What is at-issueness? An experimental comparison of diagnostics

Abstract At-issueness is a key concept in theoretical semantics/pragmatics, but there is no consensus about how it is defined or diagnosed (e.g., Tonhauser 2012; Tonhauser et al. 2018; Koev 2018). We present experimental data investigating whether four widely used diagnostics for at-issueness yield consistent results. Our findings reveal significant differences across diagnostics, indicating they are not interchangeable. Since the diagnostics target distinct theoretical conceptions of at-issueness, these differences offer insight into their comparability.

1 Introduction

At-issueness is a key concept in theoretical semantics and pragmatics, distinguishing between at-issue propositions conveyed by an utterance, those contributing to its main point, and those that do not (e.g., Karttunen & Peters 1979; Horton & Hirst 1988; Abbott 2000; Faller 2003; Potts 2005; Tonhauser 2012). Despite its importance, the concept lacks a unified definition. Instead, various theoretical notions (Koev 2018; Tonhauser et al. 2018) and empirical diagnostics (e.g., Tonhauser 2012) have been proposed. This paper addresses the question whether four widely used diagnostics for at-issueness yield consistent results when testing the same stimuli. Our findings reveal significant differences across diagnostics, indicating they are not interchangeable. Since the diagnostics target distinct theoretical conceptions of at-issueness, these differences offer insight into their comparability.

The four diagnostics we tested are illustrated in (1–4) for sentence-medial non-restrictive relative clauses (NRRCs), which are usually taken to contribute non-at-issue content. As appositive content is generally taken to be not-at-issue, participants are expected to: Give low naturalness ratings under the QUD diagnostic (1) and the direct dissent diagnostic (3), not interpret the speaker to be asking about the content under the 'asking-whether' diagnostic in (2), will choose one of the *yes*-responses under the 'yes, but' diagnostic in (4).

(1) QUD diagnostic (e.g., Tonhauser 2012; Chen 2024)

A: *What did Greg buy?*
B: *Greg, who bought a new car, is envied by his neighbor.*

Question to participants: How well does B's response fit A's question?

(2) 'asking whether' diagnostic (e.g., Tonhauser et al. 2018; Solstad & Bott 2024)

Is Greg, who bought a new car, envied by his neighbor?

Question to participants: Is the speaker asking whether Greg bought a new car?

(3) Direct dissent diagnostic (e.g., Tonhauser 2012; Syrett & Koev 2015)

A: *Greg, who bought a new car, is envied by his neighbor.*
B: *No, that's not true, he didn't buy a new car.*

Question to participants: How natural is B's rejection of A's utterance?

(4) 'yes, but' diagnostic (e.g., Xue & Onea 2011; Destruel et al. 2015)

A: *Greg, who bought a new car, is envied by his neighbor.*
B: *Yes, but he didn't buy a new car.* /
Yes, and he didn't buy a new car. /
No, he didn't buy a new car.

Task for participants: Choose the response that sounds best.

The diagnostics reflect different theoretical conceptions of at-issueness (Koev 2018), and they have led to different empirical results, discussed below.

1.1 QUD-based diagnostics

The diagnostics in (1) and (2) are based on the assumption that discourse is organized around addressing a question under discussion (QUD) (Roberts 1996; Ginzburg 1996), and that the at-issue content of an utterance addresses a QUD that is established by the preceding discourse (Amaral et al. 2007)[1]. This notion, defined explicitly in Simons et al. 2010, is labeled Q(uestion)-at-issueness in Koev's 2018 overview:

(5) Q-at-issueness: (based on Simons et al. 2010: 26, Koev 2018: 2)
A content *m* is Q-at-issue in a context *c* iff
a. *m* is relevant to the QUD in *c*, and
b. *p* is appropriately conventionally marked relative to the QUD.

Here, *m* may be either a propositional content or a question meaning. Relevance to the QUD is defined as follows:

(6) Relevance to the QUD in context *c* (based on Simons et al. 2010: 13)
a. A proposition *p* is relevant the QUD iff it contextually entails in *c* a partial or complete answer to the QUD.
b. A question *q* is relevant to the QUD, iff it has an answer that is relevant to the QUD.

1.1.1 QUD-diagnostic

The QUD-diagnostic from Tonhauser 2012 operationalizes Q-at-issueness through naturalness judgments. It builds on two assumptions:

i. An overt question explicitly introduces a QUD.[2]
ii. An utterance is felicitous only if its at-issue content is relevant to the QUD (Amaral et al. 2007; Tonhauser 2012).

To test whether a given content *m* can be construed as Q-at-issue, participants are presented with a context that establishes a QUD via an overt question, followed by a response that includes *m*. For instance, (1) is used to diagnose the status of the content *m* of the appositive RC (Greg bought a car) conveyed by B's utterance *U*, by presenting it as a response to a question *Q* that *m* is relevant to (What did Greg buy?), and asking a naturalness rating for *U* as a response to *Q*.

(1) A: *What did Greg buy?*
B: *Greg, who bought a new car, is envied by his neighbor.*
Question to participants: How well does B's response fit A's question?

If *m* (Greg bought a car) is interpreted as addressing the QUD, the response should receive high naturalness ratings. However, responses like (1B) typically receive low ratings, suggesting that *m* is not at-issue, that is, even though *m* is relevant to *Q* and thereby satisfies the first part of the definition in (5a). The low naturalness should, therefore, reflect that *m* is not-at-issue due to the second part of the definition in (5b): The low ratings for (1B) support the claim that appositive RCs are not appropriately conventionally marked to contribute at-issue content.

[1] is this the right reference?
[2] add reference

1.1.2 Asking whether

Because the definition in (5) references the preceding context, Koev (2018) suggests that QUD-at-issueness is a backward-looking notion of at-issueness. However, overt questions may explicitly raise a QUD[3], and thereby make a content Q-at-issue in the subsequent discourse. This is what is targeted by the 'asking whether' diagnostic in (2) (Tonhauser et al. 2018), based on the assumption that it is the at-issue content of interrogatives that partitions the context set, as opposed to their non-at-issue content (p.502).

(2) *Is Greg, who bought a new car, envied by his neighbor?*
Question to participants: Is the speaker asking whether Greg bought a new car?

explain explain If participants respond "no," this suggests that the appositive content (Greg bought a new car) is not part of the at-issue content of the interrogative, providing evidence that it is not Q-at-issue. This diagnostic thus complements the QUD-diagnostic by probing the at-issueness of content from the perspective of explicitly raised questions rather than previously established ones.

1.2 Proposal at-issueness

The direct dissent diagnostic (3) and the 'yes, but' diagnostic (4) reflect the notion of P(roposal)-at-issueness, based on the assumption that at-issue content contributes to the main assertion of an utterance, which is taken to constitute a proposal to update the common ground.

(7) P-at-issueness: (Koev 2013; 2018)
A proposition p is P-at-issue in a context c iff
a. p is a proposal in c and
b. p has not been accepted or rejected in c.

1.2.1 Direct dissent/assent

(3) A: *Greg, who bought a new car, is envied by his neighbor.*
B: *No, that's not true, he didn't buy a new car.*
Question to participants: How natural is B's rejection of A's utterance?

1.2.2 yes, but

(4) A: *Greg, who bought a new car, is envied by his neighbor.*
B: *Yes, but he didn't buy a new car.* /
Yes, and he didn't buy a new car. /
No, he didn't buy a new car.
Task for participants: Choose the response that sounds best.

1.3 Previous findings

Prior research has identified disagreements, potentially arising from diagnostic differences:

1.3.1 Medial appositives.

Based on impressionistic judgment data, Koev 2018 argues that medial appositives can be Q-at-issue, but not P-at-issue. An experimental study in Syrett & Koev 2015 found that sentence-medial

[3] add reference

appositives are less at-issue than sentence-final ones using the direct dissent test, Drozdov 2024 found no difference with the 'asking whether' diagnostic.

To investigate how consistent the diagnostics are, we conducted four experiments measuring the at-issueness of the same contents across diagnostics.

2 Experiments

To compare the results of at-issueness diagnostics, we conducted four experiments that each measured at-issueness with a different diagnostic, namely the QUD diagnostic (Exp. 1), the 'asking whether' diagnostic (Exp. 2), the direct dissent diagnostic (Exp. 3) and the 'yes, but' diagnostic (Exp. 4). To be able to compare the results of the diagnostics, the same seven contents shown in (8) were investigated under the four diagnostics, namely the contents of sentence-medial and sentence-final NRRCs, as well as the contents of the clausal complements of *know, discover, confess, confirm* and *be right*. These seven contents were instantiated by the same items across the four experiments.

(8) a. Content of sentence-medial NRRC
Lucy, who broke the plate, apologised. ⇝ Lucy broke the plate
b. Content of sentence-final NRRC
The police found Jack, who saw the murder. ⇝ Jack saw the murder
c. Content of the clausal complement of *know*
Ann knows that Raul cheated on his wife. ⇝ Raul cheated on his wife
d. Content of the clausal complement of *discover*
Mary discovered that Denny ate the last cupcake. ⇝ Denny ate the last cupcake
e. Content of the clausal complement of *be right*
Tom is right that Ann stole the money. ⇝ Ann stole the money
f. Content of the clausal complement of *confirm*
Harry confirmed that Greg bought a new car. ⇝ Greg bought a new car
g. Content of the clausal complement of *confess*
Lucy confessed that Dustin lost his key. ⇝ Dustin lost his keys

In each experiment, participants read the stimuli and gave ratings corresponding to the diagnostics.

2.1 Methods

2.1.1 Participants

For each of the four experiments, we recruited 80 participants on Prolific. These participants had registered on the platform as monolingual native speakers of English who lived in the USA. They had at least 100 previous submissions and an approval rate of at least 97%.

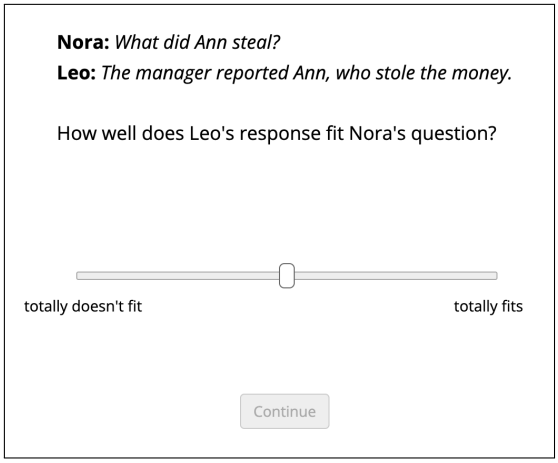
Table 1...

	recruited	ages	mean age	female	male	nonbinary	did not disclose
Exp. 1							
Exp. 2							
Exp. 3							
Exp. 4							

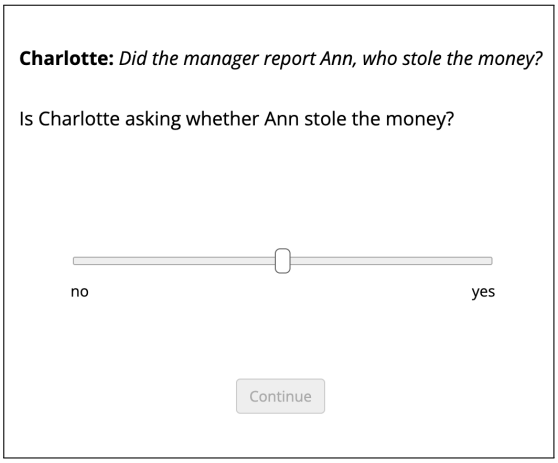
Table 1: Information about the participants recruited in Exps. 1-4.

2.1.2 Materials and procedure

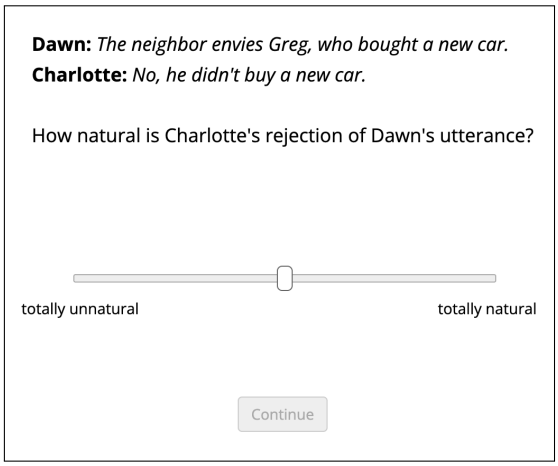
Each content type was instantiated by one of seven items (e.g., 'Greg bought a new car') and realized as either an assertion (1), (3), (4) or a polar question (2). Participants responded for the seven target stimuli and two control stimuli, by adjusting a slider for (1–3), or by choosing a response in (4).



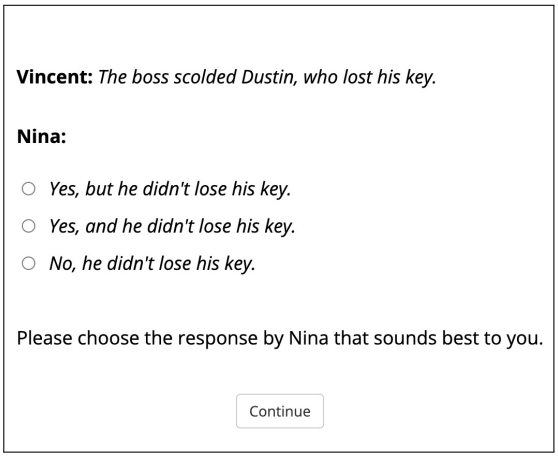
(a) Exp. 1: QUD diagnostic



(b) Exp. 2: 'asking whether' diagnostic



(c) Exp. 3: 'direct dissent' diagnostic



(d) Exp. 4: 'yes, but' diagnostic

Figure 1: Sample trials in (a) Exp. 1, (b) Exp. 2, (c) Exp. 3, and (d) Exp. 4.

2.1.3 Data exclusion

We excluded the data of participants who did not self-identify as native speakers of American English and of participants whose responses to the xxx was more than 2 sd away from the group mean WHAT ABOUT EXP 4?

Table 2 identifies how many participants were excluded in each experiment, the properties of the remaining participants, and the number of data points that entered into the analyses.

		exclusion criterion		remaining participants						
	recruited	language	fillers	ages	mean age	f	m	nb	dnd	data points
Exp. 1										
Exp. 2										
Exp. 3										
Exp. 4										

Table 2: Information about the participants excluded in Exps. 1-4.

2.2 Results

Figure 2 shows the mean responses by content for the four diagnostics. Comparing the results across diagnostics reveals some key differences.

First, the diagnostics vary in their sensitivity to differences between contents: The by-content means in Experiment 2 ('asking whether' diagnostic) show a larger range (Figure 2(b)) than in the other three experiments (Figures 2(a), 2(c) and 2(d)).

Second, the content manipulation affects the ratings differently across the four diagnostics, sometimes in opposite directions. This results in a different order of predicates by response means between experiments.

- For instance, *be right* ranks highest under the 'asking whether' diagnostic (Figure 2(b)), and the 'yes, but' test (Figure 2(d)), but ranks lowest under the QUD-diagnostic (Figure 2(a)), and shows no clear effect in the direct dissent diagnostic (Figure 2(c)).
- Analysis similar to what we did in projection study? – Interaction effects
- How about something similar to the rank-analysis that Yvonne Kilian did for comparing diagnostics?

2.3 Discussion

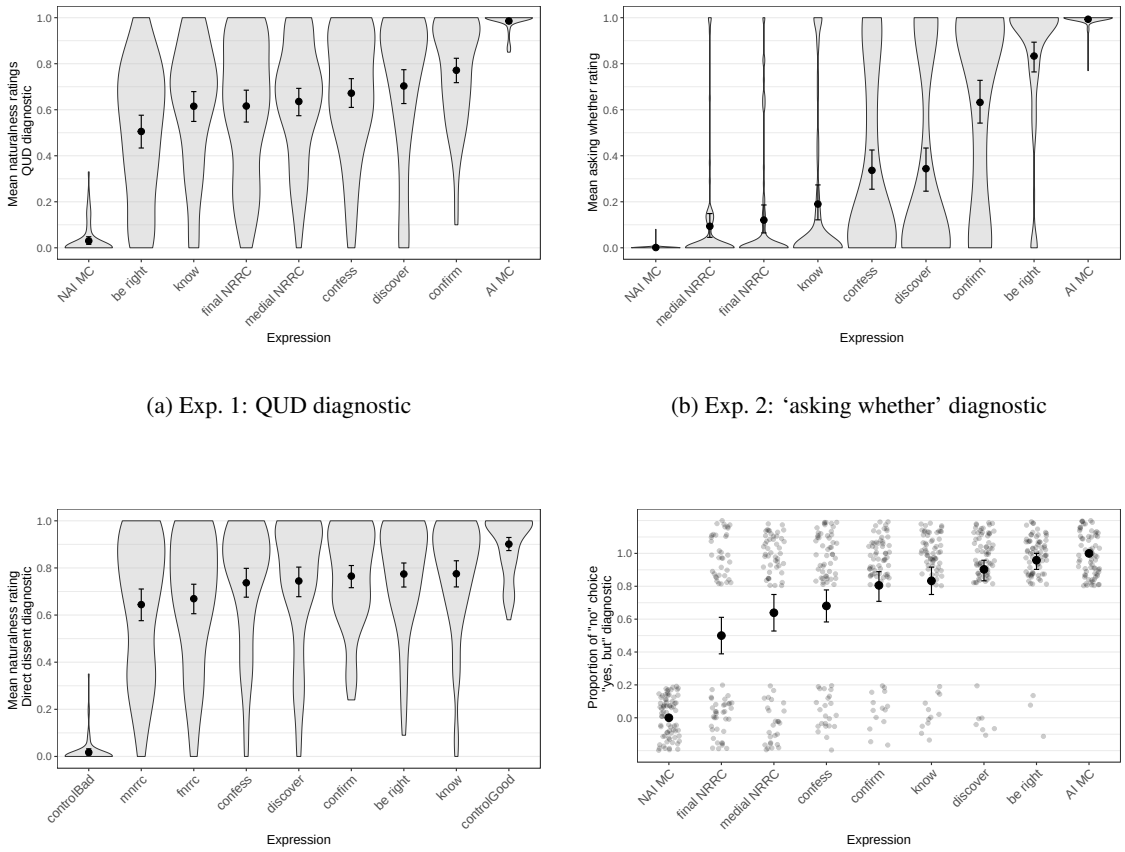
The differening results between diagnostics suggest that they are not interchangeable.

2.3.1 Sensitivity

- Further, while the 'asking whether' diagnostic, for contents embedded in questions, is sensitive enough to detect fine-grained differences between contents, the smaller range of response means for the other diagnostics could suggest the need for a more sensitive diagnostic for contents embedded in declarative assertions.
- We did not replicate the effect reported in Syrett & Koev 2015, that sentence-final NRRCs receive higher at-issueness ratings than sentence-medial ones.
- Additional comparison to Syrett & Koev 2015 (details omitted in the abstract) points to potential effects of the response task and the speech act of the utterance embedding the tested content.

2.3.2 Order

- In particular, the varying relative order of by-content means across diagnostics provide an initial argument that they target distinct properties of the content.



(a) Exp. 1: QUD diagnostic

(b) Exp. 2: 'asking whether' diagnostic

(c) Exp. 3: 'direct dissent' diagnostic

(d) Exp. 4: 'yes, but' diagnostic

Figure 2: Results of Exps. 1–4. Panels (a)–(c) show the mean responses by content for the QUD diagnostic in Exp. 1 (a), the 'asking whether' diagnostic in Exp. 2 (b), and the 'direct dissent' diagnostic in Exp. 3 (c). Panel (d) shows the proportion of 'no' choices by content for the 'yes, but' diagnostic in Exp. 4. Error bars indicate 95% bootstrapped confidence intervals. Violin plots in panels (a)–(c) show the kernel probability density of individual participants ratings. Gray dots in panel (d) represent individual participant responses (either no or one of the yes-responses, jittered vertically and horizontally for legibility).

3 Theoretical implications

4 Conclusion

The conclusion is the last numbered section, and any ensuing sections are unnumbered.

Abbreviations (if applicable)

ACC = accusative, DAT = dative, DEM = demonstrative, NOM = nominative, PL = plural, SG = singular

For the standard abbreviations to be used here, refer to the Leipzig glossing rules.

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If any of the authors have any competing interests then these must be declared. Guidelines for competing interests can be found here. If there are no competing interests to declare then the following statement should be present: 'The author(s) has/have no competing interests to declare'.

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