

Attributing Beliefs and Attitudes when the Experiencer is Implicit: The Difference between Discourse and Attitude Adjectives

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Introduction

This paper introduces and provides a linguistic analysis of Discourse Adjectives (Taranto, 2003), a natural class whose members include *apparent*, *evident*, *clear*, and *obvious*, and contrasts them with another class of proposition-taking adjectives; a class that will be referred to here as “Attitude Adjectives” (*absurd*, *intriguing*, *ridiculous*).

The identification Discourse Adjectives, and their contrast with Attitude Adjectives is relevant to the exploration of attitude and affect in text as both classes license implicit experiencer arguments. However, the implicit experiencers licensed are not interpreted in the same way, and the distinction in their interpretations is subtle: the default interpretation for implicit experiencers of Discourse Adjective is the discourse participants, while the default for the implicit experiencer of Attitude Adjectives is the speaker only.

This paper presents data illustrating the distinct, yet partially overlapping syntactic distribution of these adjective types, and identifies the characteristics to which any computational model will need to be sensitive in order to accurately attribute attitudes to appropriate discourse entities. While no formal model is proposed at this time, an approximation of one such model is suggested.

The Data

Examples of Discourse Adjectives (DAs) are provided in (1).

- (1) a. It is clear that Briscoe is a detective.
b. It is clear to me that Briscoe is a detective.
c. It is clear to everyone that Briscoe is a detective.
d. It is clear to you and me that Briscoe is a detective.

Of primary concern are the semantics of DAs in sentences like (1a), in which the conceptually necessary experiencer of *clear* is not expressed overtly, and is interpreted like (1d), with the relevant experiencers of clarity interpreted as both the speaker and the addressee. This is noteworthy, since with other adjectives, an implicit experiencer is interpreted as either the speaker or people in general (the so called ‘arbitrary’ reading; Rizzi 1986), rather than all interlocutors. Note the contrast between (1a) and (2).

- (2) It is absurd that Briscoe is a detective.

The difference is that after the model is updated with a sentence containing a DA such as (2), the interlocutors are justified as behaving, at least for the purposes of their current conversation, as if the proposition expressed by *Briscoe is a detective is clear* is believed by all discourse participants. In contrast, after the utterance with the Attitude Adjective (AA) *absurd* in (2), the discourse participants are not justified in behaving as if all are in agreement regarding the absurdity of the proposition. With AAs, the subjective quality, or opinion denoted by the adjective is accurately attributed solely to the speaker, it cannot be attributed to the addressee without the addressee’s overt consent.

A difference in the syntactic distribution of DAs and AAs corresponds to this semantic distinction. The similarity between the two is that they both occur in the extraposed structure in (3), and they both disallow “Raising” as in (4).

- (3) a. It is clear that the suspect was not advised of her Miranda Rights. (DA)
- b. It is absurd that the suspect was not advised of her Miranda Rights. (AA)

- (4) a. *The accused is clear to be released on bail. (DA)
- b. *The accused is absurd to be released on bail. (AA)

There are three main syntactic differences between the classes. First, DAs but not AAs license an overt experiencer, thus only DAs occur with a prepositional phrase indicating an experiencer, as in (5).

- (5) a. It is clear to the D.A. that getting a conviction will be difficult (DA).
- b. *It is absurd to the D.A. that getting a conviction will be difficult (AA).

Second, DAs but not AAs, occur with *wh*-complements, as in (6) and (7).

- (6) a. It is usually clear whether or not a jury will buy a “guilty by reason of insanity plea”. (DA)
- b. *It is usually absurd whether or not a jury will buy a “guilty by reason of insanity plea”. (AA)

- (7) a. It is clear how to prosecute a case like this. (DA)
- b. *It is absurd how to prosecute a case like this. (AA)

Finally, AAs, but not DAs occur with extraposed infinitival complements that are not embedded under *wh*-words, as in (8). In this case, the subject of the infinitival complement has an arbitrary interpretation.

- (8) a. *It is clear to address the court in iambic pentameter. (DA)
- b. It is absurd to address the court in iambic pentameter. (AA)

A table summarizing the distribution of DAs and AAs is in (9), with bold type indicating structures in which only one of the two types of adjectives is licensed.

(9) Summary of the Distribution of Discourse and Attitude Adjectives

	DAs	AAs
Extraposition	yes	yes
Subject Raising	no	no
Overt Experiencer	yes	no
Wh-tensed	yes	no
Wh-infinitival	yes	no
Bare-Infinitival	no	yes

Towards a Solution

The introductory section of this paper showed that in the absence of an overt mention of the experiencer, the default interpretation of the attitude expressed by a DA is that it belongs to all discourse participants, while the interpretation of the attitude expressed by an AA is attributed to the speaker only. This suggests that a text-interpretation system will need to maintain independent registers of individual beliefs, or discourse commitments, of the distinct participants in the discourse being interpreted.

A modification of Gunlogson’s (2001) representation of the Common Ground (CG) used in conjunction with the Collaborative Principle (CP) (Walker and Whittaker 1990, Walker 1992) provides a basic model that includes information relevant to modeling discourse and accurately attributing attitudes to individuals. Walker’s CP is in (10).

- (10) Collaborative Principle: Conversants must provide evidence of a discrepancy in belief as soon as possible (Walker 1992:6).

This solution involves modeling the CG such that the distinct contributions of individuals in the discourse are represented separately. This modification of the standard Stalnakerian model allows the update effect of an utterance to be executed on a substructure of the context, what Gunlogson calls the Commitment Set (CS) of an individual participant, rather than a join of the beliefs held in common by the discourse participants. While one can be derived from the other, Gunlogson’s model facilitates the tracking of individual commitments, which is crucial to the accurate attribution of the attitudes expressed by different classes of proposition-modifying adjectives. The semantics of DAs requires a modification to the attitudes of all discourse participants, while in the case of AAs a modification needs be made only to the CS of the speaker.

In what might be called the “normal” case, illustrated by AAs, when a speaker utters (2), the semantics of *absurd* provide the instruction for the CG to be updated with the information that the speaker is committed to the proposition expressed by *it is absurd that Briscoe is a detective*. Unless the addressee overtly signals that she also is committed to the truth of this proposition (perhaps by uttering “*I agree*”, perhaps with a significant gesture or facial expression), this will be a commitment of the speaker alone.

The model of possible worlds under consideration includes w_1, w_2, w_3 and w_4 . Here odd numbered worlds are worlds in which it is in fact “absurd” that Briscoe is a detective, even worlds are worlds in which it is not “absurd” that Briscoe is a detective.

(11)	CS _A	CS _B
a. input context C:	{ w_1, w_2, w_3, w_4 }	{ w_1, w_2, w_3, w_4 }
b. C+A: “ <i>it is absurd that Briscoe is a detective</i> ”	{ w_1, w_3 }	{ w_1, w_2, w_3, w_4 }

(11) shows that initially, the commitment sets of both A and B include worlds where neither is committed to the absurdity of Briscoe’s

being a detective. After A’s utterance of *it is absurd that Briscoe is a detective*, the worlds in which it is not absurd that Briscoe is a detective, that is w_2 and w_4 , are eliminated from CS_A, but since B does not signal a shared belief in this proposition, CS_B includes worlds in which it both is and is not absurd that Briscoe is a detective – B is not committed one way or the other.

In contrast, the update effect of an utterance with the DA *clear* requires that the CG be updated with the information that both the speaker and the addressee are committed to designated proposition. This is a departure from Gunlogson’s original proposal, which did not allow utterances by a speaker to affect the individual commitments of the addressee. Walker’s CP is then invoked to ensure that an addressee has the opportunity to “approve” any incorrect adjustments to her commitment set that may arise as the result of a speaker’s conversational move.

To illustrate this, consider a set of possible worlds in (12). Due to the fact that assertions of clarity depend on belief, not on truth in a given world, as argued in Barker and Taranto (2003) and Taranto (2003), this model indicates the beliefs of A and B with respect to the proposition expressed by “d”, which stands for *Briscoe is a detective*. “BEL” is a relational operator that associates discourse participants with beliefs about a proposition; “BEL(A,d)” should be read “A believes that Briscoe is a detective”.

(12)	w_5 :	BEL(A,d); BEL(B,d)
	w_6 :	¬BEL(A,d); BEL(B,d)
	w_7 :	BEL(A,d); ¬BEL(B,d)
	w_8 :	¬BEL(A,d); ¬BEL(B,d)

(13)	CS _A	CS _B
a. input context C:	{ w_5, w_6, w_7, w_8 }	{ w_5, w_6, w_7, w_8 }
b. C+A: “ <i>it is clear that Briscoe is a detective</i> ”	{ w_5 }	{ w_5, w_6, w_7, w_8 }
c. no objection from B	{ w_5 }	{ w_5 }

The update effect modeled with a DA in (11) occurs in two stages. Initially, all worlds in which the interlocutors do not believe that Briscoe is a detective are removed from CS_A (11b). In the second stage (11c), following from Walker's CP, B's failure to immediately object to a discrepancy in beliefs effects a change in CS_B as well.

Ramifications of the Proposal

The data presented in this paper show that syntactic structure alone is an insufficient indicator of how to interpret implicit experiencers of proposition-modifying adjectives. The identification of the distinct classes of DAs and AAs is important to the exploration of attitude and affect in text, as it presents data that human language technology systems need to address. This fact leads to a deeper understanding of the types of subjective information that can be encoded in proposition-modifying adjectives.

The identification of the varying ways that implicit experiencers of proposition-modifying adjectives may be interpreted suggests further research in two main areas of computational linguistics. The first of these involves explicit models of the CG in a Discourse, as discussed above. The specific suggestion made in this paper is that discourse models need to include isolable sub-structures containing the discourse commitments of individual discourse participants, as suggested by Gunlogson (2001) in the formal linguistics literature. This move will allow text-analyzing systems to by default attribute the attitudes expressed by AAs to the speaker only, and to the addressee only in cases in which the addressee overtly signals a shared discourse commitment. In contrast, text-analyzing systems can be designed so that by default, the attitudes expressed by DAs are attributed to both the speaker and the addressee, unless an overt signal by the addressee suggests that the designated attitude is *not* a shared discourse commitment.

The second area of research in computational linguistics that the distinction between DAs and AAs informs involves the statistical distribution of the two adjective types. Since it is the case that DAs and AAs occur in partly overlapping, and partly distinct syntactic structures, statistical analysis of those structures in which only one type of adjective is licensed will likely provide information that can allow text-processing systems to accurately attribute attitudes to appropriate discourse entities.

Selected References

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