world comparisons*. This sentence relates objects in one world to *the same objects in another world*. To emphasize the difference, compare this with

(5) Everyone can be richer than their grandfather,

which says about an *intra-world* relation (relation between objects in the same world). It can be easily formalized as

(5') $\forall x \Diamond R(x,g(x))$.

Thus, QML fails to formalize some simple examples of cross-world predication. This is not just a syntax problem, because the core idea of PWS is largely the idea that all cross-world relations between individuals must be logically reducible to intra-world properties and relations. Gary Kemp puts the worry about this idea as follows: “if, for each world, we are given all the non-modal facts which hold at that world, then we have given all the modal facts without residue; for modal facts are nothing but generalisations about facts-at-worlds, non-modal facts at possible worlds. But then each possible fact must be a particular way things could have been – a possible world, specified either fully or only partly (in which case we can speak of what a certain class of fully specified possible worlds have in common). If that were not so, then the possible worlds apparatus could not be claimed as an adequate explication of necessity and possibility. Yet facts which reach between worlds clearly violate the idea that all possible facts are facts *at* worlds – that each possible world is a total way that things could be” [Kemp 2000, p. 309].

There have been many attempts to accommodate cross-world comparatives in QML. Kemp himself [Kemp 2000] considers two possible ways: (a) to employ term-binding indices like x_w (“*x-at-w*”) or (b) to generalize every n -ary relation R defined on n -tuples $\langle x_1, \dots, x_n \rangle$, to $2 \times n$ -ary relation R_+ defined on $2 \times n$ -tuples $\langle x_1, w_1, \dots, x_n, w_n \rangle$. Unfortunately, he finds both techniques conceptually inadequate.

Forbes [Forbes 1989] proposes to use term-binding “actually” operator A^t , which goes back to sentential actuality operator by M. Davies and L. Humberstone [Davies & Humberstone, 1980]. For instance, the formalization for the sentence

(6) John could be richer than Mary is

would then be

(6') $A^m \diamond R(j, m)$.

Unfortunately, that approach cannot deal with the sentence

(7) John might have been richer than he is,

because it is not clear which occurrences of j should bound by the operator A^j .

Melia [Melia, 2003] exploits the intuitive idea of actuality operators A_1, \dots, A_n , each bounding the fixed argument place of a given n -ary predicate symbol, like in

$$(6'') A_2 R(j,m).$$

Although this idea seems to be syntactically suitable, its semantics is overly artificial and unclear⁴

3. Cross-world subjunctive modal logic (CSML)

Wehmeier [Wehmeier, 2012] proposes a deliberated approach, based on subjunctive modal logic (SML). Instead of inventing new operators, Wehmeier starts with distinguishing grammatical moods in the syntax (i for “indicative”, s for “subjunctive”). The mood markers applied to predicates indicate the worlds relative to which we calculate their extensions. For instance, $R^{i,s}$ should be interpreted as a relation between an object in the actual world and (perhaps the same) object in counterfactual world. Thereby the formula

$$(6''') \Diamond R^{s,i}(j,m)$$

is to be a correct interpretation of (6). Moreover, Wehmeier’s account can be applied to sentences like

(8) Under certain circumstances, everybody would have been as rich as they might have been,

which requires a cross-world comparison between two merely possible worlds (that is no one of them is actual) [Wehmeier, 2012, p. 116]. In order to formalize it, we should add indices to the

⁴ The formal reconstruction and substantial criticism of that idea is presented in [Wehmeier, 2012, p. 111].

quantifiers and modal operators. These indices applied to a quantifier determine the domain of quantification, and applied to a modal operator they indicate world relative to which accessibility is determined. For instance, $\forall_1 x \Phi$ says that every x that exists in w_1 satisfies Φ , and $\Box_1 \Phi$ says that at every world v accessible to w_1 , Φ is true. Thus, the formalization of (8) would be

$$(8') \Diamond_1 \forall_1 x \neg \Diamond_2 R^{S_2, S_1}(x, x),$$

which says that there is a possible world w_1 , such that for every x (in w_1) is true that there is no possible world w_2 accessible to w_1 , where the same x (in w_2) is richer than x in w_1 . In this extended language one can express almost all⁵ possible patterns of cross-world predication and cross-world quantification.

4. Two-dimensional (2D) interpretation of cross-world predication

The approaches discussed in the preceding paragraphs focus on one type of intensional contexts, involving alethic modalities. Alethic modal operators are generally considered as indicating metaphysical possibility in terms of possible worlds. However, in Russell's joke about yachts we have an example of epistemic (doxastic) modality, which reflects states of belief in terms of possible worlds. Although metaphysical and epistemic modalities have a lot formal features in common, they substantially differ in some philosophical aspects.

The main difference concerns the interpretation of the very notion of possible world. A metaphysically possible world is "a way the world might have been", whereas an epistemically possible world (scenario) is rather "a complete description of what the world might be like together with the speaker's location within that world". Sometimes epistemically possible world are understood as *centered* worlds⁶.

The epistemic version of two-dimensionalism, developed by David Chalmers [Chalmers, 2004], provides a broadly rationalist account of meaning that aims to restore the so-called

⁵ Kocurek [Kocurek, 2016] offers even more powerful account based on quantified hybrid logic. As he formally proves, his approach is "a generalization of Wehmeier's framework that lifts various restrictions he placed on the models and the syntax" [Kocurek, 2016, Appendix B].

⁶ A centered possible world is a metaphysically possible world with a designated agent and time (given 2D assumptions about the plenitude of such worlds).

“golden triangle” of necessary constitutive relations between meaning, apriority, and necessity. As Chalmers puts it, “While acknowledging the aspects of meaning and modality that derive from Kripke, it promises to explicate further aspects of meaning and modality that are more closely tied to the rational domain” [Chalmers, 2006]. He argues that the 2D framework can be used to isolate an aspect of meaning that meets our philosophical intuitions about the epistemic necessity and to show its priority to the metaphysical one.

In this framework, the truth values of statements are relativized to possible worlds in two different ways: they depend both on what the facts in a “world of evaluation” are and on what the sentences mean in (a perhaps the same) “world of reference”. The key idea is that possible worlds can play two distinct roles: they serve as contexts of use (W_A : worlds considered as *actual*), and as circumstances of evaluation (W_C : worlds considered as *counterfactual*). In this framework every expression has at least two intensions: (1) its *primary intension* is a function $f: W_A \rightarrow E$ from actual worlds to extensions; (2) its *secondary intension* is a function $f: W_C \rightarrow E$ from counterfactuals worlds to extensions.

In addition to this general semantic framework, Chalmers proposes a special account of modal epistemology, widely known as modal rationalism (MR). This account establishes a secure link between *a priori* conceivability and metaphysical possibility:

(MR) Every epistemically possible scenario – a complete description of what the world might be like together with the speaker’s location within that world – describes a genuine metaphysically possible (centered) world.

Given this assumption, two-dimensionalism becomes a fruitful approach to the analysis of Russell's joke. Taking primary intension as epistemic intension one could explain the ambiguity of (1) in terms of centered worlds. What is required for a term to have an epistemic intension for a speaker is for that speaker to have the ability to identify extensions for a term given various hypotheses about the actual world. Therefore, the yachtsman’s mistake is not an evaluation of his guest’s sentence in a wrong world, but setting a wrong center in the right world. It is rather the primary intension of “the yacht” that creates a problem, not the secondary one. Let us consider

$$(2'') \exists x(B(x^s=i_y) \& x^i>i_y)$$

as a formalization of (2). This says that there is an object x in the domain of a possible world w accessible to the actual world $@$, such that in w it is true that x (in w) equals to y (in $@$), whereas in $@$ it is true that x (in $@$) is larger than y (in $@$).

I argue that (2'') formalizes (2) more accurately than (2') does, because (2'') takes into account the cross-world nature of “=” within the clause expressing belief of the guest. Besides, it is not committed to degrees.

At the same time, it is worth noting that the difference between identity (=) and counteridentity ($\overset{s}{=}^i$) is not clear within Wehmeier's framework. One could think that these two relations are basically of one kind, both stating the metaphysical identity of secondary (i.e. standard) intensions. In my opinion, the picture is more complicated. The point is that sentence $x\overset{s}{=}^i y$ state the identity of different intensions, namely the primary intension of x in $\langle w, g, t \rangle$ (centered world w with a designated agent g “guest” and time t of his belief) and the secondary intension of y in $@$. It should be clear, that metaphysical identity (=) is public, whereas counteridentity ($\overset{s}{=}^i$) is perspectival, determined by a specific agent's point of view inside the world.

Conclusion

To sum up, CSML is a better analytical tool than QML, especially for the cases like a famous joke about yachts. However, the extended Kripke-style possible world semantics for CSML that has been developed by Wehmeier leaves some key epistemic features of Russell's joke unattended. I argue that epistemic two-dimensionalism is philosophically more relevant here than subjunctive markers approach, because the centered worlds framework can be applied both to linguistic expressions and to thought contents. That is why I hope that the 2D-interpretation of jokes about belief attributions doesn't let them fall flat.

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