How do compositional semantics and conceptual structures interact? – A case-study on mental attitude adverbials

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Natural language interpretation is strikingly flexible in adhering to selectional restrictions. These phenomena – often labeled as coercion – challenge strict compositionality and thus raise intricate questions for the semantics-pragmatics interface. As a puzzling case in point, we will discuss German mental attitude adverbials (= MAAs) as *absichtlich* ('intentionally') and *freiwillig* ('voluntarily'). MAAs describe the attitude of the highest argument of the verbally introduced event (Wyner (1994), Frey (2003)), cf. (1):

(1)   a. Der Wanderer liegt absichtlich   im   Schatten.
          the hiker   lies   intentionally in the shadow

      b. Der Wanderer liegt freiwillig   im   Schatten.
          the hiker   lies   voluntarily in the shadow

In (2), however, the disjunct properties of things and attitude holders undermine a straightforward compositional integration of the explicit anchor argument. Strikingly, *absichtlich* (as *vorsorglich* ('preventively'), *versehentlich* ('inadvertently'), . . .) allows for solving the conflict by pragmatically inferring an attitude holder while with *freiwillig* (and *widerwillig* ('reluctantly'), *bereitwillig* ('willingly'), . . .) the interpretation crashes, cf. Buscher (2013).

(2)   a. Die Picknickdecke liegt absichtlich   im   Schatten.
          the picnic blanket lies   intentionally in the shadow

      b. *Die Picknickdecke liegt freiwillig   im   Schatten.
          the   picnic blanket lies   voluntarily in the shadow

What does allow the pragmatic identification of attitude holders in one group and disallow it in the other? Notably, two further observations challenge the pragmatics-semantics interface in crucial ways: first, the interpolation of an attitude holder does not affect the denotation of the highest-ranked verbal argument; cf. (2a): the blanket is lying in the shadow, not the attitude holder. Therefore, explicit quantification targets blankets leaving the amount of attitude holders undetermined, cf. (3). These locality effects are not trivial; they contrast sharply with famous metonymic examples as (4), cf. Nunberg (1995).

(3)   Alle Picknickdecken liegen absichtlich   im   Schatten.
      All picnic blankets lie   intentionally in the shadow

(4)   All ham sandwiches want to pay.

Second, the identification of attitude holders does not depend on static semantic information alone, but also on dynamic conceptual knowledge. This major challenge for an appropriate integration of conceptual knowledge into semantics proper is illustrated by (5). Patients are potential attitude holders, cf. (5a); in (5b), however, a conceptual conflict renders a compositional identification of the attitude holder implausible: usually, patients do not decide on their medical treatment; thus, the attitude holder is identified pragmatically with the doctor.

(5)   a. Der Patient berührt absichtlich   den Arzt.
          the patient touches intentionally the doctor

      b. Der Patient liegt absichtlich   auf der Intensivstation.
          the patient lies   intentionally in the intensive care

Based on Type Composition Logic as developed by Asher's (2011), this paper aims providing for a full-fledged compositional analysis of MAAs that captures the observed conceptual effects. According to Asher (2011), semantic terms come along with fine-grained typing information; this includes type presuppositions (captured by parameters π) that must be met by the terms' arguments during composition. If conflicts arise, lexical information – i.e., polymorphic types

that encode dependency relations between types – license adaptive operations. For *absichtlich*, we propose that the identification of attitude holders rests upon the unified lexical entry (6).

(6) $[\![absichtlich]\!]$
$= \lambda\mathfrak{P}\lambda\Psi\lambda e\lambda\pi.\mathfrak{P}(\pi)(e)(\Psi) \wedge \Psi(\pi)(\lambda y\lambda\pi'.\text{intentional}(e,y,\pi' * \text{ARG}_1{}^{intentional} : \text{EVTY} * \text{ARG}_2{}^{intentional} : \text{INT} - \iota\nu\tau(\text{HEAD}(\mathfrak{P}), \text{HEAD}(\Psi))))$

The second argument of *absichtlich* is assigned a subtype of attitude holders, namely one for initiators (s. Buscher (2013), building on Farkas (1988)). Notably, we propose that this argument may – besides the type INT – justify a polymorphic initiator type $\iota\nu\tau(\text{HEAD}(\mathfrak{P}), \text{HEAD}(\Psi))$ that encodes a dependency relation between initiators and the head types of the compositionally assigned variables $\mathfrak{P}$ and Ψ. For (1a), justification via Simple Type Accomodation succeeds: INT and the type ANIMATE for *hiker* have a common meet. For (2a), it fails because INT and the type THING for *blanket* are incompatible. However, the integration of the polymorphic type allows justification via Type Accomodation with generalized polymorphic types δ (see Asher (2011, 225)) yielding the revised logical form (7):

(7) $\lambda e : \text{EVTY}\lambda\pi\exists!d : \text{THING}\exists i : \iota\nu\tau(\text{EVTY}, \text{THING}).\text{blanket}(d,\pi)$
$\wedge \text{ in the shadow lie}(e,d,\pi) \wedge \text{intentional}(e,i,\pi) \wedge \phi_{\iota\nu\tau(\text{EVTY},\text{THING})}(i,e,d,\pi)$

That is, a new variable i for a mediating initiator is introduced that initiates the situation of the blanket's lying in the shadow. The merits of the proposal are as follows:

First, the logical form assigns the initiator the underspecified value ϕ; as desired, this renders its identification amenable to conceptual knowledge just in case a type conflict precludes a direct compositional identification with the subject.

Second, confirming Asher's hypothesis that type clashes are resolved locally, the proposed resolution process rightly preserves the denotation of the highest-ranked verbal argument. This captures the locality effects, namely: blankets are lying in the shadow, not initiators, s. (2a); the quantifier's domain is *not* affected by the repair, s. (3).

Third, the lexicalist proposal is well-equipped to handle the contrast to *freiwillig*, s. (2): in contradistinction to adverbials as *absichtlich*, adverbials as *freiwillig* must not justify a polymorphic initiator type and thus preclude the required repair strategy. This lexical restriction is independently motivated, cf. Buscher (2013): both groups require simultaneity of the denoted situation and the mental state, but while with *absichtlich* this constraint can be fullfilled in cases as (2) – one may be an initiator of situations one is no direct participant of –, it fails with *freiwillig* which does not select initiators but agents of the given situation. Hence, postulating a polymorphic type for agents – analogously to $\iota\nu\tau$ one might think of $\alpha\gamma(\text{HEAD}(\mathfrak{P}), \text{HEAD}(\Psi))$, to be resolved to the type $\alpha\gamma(\text{EVTY}, \text{THING})$ – would not yield a coherent interpretation: there are no agents of a situation where another agent, here the blanket, lies in the shadow.

Fourth, though rooted in the lexicon, typing information is also sensitive to dynamic conceptual knowledge. This feature paves the way for capturing examples as (5): conceptual knowledge assigns the type INT to the patient in (5a), but not in (5b). Therefore, (5b) yields a type conflict, analogously to (2a) above. This prohibits Simple Type Accomodation and yields a justification via a polymorphic initiator type and thus a pragmatic identification of the initiator.

To sum up: our case study shows how recalcitrant data at the semantics-pragmatics interface comply with compositionality if conceptual knowledge is adequately integrated.

References

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