

Introduction. Factivity alternates in Turkish attitude reports: Factive/non-factive interpretations of an attitude verb are conditioned by the syntax of the embedded clause. Factivity alternations (FAs) are underdescribed and raise serious challenges for existing models of factive attitudes [1, 7, 11]. This paper focuses on the Turkish knowledge predicate *bil-*, describes and derives the alternation.

Contribution I: Empirical. There are “non-factive knowledge reports.” These minimally differ from *bona fide* knowledge reports in that the belief need not be true, and from plain belief reports in that the belief needs to be justified and *de re*. Natural language is sensitive to “justification.”

Contribution II: Theoretical. A unique denotation for *bil-* relates an eventuality-*res* and a belief. Non-factive knowledge reports are the result of an allowed mismatch between the description of the *res* in the evaluation world, and its description in doxastic alternatives (*cf. de re* belief about individuals [13, 3]). Factive reports are obtained by enforcing a truth condition on *de re* belief [9] *cf.* [6, 8, 14] in the composition between *bil-* and certain embedded clauses, instead of the lexicon.

Data I: The FA puzzle. Attitude reports (1) and (2) are both introduced by *bil-*. The syntax of the embedded clause differs. Composition with a nominalization (1) yields the (projecting) inference that the belief is true. Composition with a tensed *diye* clause (2) does not. The denial test (3) evidences the contrast, by conjoining (1) and (2) with the negation of the belief proposition.

Factive alternant:

Non-factive alternant:

Denial test

- (1) Su [kar yağ-dığını] **biliyo**. (2) Su [kar yağ-ıyo diye] **biliyo**. (3) Ama yağmur yağıyo.
 Su snow fall-NMZ knows Su snow fall-PRES *diye* knows ‘But it’s raining.’
 ‘Su **knows** it’s snowing.’ ‘Su **thinks** it’s snowing.’ #(1)&(3); ✓(2)&(3)

Some non-factive verbs (e.g., *düşün-*, ‘think’) compose with nominalizations and *diye* clauses, *but do not participate in the FA*, in particular, do not become factive with nominalizations. ⇒ The FA is due to an interaction between the lexical semantics of *bil-* and the two types of embedded clauses.

Data II: Justified *de re* belief. Non-factive knowledge is not reducible to “plain” belief: Contexts exist where plain belief reports are acceptable but non-factive knowledge ones are, crucially, not. Let C(contexts) 1, 2 and 3 have in common that it is raining and Su believes that it is snowing. In C1 (misleading evidence), her belief is motivated by a weather report that announces snow. In C2 (misinterpreted evidence), the weather report announces rain, but she mishears the rain forecast as snow, thus forming the belief that it is snowing. In C3, her belief is formed without external motivation, e.g., by guesswork. Plain belief reports are felicitous and true in all three contexts. The non-factive knowledge report (2) is felicitous and true in C1, unacceptable in C2 and C3.

| Context | (1) | (2) | <i>düşün-</i> ‘think’ | Comment |
|-----------------------------|-----|-----|-----------------------|-------------------------------------------------------|
| C1: Misleading evidence | # | ✓ | ✓ | ∃ <i>res</i> & proper acquaintance relation |
| C2: Misinterpreted evidence | # | # | ✓ | ∃ <i>res</i> & <u>im</u> proper acquaintance relation |
| C3: Guesswork | # | # | ✓ | no <i>res</i> /no acquaintance relation |

The pattern suggests that the felicity and truth of non-factive knowledge reports depends on the existence of a *res* (the raining event), and on proper acquaintance with it (the C1 weather report). The factive report (1) is infelicitous in all three contexts. An additional constraint on the felicity of a non-factive knowledge report is that the speaker must not believe that the attitude holder’s belief is true. Then, the factive alternant is preferred. Finally, the use of the non-factive alternant generates a pragmatic inference of speaker uncertainty or attitude holder mistake. This is reminiscent of anti-presupposition phenomena [12, 16, 4] and is captured by a competition between the alternants.

Proposal I: Independence of belief and res. In *de re* analyses of knowledge, the *res* and the belief proposition are recovered from the same object: The embedded proposition in [9], or a predicate in Frana’s [6] analysis of concealed questions. My proposal hinges on recovering the *res* and belief from distinct objects. Evidence is in (4): A mismatching *res* (expressed by the nominalization) and belief (by the *diye* clause) are realized together. Hence, *res* and belief are independent objects.

(4) Su [_{res} yağmur yağdığını] [_{belief} kar yağıyo diye] biliyo.
 Su rain fall.NMZ snow fall.PRES *diye* knows

‘Su believes of the raining event that it’s a snowing event.’ \rightsquigarrow There is a raining event.

In (2), the *res* is unpronounced, though present in the syntax/semantics. The *diye* clause determines belief content, though it cannot determine the *res* description. In (1), only the *res* appears to be surface-realized, by the nominalization. In fact, the belief is recovered from and matches the *res*.

Proposal II: Lexical entry The denotation of *bil-* is a relation between a *res*, belief content, and an attitude holder, in (5). The *res*, Φ , and belief content, Ψ , are recovered from predicates of eventualities (type $v(st)$), which nominalized and *diye* clauses are assumed to denote (*cf.* [11]).

(5) For all $w \in D_s$, $\Phi, \Psi \in D_{v(st)}$, $x \in D_e$

- a. $\llbracket \mathbf{bil} \rrbracket(w)(\Phi_{res})(\Psi_{belief})(x)$ defined iff $\exists e[\Phi(e)(w)]$ semantic presupposition
 b. $\llbracket \mathbf{bil} \rrbracket(w)(\Phi_{res})(\Psi_{belief})(x) = 1$ iff
 $\exists R_{acquaint.}[\iota e'[\Phi(e')(w)] = \iota e''[R(x, e'', w)] \wedge \text{DOX}_{x,w} \subseteq \{w' | \Psi(\iota e'''[R(x, e''', w)])(w')\}]$

The relation R is one of acquaintance, holding between the *res* and the attitude holder. The contrast between C1/C2 suggests that the choice of R is restricted: R must support knowledge acquisition.

Derivation I: The non-factive alternants. The definedness and truth conditions of (4) are in (6).

(6) $\llbracket (4) \rrbracket$ is defined iff it’s raining. (7) Denotations of *bil-*’s arguments in (4):

$\llbracket (4) \rrbracket = 1$ iff Su is acquainted with the raining e and believes of it that it’s a snowing e .
 $\llbracket \mathbf{yağmur yağdığını}_{res} \rrbracket = \lambda e \lambda w. rain(e)(w)$
 $\llbracket \mathbf{kar yağıyo diye}_{belief} \rrbracket = \lambda e \lambda w. snow(e)(w)$

The structure and truth conditions of the non-factive alternant (2) are similar to the ones for (4). In (2), the *res* is unpronounced. Two semantic strategies are available for recovering it. The *res* may be an existentially closed variable, or a referential pronoun (both of type $v(st)$). These options may help to capture differences in the epistemic state of a speaker uttering (2). They need not, for instance, believe that it is raining to utter (2) while being informative. Non-factive LFs are the result of potential mismatches between *res* description and belief, which definition (5) allows for.

Derivation II: The factive alternant. Definedness/truth conditions of (1) are in (8). Factivity is the result of matching *res* and belief ($\Phi = \Psi$). The *res* Φ , overtly realized by the nominalization, raises and binds the belief argument Ψ , (9).

(8) $\llbracket (1) \rrbracket$ is defined iff it’s raining.

$\llbracket (1) \rrbracket = 1$ iff Su is acquainted with the raining e and believes of it that it’s a raining e .

(9) $[\lambda w_0 [Su [\Phi [\lambda_8 [\Psi_8 [t_8 [bil-w_0]]]]]]]$

Locating factivity Existing accounts of factivity cannot account for FAs. Some accounts encode the factive inference in the lexical semantics of the attitude verb, spelling it out as a semantic presupposition or deriving it from lexical alternatives [2, 5, 15]. Inference cancelling devices are available to them, but not what is going on in Turkish. Other accounts posit factive complementizers and overgenerate (though see Korean factive ‘think’ in [11]) or make *ad hoc* distributional decisions [10, 7]. I locate factivity in the *composition* between cognitive semi-factives and certain clauses. Thus, the FA derived and empirical generalizations are respected. Why otherwise, can predicates like ‘think’ not be factivized, while predicates like ‘know’ are readily defactivized?

References

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