Marbles, happiness, and surprise

Floris Roelofsen

MARBLES

HAPPINESS

MARBLES

HAPPINESS

MARBLES

SURPRISE

GLOBAL OUTLINE

1 Reminder of Barbara's famous marbles argument

2 An old puzzle about happiness and surprise

3 How the marbles insight can help us solve the puzzle

Based on Roelofsen, Herbstritt, and Aloni (2016) and Roelofsen (2017).

PART 1

Marbles

(1)   a.   I found all of my ten lost marbles except for one.
           b.   **It** is probably under the sofa.

(2)   a.   I found only nine of my ten lost marbles.
           b.   #**It** is probably under the sofa.

- The meaning of a declarative sentence, or at least its role in discourse, is not fully determined by its truth-conditions.
- After all, (1-a) is truth-conditionally equivalent with (2-a).
- This has led to dynamic theories of meaning
  (Kamp, 1981; Heim, 1982; Groenendijk and Stokhof, 1991, among many others)

THE MARBLES ARGUMENT

(1)   a.   I found all of my ten lost marbles except for one.
        b.   **It** is probably under the sofa.

(2)   a.   I found only nine of my ten lost marbles.
        b. #**It** is probably under the sofa.

- These dynamic theories capture which discourse referents a sentence makes available for subsequent anaphoric reference.
- (1-a) introduces a discourse referent that serves as antecedent for the anaphoric pronoun in (1-b).
- (2-a) does not introduce such a discourse referent; as a consequence, (2-b) is infelicitous.

An old puzzle about happiness and surprise

- The first article in the first volume of *Linguistics and Philosophy* was … (10 points)

AN OLD PUZZLE ABOUT HAPPINESS AND SURPRISE

- The first article in the first volume of *Linguistics and Philosophy* was … (10 points)

    Lauri Karttunen's *Syntax and Semantics of Questions*

- The first article in the first volume of *Linguistics and Philosophy* was … (10 points)

    Lauri Karttunen's *Syntax and Semantics of Questions*

- The first issue raised in this paper was: … (20 points)

- The first article in the first volume of *Linguistics and Philosophy* was … (10 points)

    Lauri Karttunen's *Syntax and Semantics of Questions*

- The first issue raised in this paper was: … (20 points)

    Should all embedded questions be taken to belong to the same syntactic category?

- The first article in the first volume of *Linguistics and Philosophy* was … (10 points)

  Lauri Karttunen's *Syntax and Semantics of Questions*

- The first issue raised in this paper was: … (20 points)

  Should all embedded questions be taken to belong to the same syntactic category?

- In particular, should wh-questions be treated as belonging to the same syntactic category as whether-questions?

- To answer this question, Karttunen compared the distribution of these two types of questions.

- By and large, they have the same distribution. For instance:

(3)   a.   John knows what they serve for breakfast.
        b.   John knows whether they serve breakfast.

(4)   a.   *John believes what they serve for breakfast.
        b.   *John believes whether they serve breakfast.

- But there are exceptions!

So-called emotive factives like *be happy*, *surprise*, *amaze*, *bother*, and *disappoint* take *wh*-complements but not *whether*-complements:

(5) a. Mary was happy about what they served for breakfast.
     b. *Mary was happy about whether they served breakfast.

(6) a. It is surprising what they serve for breakfast.
     b. *It is surprising whether they serve breakfast.

AN OLD PUZZLE ABOUT HAPPINESS AND SURPRISE

- Karttunen concludes:

  > *The ungrammaticality of* whether-*questions under emotive factives poses problems for me and requires some special treatment. Nevertheless, it seems correct to assume, in the light of the great majority of cases of overlapping distribution, that* wh-*questions and* whether-*questions should be assigned to the same syntactic category.*

- In much subsequent work, Karttunen's conclusion has been taken to heart.
- But if *wh*-questions and *whether*-questions are indeed of the same syntactic category, a semantic or pragmatic explanation is needed for the contrast found under emotive factives.
- I will refer to this as the *whether*-puzzle.

PART 3

An account

We need to understand two things:

❶ Questions

What is the crucial semantic/pragmatic difference between *wh*-questions and *whether*-questions?

❷ Clause-embedding predicates

What is special about emotive factives? What is the relevant property that they share, and that distinguishes them from other clause-embedding predicates?

WH-QUESTIONS VERSUS WHETHER-QUESTIONS

First important observation:

It is impossible to account for the contrast between *wh*-questions and *whether*-questions just in terms of their resolution conditions.

(7)   *Context: Ann and Chris have placed an order online. They are kept up to date about the status of the order, which is first 'in progress' and then at some point turns into 'sent'. Ann looks at her email and then tells Chris:*

   a.   I'm surprised what the status of the order is.
   b.   *I'm surprised whether the order is still in progress.

- Both embedded questions have the same resolution conditions.
- Yet, the *wh*-question is licensed but the *whether*-question is not.

- So to account for the puzzle, we need a semantics of questions which captures more than just their resolution conditions

  (which is what most semantic theories of questions do)

- What, then, *is* the relevant difference between *wh*-questions and *whether*-questions?

- So to account for the puzzle, we need a semantics of questions which captures more than just their resolution conditions

  (which is what most semantic theories of questions do)

- What, then, *is* the relevant difference between *wh*-questions and *whether*-questions?

- Note the similarity with Barbara's marble cases:
  - There we saw that there is more to the semantics of a declarative sentence than its truth-conditions.
  - Here, we see that there is more to the semantics of a question than its resolution-conditions.

- To understand the marble cases we had to take discourse referents into account.

- Might this also help in solving the *whether*-puzzle?

- To understand the marble cases we had to take discourse referents into account.

- Might this also help in solving the *whether*-puzzle?

- Of course, for this to work, we should first look for independent evidence that *wh*-questions and *whether*-questions differ in the discourse referents that they make available.

But such evidence is easy to find:

(8)   Is the order still in progress?
      a.   Yes.
      b.   No.
      c.   If so / otherwise, …

(9)   What is the status of the order?
      a.   #Yes.
      b.   #No.
      c.   #If so / otherwise, …

In particular, it has been argued in the literature on answer particles (*yes*/*no*) and fragment answers that:

- A polar question like: 'highlights' the proposition:

  (10)   Did Bill pass? $\lambda w.\text{PASSED}(b)(w)$

- A *wh*-question like: 'highlights' the property:

  (11)   Who passed? $\lambda x.\lambda w.\text{PASSED}(x)(w)$

(Groenendijk and Stokhof, 1984; Krifka, 2001; Aloni *et al.*, 2007; Roelofsen and Farkas, 2015)

- More generally, if Q is a question with n *wh*-elements ($n \geq 0$), Q can be taken to highlight one or more *n*-place properties.

  - A polar question highlights a 0-place property—a proposition;
  - An alternative question highlights multiple propositions;
  - A simple *wh*-question highlights a 1-place property;
  - A multiple *wh*-question highlights an *n*-place property, $n \geq 2$.

- Thus, in dynamic semantics, the various question types can be teased apart, even if their resolution conditions coincide.

- This was one of the things needed to solve the *whether*-puzzle.

HAPPINESS AND SURPRISE

- What about predicates like *be happy* and *surprise*?

- What is it that they have in common, and that distinguishes them from other clause-embedding predicates?

HAPPINESS AND SURPRISE

- What about predicates like *be happy* and *surprise*?

- What is it that they have in common, and that distinguishes them from other clause-embedding predicates?

- We start with an empirical observation from d'Avis (2002):

    When emotive factives take a *wh*-question as their complement, they give rise to a strong existential presupposition.

- For instance:

    (12)   It's surprising who passed.
            ↝ someone passed

    (13)   It's not surprising who passed.
            ↝ someone passed

- It is odd to cancel the existential implication:

    (14)   It's surprising who passed, *if anyone did.
    (15)   Bill is happy about who passed, *if anyone did.

- Compare this with other verbs:

    (16)   The teacher knows who passed, if anyone did.
    (17)   Please tell me who passed, if anyone did.

WHAT IS BEHIND THE EXISTENTIAL PRESUPPOSITION?

- Which general feature of emotive factives could be behind this existential presupposition?

Proposal: emotive factives express a certain attitude (happiness, surprise, etc) about one or multiple true instances of the property highlighted by their complement.

- For instance, to be surprised at who passed the exam is to be surprised about one or more people who did in fact pass the exam that they did.

- So, in order to be surprised at who passed, there has to be someone who passed.

This distinguishes 'emotive factives' from other predicates, which are either:

- about the true extension of their complement:
  e.g., *know*, *discover*

- about the intension of their complement:
  e.g., *wonder*, *be certain*

A complement can very well have a well-defined intension and true extension even if the property it highlights has no true instances.

Let's say that an n-place property P is satisfiable in a world w iff there is at least one tuple t of n individuals such that $P(t)$ is true in w.

Existential presupposition of emotive factives

An emotive factive triggers the presupposition that every property highlighted by its complement is satisfiable in the world of evaluation.

Note: if P is a 0-place property, i.e., a proposition, then it is satisfiable in w just in case it is true in w.

Presupposition. $[\![\varphi\ \textit{surprises}\ x]\!]^w$ is defined iff:

① Every property highlighted by φ is **satisfiable** in w;

② For every property P highlighted by φ and every tuple t such that $P(t)$ is true in w, x **believes** in w that $P(t)$ is true.

Assertion. $[\![\varphi\ \textit{surprises}\ x]\!]^w = 1$ iff:

① The above two conditions are fulfilled;

② For every property P highlighted by φ there is a tuple t such that $P(t)$ is true in w and **unexpected** for x in w.

Note: the entry applies uniformly to **declarative** and **interrogative** complements.

The entry is sufficient for our current purposes, but not intended to be completely realistic. For various refinements, orthogonal to our main concerns here, see George (2011), Theiler (2014), Spector and Egré (2015), and Uegaki (2015), among others.

PART 4

Predictions

- Consider a case with a *wh*-complement:

  (18)   It's surprising who passed.

- In this case, the complement highlights a 1-place property:

  (19) $\lambda x.\lambda w.\textsc{passed}(x)(w)$

- The presupposition triggered by *surprise* is that this property is satisfiable in the world of evaluation, i.e., that someone passed.

- This is exactly the existential requirement observed by d'Avis.

THE CASE OF DECLARATIVE COMPLEMENTS

- Now consider a case with a declarative complement:

  (20)   It's surprising that Bill passed.

- This time, the complement highlights a proposition:

  (21) $\lambda w.\text{PASSED}(b)(w)$

- The presupposition triggered by *surprise* is that this proposition is true in the world of evaluation, i.e., that Bill passed.

- This is the factivity presupposition of *surprise*.

- Finally, and crucially, consider a *whether*-complement:

  (22)   *It's surprising whether Bill passed.

- Again, the complement highlights a proposition:

  (23) $\lambda w.\textsc{passed}(b)(w)$

- The presupposition triggered by *surprise* is that this proposition is true in the world of evaluation, i.e., that Bill passed.

- This is the same presupposition that we derived in the case of a declarative complement.

Proposal: *whether*-complements are degraded under emotive factives because, due to the existential presupposition, the same meaning can always be expressed in a simpler way, using a *that*-complement.

- The following are predicted to be semantically equivalent:

    (24)   *It's surprising that Bill passed.

    (25)   *It's surprising whether Bill passed.

- Such equivalences systematically arise because:
    - *whether*-complement always highlight the same proposition as the corresponding *that*-complements, and
    - *surprise* is only sensitive to what is highlighted by its complement.

Proposal: *whether*-complements are degraded under emotive factives because, due to the existential presupposition, the same meaning can always be expressed in a simpler way, using a *that*-complement.

- Arguably, *that*-complements are less complex than *whether*-complements in terms of processing.

- As a result, they are more likely to be interpreted as intended.

- This, we suggest, leads to blocking of *whether*-complements under emotive factives.

  (cf., Horn, 1984; Blutner, 2000)

CONCLUSION

- Barbara's marble cases show that there is more to the meaning of a declarative sentence than its truth conditions.

- Similarly, the *whether*-puzzle shows that there is more to the meaning of a question than its resolution conditions.

- To handle the marble cases, it is necessary to keep track of the discourse referents that sentences introduce.

- This also paves the way for an account of the *whether*-puzzle.

- The crucial difference between *whether*- and *wh*-complements is that they highlight different properties.

- The crucial feature of emotive factives like *be happy* and *surprise* is that they express an attitude about one or more true instances of the property highlighted by their complement.

THANK YOU

Aloni, M., Beaver, D., Clark, B., and van Rooij, R. (2007). The dynamics of topics and focus. In M. Aloni, A. Butler, and P. Dekker, editors, *Questions in Dynamic Semantics*. Elsevier.

Blutner, R. (2000). Some aspects of optimality in natural language interpretation. *Journal of Semantics*, **17**(3), 189.

d'Avis, F.-J. (2002). On the interpretation of *wh*-clauses in exclamative environments. *Theoretical linguistics*, **28**(1), 5–31.

George, B. R. (2011). *Question embedding and the semantics of answers*. Ph.D. thesis, University of California, Los Angeles.

Groenendijk, J. and Stokhof, M. (1984). *Studies on the Semantics of Questions and the Pragmatics of Answers*. Ph.D. thesis, University of Amsterdam.

Groenendijk, J. and Stokhof, M. (1991). Dynamic predicate logic. *Linguistics and Philosophy*, **14**, 39–100.

Heim, I. (1982). *The Semantics of Definite and Indefinite Noun Phrases*. Ph.D. thesis, University of Massachusetts, Amherst.

Horn, L. R. (1984). Towards a new taxonomy of pragmatic inference: Q-based and R-based implicatures. In D. Schiffrin, editor, *Meaning, Form, and Use in Context*, pages 11–42. Georgetown University Press.

Kamp, H. (1981). A theory of truth and semantic representation. In J. Groenendijk, T. Janssen, and M. Stokhof, editors, *Formal Methods in the Study of Language*, pages 277–322. Mathematical Centre, Amsterdam.

Krifka, M. (2001). For a structured meaning account of questions and answers. *Audiatur Vox Sapientia. A Festschrift for Arnim von Stechow*, pages 287–319.

Roelofsen, F. (2017). Suprise for Lauri Karttunen. To appear in *Lauri Karttunen Festschrift*, edited by Cleo Condoravdi.

Roelofsen, F. and Farkas, D. F. (2015). Polarity particle responses as a window onto the interpretation of questions and assertions. *Language*, **91**(2), 359–414.

Roelofsen, F., Herbstritt, M., and Aloni, M. (2016). The *whether puzzle. To appear in *Questions in Discourse*, edited by Klaus von Heusinger, Edgar Onea, and Malte Zimmermann.

Spector, B. and Egré, P. (2015). A uniform semantics for embedded interrogatives: An answer, not necessarily the answer. *Synthese*, **192**(6), 1729–1784.

Theiler, N. (2014). A multitude of answers: Embedded questions in typed inquisitive semantics. University of Amsterdam, MSc thesis.

Uegaki, W. (2015). *Interpreting questions under attitudes*. Ph.D. thesis, Massachusetts Institute of Technology.