

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

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Abstract This paper discusses German adverbials such as *absichtlich* ‘intentionally’ and *freiwillig* ‘voluntarily’ to gain deeper insights into the intricate interaction of compositional semantics and conceptual structures. The case study reveals the impact of conceptual knowledge on the adverbial’s interpretation and, moreover, how lexical semantics may curb the impact of conceptual knowledge. Based on the compositional interpretation of the adverbials, this paper argues against an underspecification analysis and proposes a coercion analysis spelled out in Asher’s (2011) Type Composition Logic.

Keywords: modification, compositionality, interpretational flexibility, meaning adjustment, coercion, underspecification, attitudes, attitudinal objects, tropes, event semantics

1 Introduction

The principle of compositionality has proven to be key to the combinatorial nature of linguistic meaning (e.g. Pagin & Westerståhl 2011). However, the conception of strict compositionality is challenged by an increasing amount of evidence that natural language interpretation is strikingly sensitive to conceptual structures and thus goes beyond a meaning construction purely based on grammar (e.g. Asher 2011): the interpretation of a complex expression may allow us to exploit information from context and world knowledge to adhere to the selectional restrictions of predicates. Relevant phenomena of meaning adjustments raise the question of how the reliable idea of compositionality can be reconciled with the impact of conceptual structures.

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As a case in point, I will discuss German mental attitude adverbials (= MAAs) such as *absichtlich* ‘intentionally’ and *freiwillig* ‘voluntarily’. Roughly, MAAs describe an attitude of an event participant towards the event (e.g. Wyner 1998). Hence, they require their compositional target to refer to an animate entity that is able to have attitudes. In (1), the hiker conforms to this restriction and is interpreted as the attitude holder. I refer to this reading as *compositional interpretation*.

- (1) a. Der Wanderer liegt absichtlich im Schatten.
 the hiker lies intentionally in.the shade
 b. Der Wanderer liegt freiwillig im Schatten.
 the hiker lies voluntarily in.the shade

In (2), *die Picknickdecke* ‘the picnic blanket’ does not comply with the selectional restrictions of the MAAs. The disjunct properties of inanimate artifacts and attitude holders undermine a straightforward compositional interpretation of (2).

- (2) a. Die Picknickdecke liegt absichtlich im Schatten.
 the picnic blanket lies intentionally in.the shade
 b. *Die Picknickdecke liegt freiwillig im Schatten.
 the picnic blanket lies voluntarily in.the shade

However, as already noted by Eckardt (2003: 264), Pittner (2004: 284, fn. 12) and Dowty (2007: 62, fn. 29), a suitable attitude holder can be inferred to adhere to the semantic requirements of *absichtlich* ‘intentionally’. In (2a), the intention is preferentially ascribed to the person who put the picnic blanket in the shade. I refer to this reading as the *adjusted interpretation* since it includes some meaning parts that are determined by conceptual knowledge. (2b) does not allow us to infer the attitude holder although conceptual knowledge would support the putative interpretation. As in (2a), it is just as plausible that the person who put the picnic blanket in the shade has the relevant will. The interpretation of (2b) fails since the semantic requirements of *freiwillig* ‘voluntarily’ could not be fulfilled, neither compositionally nor pragmatically. With regard to this contrast, this paper tackles three questions: (Q1) To what extent does compositionality actually determine the identification of the attitude holder? (Q2) How is the exploitation of conceptual knowledge licensed and restricted? (Q3) How can we account for the sensitivity to conceptual knowledge while preserving some version of compositionality?¹

¹ This phenomenon shows up in several languages. As indicated by native speakers, the outlined contrast also holds in Bulgarian, Croatian, Czech, Danish, Dutch, English, French, Hungarian, Italian, Polish, Russian, Slovenian, Spanish, Swedish and Turkish; see Buscher 2018 for translations. Although this issue will not be touched upon in this paper and a more thorough discussion of fine-grained differences between certain languages must be tackled, my proposal is applicable to other languages in general. Notably, the lexicalist perspective underlying my analysis is well equipped to capture fine-grained differences between languages.

How do compositional semantics and conceptual structures interact?

In contemporary linguistics, two approaches conceive of meaning adjustments as instances of underspecification or coercion. The first captures meaning adjustments by a semantic structure that is underspecified in parts and thus allows for a pragmatic specification of particular meaning components (e.g. Blutner 1998; Egg 2005; Dölling 2005). Semantic underspecification occurs because either the lexical semantics of an item leaves its target argument underspecified or the compositional combination of particular items is systematically accompanied by the insertion of an underspecified variable. The potential to exploit conceptual knowledge is thus built into the semantic structure in advance. In contrast, the coercion approach conceives of meaning adjustments as irregular reinterpretations that are triggered by semantic conflicts arising in incompatible meaning structures (e.g. Asher 2011; Pustejovsky 2011). The conflict is solved by a linguistic adaptation mechanism that paves the way for exploiting on conceptual knowledge to save the interpretation of the conflicting terms. The potential to adjust the meaning is thus added in individual cases that require for it. I use the term *meaning adjustment* in a rather neutral way without relating it a priori to a particular theoretical approach.

Section 2 outlines the compositional interpretation of MAAs. It shows that the identification of the attitude holder is not underspecified, but strictly determined in terms of composition, cf. (Q1). Section 3 collates the core traits of the adjusted interpretation and thereby reveals the factors that license and restrict the meaning adjustment of MAAs, cf. (Q2). Section 4 spells out a coercion analysis in terms of Asher's (2011) type composition logic, cf. (Q3).

2 Compositional interpretation of German mental attitude adverbials

2.1 Lexical semantics

Previous accounts analyzing the compositional interpretation of MAAs treat MAAs as a homogeneous class. Basically, MAAs are assumed to describe the attitude of an event participant towards the event introduced by the verbal predicate (e.g. Croft 1984; Wyner 1998; McKercher 2002; Schäfer 2005; Landman 2000). This assumption is too coarse-grained. If MAAs only described an attitude, the putative interpretation of (3) should be fine: it is plausible that the animate participant has an intention or a will according to which the event should occur.

- (3) a. *Der Astronom hat absichtlich / freiwillig einen Planeten entdeckt.
the astronomer has intentionally / voluntarily a planet discovered
b. *Der Lektor hat absichtlich / freiwillig einen Tippfehler bemerkt.
the editor has intentionally / voluntarily a typing.error noted
c. *Die Frau hat absichtlich / freiwillig ihr Baby geboren.
the woman has intentionally / voluntarily her baby given.birth

Based on the oddness of these data, Buscher (2013, 2018) argues for a more complex semantics of MAAs and shows that MAAs can be divided into two lexical subclasses. The lexical entry proposed for *absichtlich* ‘intentionally’ illustrates the first subtype, i.e. *intentional adverbials*. The lexical entry proposed for *freiwillig* ‘voluntarily’ illustrates the second subtype, i.e. *assimilative adverbials*.²

- (4) $\llbracket \text{absichtlich} \rrbracket =$ [preliminary version]
 $\lambda P \lambda x \lambda e \exists r \exists z \exists e'. P(e)(x) \wedge \text{intention}(r, z, x, \wedge P) \wedge \text{bearing}(z, x) \wedge$
 $\text{initiation}(e', x, e) \wedge \exists T [Q = P \wedge Q \in C \wedge [(T \subset C) <_{\text{intended}} Q]] / \tau(z) \supset \tau(e)$
- (5) $\llbracket \text{freiwillig} \rrbracket =$ [preliminary version]
 $\lambda P \lambda x \lambda e \exists r \exists z \exists e'. P(e)(x) \wedge \text{will}(r, z, x, \wedge P) \wedge \text{bearing}(z, x) \wedge$
 $\text{control}(e', x, e) \wedge \exists T [Q = P \wedge Q \in C \wedge [Q <_{\text{preferred}} (T \subset C)]] / \tau(z) \supset \tau(e)$

The implementation of attitudes in an event semantic approach is notoriously challenging. In (4) and (5), the attitudes are not captured via propositions for ontological reasons. Building on the idea of Attitudinal Objects (Moltmann 2013), Buscher (2018) argues that attitudes such as intentions and wills ontologically must be categorized as quasi-relational tropes, i.e. as concrete property manifestations in an individual. This classification complies with their crucial features (e.g. perceptibility, causal effects, internal structure, variability, restricted integration of individuals); in particular, with the notion that attitudes are anchored in time via the corresponding bearerhood. Hence, in (4) and (5), the attitude is captured by a quasi-relational trope r that is specified by the target x and the content P (e.g. intention r that x has the property P). Following Landman (2000), the scope of the intensional operator \wedge captures that MAAs create an opaque context for their content P but not for their target x as noted by Thomason & Stalnaker (1973). Building on the analysis of simple tropes sketched by Maienborn (2015), r is related to its bearer x via a Kimian state z .³ Thus, due to the bearing relation, x is defined as the attitude holder. Since the relations are added conjunctively, (4) and (5) capture that MAAs are veridical (cf. Landman 2000). Wyner (1994: 172) and Ernst (2002: 64) noted the interpretational restriction that the attitude holder must have the described attitude while the event proceeds. This restriction is captured by a presupposition (encoded by /): the time of e must be part of the time of z . That is, the state z of having an intention is anchored in time, not the intention r itself. The presupposition captures that the attitude may already exist before the described

² In the following, I will outline my core assumptions concerning the lexical semantics of MAAs, which provide the starting point for my analysis of the meaning adjustment. Due to space limits these assumptions cannot be motivated in detail; see Buscher 2018 for an in-depth discussion.

³ According to Maienborn (2005), abstract Kimian states (introduced by copula verbs) are exemplifications of a property at a bearer. In contrast to Davidsonian states, which comply with the ontological traits of events, Kimian states are only anchored in time, but not in space.

event actually proceeds; for instance, in (1a), the hiker may have the intention to lie in the shade before he actually lies in the shade.

Attitudes introduced by intentional adverbials (= I-adverbials, e.g. *absichtlich* ‘intentionally’, *vorsorglich* ‘precautionarily’, *bewusst* ‘consciously’) are inherently related to the goals of the attitude holder. Moreover, I-adverbials express that the event *e* was initiated by *x* (encoded by an initiation event *e'*). That is, following Farkas (1988), the attitude holder *x* is established as the initiator of *e*. The initiator corresponds to the individual who gave the decisive impetus to the event by making a relevant decision and in this sense, is responsible for the event. The focus sensitivity of I-adverbials is encoded by an interpretative constraint establishing semantic access to a set of alternatives for the property *P* (cf. Rooth 1992). It states that *P* is part of a set *C* of contextually relevant properties (see also Landman 2000) and *C* also includes an alternative *T* that is less intended than *P*. *C* and *T* are determined by focus structure and conceptual knowledge. In sum, based on (4), the compositional interpretation of (1a) can be paraphrased as ‘There is an event where the hiker lies in the shade. At the same time, there is a state in which the hiker who initiated the event has the intention that he has the property of lying in the shade whereby this property is more intended than a contextually relevant alternative.’ The alternative can be specified as, for instance, lying in the sun.⁴

Attitudes introduced by assimilative adverbials (= A-adverbials, e.g. *freiwillig* ‘voluntarily’, *bereitwillig* ‘willingly’, *widerwillig* ‘reluctantly’) are inherently related to the attitude holder’s willingness to participate in the event. Moreover, A-adverbials express that the event *e* was controlled by *x* (encoded by the control event *e'* adopted from Engelberg 2000). That is, the attitude holder *x* is established as the controller of *e*. The controller corresponds to the individual who controlled the beginning of the event by his own actions (cf. Engelberg 2000). The constraint capturing the focus sensitivity states that *P* is part of a set of contextually relevant properties and *C* also includes an alternative *T* that is more preferred than *P*. In sum, based on (5), (1b) can be paraphrased as ‘There is an event where the hiker lies in the shade. At the same time, there is a state in which the hiker who controlled the event has the will that he has the property of lying in the shade whereby this property is less preferred than a contextually relevant alternative.’

⁴ More precisely, I-adverbials must be divided into two subtypes (Buscher 2018): The first subtype (e.g. *absichtlich* ‘intentionally’, *vorsorglich* ‘precautionarily’) relates to the initiation of the occurrence of the event: the responsible individual that had the opportunity to give the decisive impetus to the occurrence of the event actually initiated the event. The second subtype (e.g. *versehentlich* ‘inadvertently’, *unabsichtlich* ‘unintentionally’) relates to the initiation of the avoidance of the event: roughly, the responsible individual that had the opportunity to avoid the event did not avoid it. Moreover, in contrast to the first subtype, the second subtype states that the contextually relevant alternative *T* was more intended than *P*. Both subtypes allow the meaning adjustment outlined in Section 1. Due to space limits, I focus on the first subtype. However, the proposed coercion analysis applies analogously to the second subtype.

Consequently, I-adverbials and A-adverbials require their compositional target x to be able to have attitudes and, moreover, to be the initiator or controller of the event. They select for an event that can be initiated or controlled. The examples in (3) are odd since the events do not comply with these restrictions. For example, a discovery is made accidentally; it cannot be initiated or controlled by x .⁵

The question whether an event is assumed to be initiated and/or controlled is not determined by the lexical semantics of the verb, but by conceptual knowledge (Engelberg 2000; Farkas 1988).⁶ For instance, a sentence like *The hiker is lying in the shade* is felicitous when the hiker decided to lie in the shade (= initiation) and lay down in the shade (= control), but it is also felicitous when the hiker fell asleep and lay in the shade due to the movement of the sun. Initiation and control do not necessarily correlate with agentivity, cf. (6a). Due to lexical semantics, *backen* ‘bake’ describes an agentive action. However, conceptual knowledge associated with (6a) reveals that the described event was not initiated by the sleepwalker; the sleepwalker was not able to decide to bake a cake. Thus, in contrast to (6b), a modification of this event by *absichtlich* ‘intentionally’ is odd. This contrast provides first evidence that the selectional restrictions of MAAs are sensitive to dynamic conceptual knowledge; see also (17), (18) and (28) below.

- (6) a. *Der Schlafwandler hat absichtlich einen Kirschkuchen gebacken.
 the sleepwalker has intentionally a cherry.pie baked
 b. Der Gastgeber hat absichtlich einen Kirschkuchen gebacken.
 the host has intentionally a cherry.pie baked

2.2 Compositional identification of the target argument

Previous accounts describe the compositional identification of the target argument in dependence on syntactic functions, thematic roles or argument hierarchy: the attitude holder corresponds to the subject (e.g. McConnell-Ginet 1982), the agent (e.g. Wyner 1998) or the highest ranked argument (e.g. Frey & Pittner 1998; Frey 2003). For German MAAs, these analyses must be refined:

- (7) a. dass ein Schüler versehentlich einschief
 that a student_{subject} inadvertently fell asleep
 b. dass einem Schüler versehentlich eine Information entging
 that a student_{indirect object} inadvertently a information_{subject} missed
 c. dass einem Lehrer versehentlich ein Schüler einschief
 that the teacher_{free dative} inadvertently a student_{subject} fell asleep

⁵ Wyner (1998) explains the oddness of examples like (3) by the assumption that the attitude holder is restricted to a volitional agent. This explanation does not hold for German, cf. (7).

⁶ Some verbs actually determine that the described event is initiated and/or controlled; cf. e.g. *ermorden* ‘murder’ in contrast to *töten* ‘kill’.

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German MAAs may relate to subjects, cf. (1), (6b), (7a), indirect objects, cf. (7b), and free datives, cf. (7c). Thus, they may relate to arguments corresponding to agents, cf. (6b), themes, cf. (1), and experiencers, cf. (7a), (7b), as well as to DPs lacking argument status, cf. (7c). Moreover, the contrast between (7a) and (7c) provides evidence that the target argument is not lexically underspecified. If the target were underspecified and identified by conceptual knowledge, it should be possible to interpret the student as the attitude holder in (7a) as well as in (7c). However, in (7c), only the teacher can be interpreted as the attitude holder. The identification of the attitude holder thus does not depend solely on conceptual knowledge, but is obviously determined by grammar: the compositional target of MAAs is identified with the next DP integrated above the adverbial, i.e. based on relative minimal c-command; see Buscher (2018) for details.⁷ Hence, the meaning adjustment of MAAs, (2a), is not based on lexically anchored underspecification.

2.3 Syntactic adjunction site

With regard to the compositional interpretation, Frey & Pittner (1998) and Frey (2003) have shown that German MAAs have a base position above the internal argument and below the highest argument of the main predicate, cf. (8). Buscher (2018) verifies this analysis for both subtypes by several empirical studies.⁸

- (8) dass [_{VP} [_{DP} der Wanderer] [_{V'} [_{AP} absichtlich] [_{V'} [_{PP} im Schatten] v_{liegt}]]]
(9) dass [_{VP} [_{DP} die Decke] [_{V'} [_{AP} absichtlich] [_{V'} [_{PP} im Schatten] v_{liegt}]]]

Eckardt (2003: 264f.) and Pittner (2004: 284, fn. 12) suggest that the meaning adjustment of MAAs correlates to a high adjunction site above the highest ranked argument. Based on this assumption, it could be explained by underspecification resulting from combinatorics: in the position above all verb arguments, the target argument cannot be identified with a DP integrated above the adverbial and thus remains underspecified. Accordingly, the availability of the meaning adjustment depends on the syntactic configuration and is predictable in terms of composition. However, the assumption that MAAs can be base-generated in a second, rather high position has not been verified (Buscher 2018): the results of well-established

⁷ The options of relating to free datives or the subject of an unaccusative verb are restricted by certain independent factors, as for example the various adjunction sites of free datives and the movement of the internal argument in a higher position, respectively; see Buscher (2018).

⁸ English MAAs are analyzed as sentence adverbials (e.g. Parsons 1990) and/or VP adverbials (e.g. Wyner 1994, 1998, Landman 2000). Although the grammatical traits of German and English MAAs overlap significantly, they do not match exactly. For instance, in contrast to English MAAs, German MAAs are not passive sensitive: independent of the adverbial's surface position, the agent is interpreted as the attitude holder, but not the subject referent, cf. (ii).

(ii) dass der Junge (bereitwillig) von dem Arzt (bereitwillig) untersucht wurde
that the boy (willingly) by the doctor (willingly) examined was

diagnostics (based on sentential negation, focus projection, existentially interpreted w-phrases, remnant topicalization), three questionnaire studies and an auditory study provide strong evidence that the meaning adjustment does not depend on a high base position or a high placement of the adverbial in the surface structure. Regardless of their interpretation, MAAs are integrated as V'-adjuncts, cf. (9).

In sum, the question whether the meaning adjustment of MAAs should be captured as instances of underspecification or coercion is not a question of theoretical preferences. The restrictions identified with regard to the compositional identification of the target and the syntactic integration of MAAs are incompatible with the assumption that the meaning adjustment is based on underspecification. For this reason, I propose a coercion analysis in Section 4. Previously, I will present some core observations that an appropriate analysis should strive to capture.

3 Core characteristics of the adjusted interpretation

3.1 Dependence on lexical items

The availability of the adjusted interpretation is quite restricted, cf. (10) and (11).

- (10) Die Picknickdecke liegt absichtlich / vorsorglich / bewusst im Schatten.
the picnic blanket lies intentionally / precautionarily / willfully in.the shade
- (11) *Die Picknickdecke liegt freiwillig / bereitwillig / widerwillig im Schatten.
the picnic blanket lies voluntarily / willingly / reluctantly in.the shade

As already mentioned, in (11), the adjusted interpretation is not precluded by conceptual implausibility. The (non-)availability of meaning adjustment thus must be rooted in the linguistic system. Based on the independently motivated subclassification of MAAs, it can be related to the subtypes: I-adverbials systematically permit a pragmatic identification of the attitude holder; A-adverbials adhere to a compositional interpretation. Regardless of plausibility, conceptual resources are not able to add further interpretation options that are not licensed by the adverbial.

3.2 Non-destructive and local operation

The meaning adjustment does not destroy the standard meaning of the involved predicates. In particular, the DP which is compositionally assigned to the adverbial keeps its lexically defined meaning: in (10), *die Picknickdecke* ‘the picnic blanket’ describes an inanimate artifact, but not an animate entity that is able to have attitudes. The denotation and thus the distribution of the DP is not affected by the meaning adjustment (diagnostics adopted from Asher 2011, 2015; Asher & Luo 2012): (i) The DP can be modified by adjectives describing physical properties of artifacts, but not by adjectives describing cognitive skills, cf. (12). (ii) The DP is

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compatible with verbs describing physical changes of inanimate artifacts, but not with verbs describing actions of animate entities, cf. (13). (iii) Explicit quantification targets the artifact: (14) describes how many blankets are lying in the shade and leaves the amount of attitude holders undetermined.

- (12) Die löchrige / *kluge Picknickdecke liegt absichtlich im Schatten.
the holey / smart picnic blanket lies intentionally in.the shade
- (13) Die Decke lag versehentlich in der Sonne und verblich / *schief ein.
the blanket lay inadvertently in the sun and faded / fell asleep
- (14) Alle / drei Picknickdecken liegen absichtlich im Schatten.
all / three picnic blankets lie intentionally in.the shade

The meaning adjustment operates locally and does not affect the overall composition. In particular, it does not disturb the computation of the target argument and the verbal predicate: in (10), the picnic blanket is lying in the shade, not the inferred attitude holder. Moreover, the interpretation of the attitude is not affected. The meaning adjustment preserves the DP which is compositionally assigned to the adverbial as the target of the attitude: the inferred attitude holder has the intention that the blanket (not he himself) has the property of lying in the shade. The DP is not shifted to the content of the attitude; it is thus interpreted extensionally:

- (15) a. Max sagt, dass die Picknickdecke absichtlich im Schatten liegt.
Max says that the picnic blanket intentionally in.the shade lies
- b. Die Picknickdecke ist Pias Geburtstagsgeschenk.
the picnic blanket is Pia's birthday present
- c. → Max sagt, dass Pias Geburtstagsgeschenk absichtlich im S. liegt.
Max says that Pia's birthday present intentionally in.the s. lies

Hence, the impact of conceptual knowledge is well restricted to certain parts: it only affects the interpretation of the initiation relation and the bearing relation.

3.3 Preservation of lexical restrictions

The meaning adjustment cannot overrule the meaning contribution of I-adverbials and the restrictions introduced by the lexical semantics of I-adverbials:

(i) The inferred attitude holder cannot be identified arbitrarily with any individual available in the context, but is restricted to the initiator of the event. In a context such as (16), (10) does not allow the interpretation that Paula is the attitude holder since she is not the initiator. Maria gave the decisive impetus to the lying of the picnic blanket and thus must be identified as the attitude holder.

- (16) [Context: on a hot summer day, Maria prepared a picnic in the park. When she had finished, Paula joined her and sat down on the picnic blanket.]

(ii) The event has to be initiated. Otherwise, cf. (17), the combination with an I-adverbial and thus a meaning adjustment is precluded for independent reasons. Again, the selectional restrictions of I-adverbials are sensitive to conceptual knowledge: if the context makes clear that the described event can be considered as initiated, cf. (18), modification by an I-adverbial is permitted and the meaning adjustment succeeds: the painter who was able to initiate the sinister appearance of the sky is identified as the attitude holder.

(17) [Context: two persons are talking about today's weather.]

*Der Himmel wirkt absichtlich sehr düster.
the sky appears intentionally very sinister

(18) [Context: C. D. Friedrich is talking about his painting *The monk by the sea.*]

Der Himmel wirkt absichtlich sehr düster.
the sky appears intentionally very sinister

Provided that the event can be conceptualized as initiated, the meaning adjustment may occur in sentences with verbs denoting both stative and dynamic events, cf. (19). The meaning adjustment does not depend on certain verb classes.

(19) a. Der Wecker hat vorsorglich um 6 Uhr geklingelt.
the alarm clock has precautionarily at 6 o'clock rung

b. Der Fußball hat versehentlich die Fensterscheibe zerbrochen.
the soccer.ball has inadvertently the window.pane broken

(iii) A plausible alternative that is less intended than the property described by V' must be available. (20a) is odd since apple trees are usually in gardens. Without further context information, no alternative to this standard case is plausible. In contrast, (20b) is fine since it is plausible that the tree's location in the front garden is more intended than, for example, an alternative location in the back garden.

(20) [Context: two neighbors are talking about their gardens.]

Der Apfelbaum steht absichtlich ... a. ?? im Garten. b. im Vorgarten.
the apple tree stands intentionally ... in.the garden in.the front garden

In sum, the restrictions introduced by the lexical semantics of I-adverbials determine the adapted interpretation just as the compositional interpretation.

3.4 Flexible identification of the attitude holder

The pragmatic identification of the initiator and thus of the attitude holder is determined by dynamic conceptual structures. World knowledge associated locally with an expression usually allows for a default specification. In (21), the information that it is Pia's blanket suggests that Pia is the initiator of the event since the owner usually decides what is going to happen to his blanket. In (10), due to

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the lack of detailed information, world knowledge only suggests that the initiator corresponds to the person who put the blanket into the shade. In a context as (22), this allows the inference that Maria is the initiator and thus the attitude holder.

- (21) Die Picknickdecke von Pia liegt absichtlich im Schatten.
the picnic blanket from Pia lies intentionally in.the shade
- (22) [Context: On a hot summer day, Maria prepared a picnic in the park. As always, she was afraid of getting sunburned.]

However, local default specifications can be overruled by rather global context information. In a context like (23), (21) requires the interpretation that Paula is the attitude holder since the context promotes the assumption that Paula decided where Pia's blanket should lie and thus is the initiator. In a context like (24), (10) requires the interpretation that Sue is the attitude holder since she instructed Maria to put the blanket into the shade and thus gave the decisive impetus to the event.

- (23) [On a hot summer day, Paula prepared a picnic in the park. As always, she was afraid that her daughter Pia would get sunburned.]
- (24) [On a hot summer day, Sue prepared a picnic in the park. She instructed her daughter Maria to put the picnic blanket in the shade.]

3.5 Semantic and conceptual trigger

The meaning adjustment can be triggered by semantic incompatibilities, see the example with the picnic blanket, but also by conceptual incompatibilities, cf. (25):

- (25) Der Patient liegt vorsorglich auf der Intensivstation.
the patient lies precautionarily on the intensive care unit

Der Patient 'the patient' denotes an entity that is able to have intentions and to initiate events in general. Based on lexical semantics, the DP fits with the selectional restrictions of I-adverbials and can serve as their compositional target, (26):

- (26) Der Patient verschweigt vorsorglich ein Symptom.
the patient conceals precautionarily a symptom

However, the initiator of an event is not necessarily an event participant (cf. Farkas 1988: 36). He also can give the decisive impetus to the event indirectly by instructing a participant. Therefore, in (25), conceptual knowledge can reveal that the patient is not the initiator: patients usually do not decide on their medical treatment; it is more plausible that the doctor is the initiator and decided to treat the patient in intensive care. This renders a compositional interpretation of (25) implausible and the meaning adjustment is triggered although the DP *der Patient* 'the patient' is semantically compatible with the adverbial. For this reason, examples like (27) are ambiguous and the global context determines whether the com-

positional interpretation or the adjusted interpretation is adequate.⁹ Against this background, (6a) actually allows the adjusted interpretation if the context reveals who was able to initiate the event by instructing the sleepwalker; cf. Sue in (28).

(27) Der Patient schluckt vorsorglich Vitamin C.
the patient swallows precautionarily vitamin C

(28) [Context: Sue is able to influence the actions of her sleepwalking husband.]

Sections 3 and 4 have revealed that the impact of conceptual knowledge is strictly restricted by the lexical semantics of I-adverbials. At the same time, fine-grained dynamic conceptual knowledge determines whether an event fulfills the requirement of an initiated event, and if so, which individual fulfills the requirement of an initiator. These observations call for a formal approach that integrates conceptual knowledge directly within a compositional set-up. Asher's (2011) type composition logic (= TCL) provides a suitable framework.

4 Modeling the meaning adjustment in a type-logical approach

In TCL, lexical entries specify to levels: in addition to standard intensions, they specify fine-grained typing information about terms and their variables. These include type presuppositions that correspond to the selectional restrictions of a predicate and must be justified by the types of the respective arguments in the course of composition. Type presuppositions are encoded within presupposition parameters π ; * symbolizes the amendment of π by a type presupposition:

(29) $\llbracket \text{der Wanderer} \rrbracket = \lambda O \lambda \pi''' \exists ! w. \text{hiker}(w, \pi''' * \text{ARG}_1^{\text{hiker}}: \text{HUMAN}) \wedge O(\pi''')(w)$

(30) $\llbracket \text{die Decke} \rrbracket = \lambda O \lambda \pi''' \exists ! w. \text{blanket}(d, \pi''' * \text{ARG}_1^{\text{blanket}}: \text{ARTIFACT}) \wedge O(\pi''')(d)$

(31) $\llbracket \text{im Schatten lieg} \rrbracket = \lambda \Phi \lambda e'' \lambda \pi'''. \Phi(\pi'' * \text{ARG}_1^{\text{itslie}}: \text{EVTY} * \text{ARG}_2^{\text{itslie}}: \text{PHYS-OBJ})$
($\lambda v \lambda \pi'''. \text{in the shade lie}(e'', v, \pi''')$)

In (29), the term presupposes an application on an entity that is a human; w justifies the type HUMAN just in case that w fulfills the conditions that our conceptual knowledge associates with this type (e.g. cognitive skills, a certain physical constitution). In (30), the individual going in for d is supposed to be of the type

⁹ In contrast, the controller is necessarily a participant of the event (cf. Engelberg 2000: 83). Hence, provided that the compositional target denotes an animate entity, the identification of the attitude holder can differ for I-adverbials and A-adverbials: in (iii), A-adverbials relate to the subject referent (= controller) and I-adverbials relate to an inferred initiator (dog owner, teacher).

- (iii) a. Der Hund läuft vorsorglich / widerwillig an der Leine.
the dog walks precautionarily / reluctantly on the leash
b. Die Schüler schreiben vorsorglich / freiwillig einen Vokabeltest.
the students write precautionarily / voluntarily a vocabulary test

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ARTIFACT. In (31), the first argument must justify the type EVENTUALITY (= EVTY) and the second argument must justify the type PHYSICAL OBJECT (= PHYS-OBJ).

A straightforward implementation of the outlined selectional restrictions of MAAs as type presuppositions leads to the lexical entries in (32) and (33).¹⁰

(32) [[absichtlich]] = $\lambda\mathfrak{P}\lambda\Psi\lambda e\lambda\pi.\mathfrak{P}(\pi)(e)(\Psi) \wedge \Psi(\pi * \text{ARG}_3^{\text{intention}}: \text{ENTITY} * \text{ARG}_2^{\text{bearing}}: \text{ATHA} * \text{ARG}_2^{\text{initiation}}: \text{INITIATOR} - \omega\tau(\text{HD}(\Psi)) * \text{ARG}_3^{\text{initiation}}: \text{CBI})$
 $(\lambda y\lambda\pi' \exists r:\text{ATT-OBJ} \exists z:\text{K-STATE} \exists e':\text{EVTY}. \text{intention}(r, z, y, \wedge\mathfrak{P}, \pi') \wedge \text{bearing}(z, y, \pi')$
 $\wedge \text{initiation}(e', y, e, \pi') \wedge \exists T [Q = P \wedge Q \in C \wedge [(T \subset C) <_{\text{intended}} Q]]) / \tau(z) \supset \tau(e)$

(33) [[freiwillig]] = $\lambda\mathfrak{P}\lambda\Psi\lambda e\lambda\pi.\mathfrak{P}(\pi)(e)(\Psi) \wedge \Psi(\pi * \text{ARG}_3^{\text{will}}: \text{ENTITY} * \text{ARG}_2^{\text{bearing}}: \text{ATHA} * \text{ARG}_2^{\text{control}}: \text{CONTROLLER} * \text{ARG}_3^{\text{control}}: \text{CBC})$
 $(\lambda y\lambda\pi' \exists r:\text{ATT-OBJ} \exists z:\text{K-STATE} \exists e':\text{EVTY}. \text{will}(r, z, y, \wedge\mathfrak{P}, \pi') \wedge \text{bearing}(z, y, \pi') \wedge$
 $\text{control}(e', y, e, \pi') \wedge \exists T [Q = P \wedge Q \in C \wedge [Q <_{\text{preferred}} (T \subset C)]) / \tau(z) \supset \tau(e)$

In (32), e must justify the type EVENTUALITY THAT CAN BE INITIATED (= CBI). x must justify three types: INITIATOR,¹¹ ENTITY THAT IS ABLE TO HAVE ATTITUDES (= ATHA) and ENTITY.¹² More precisely, the type presuppositions introduced by the initiation relation include a polymorphic initiator type $\omega\tau(\text{HD}(\Psi))$. It encodes that the type justification for the second argument can actually proceed in two ways: (i) If the compositional target provides a type that is compatible with INITIATOR, type justification is based on this type and proceeds directly via Simple Type Accommodation. (ii) If the compositional target does not provide a type that is compatible with INITIATOR, the polymorphic type allows type justification based on the polymorphic initiator type $\omega\tau(\text{HD}(\Psi))$, whose value is specified in dependence on the head type of the compositional target Ψ . Notably, the second option has to be licensed by a type conflict. Each type presupposition for x can be traced back to the corresponding relation. For example, the restriction that x must be an initiator depends on the initiation relation; it does not depend on the intention relation. This captures that the bearer of an intention does not correspond to an initiator in general (cf. *beabsichtigen* ‘intend’; a person who intends something has an intention but did not necessarily initiate an event). Moreover, r is typed as ATTITUDINAL OBJECT (= ATT-OBJ), z is typed as K-STATE and e' is typed as EVENTUALITY. These type presuppositions are already bound and thus do not have any impact on the success of the predication. In (33), e is supposed to be of type

¹⁰ Asher’s treatment of adverbial modification is different. In particular, in his account, verbs are not equipped with an event argument. Since this is not central to the case at hand, I adhere to the standard Davidsonian perspective that adverbials relate to events introduced by the verb.

¹¹ The notation of this type presupposition is abbreviated. More precisely, it must be captured by a depending type INITIATOR(HD(e)) since an initiator always relates to a particular event; i.e. the concept associated with an initiator depends on the concept associated with the initiated event. This captures that x is actually the initiator of the described event. Accordingly, the polymorphic type must be refined as INITIATOR(HD(e), HD(Ψ)). The same holds for CONTROLLER.

¹² This type presupposition is rather coarse-grained since an attitude can target any entity.

EVENTUALITY THAT CAN BE CONTROLLED (= CBC) and x must justify the types CONTROLLER, ENTITY THAT IS ABLE TO HAVE ATTITUDES (= ATHA) and ENTITY. Most importantly, the type presuppositions imposed by the control relation lack a polymorphic type and do not allow any flexibility in terms of type justification.

With regard to (1a), the standard composition proceeds smoothly. The application of (32) to (31) yields (34), and combining (34) and (29) yields (35).¹³

- (34) $\llbracket \text{absichtlich im Schatten lieg} \rrbracket = \lambda \Psi \lambda e \lambda \pi. \Psi(\pi * \text{ARG}_1^{\text{itslie}}: \text{EVTY} * \text{ARG}_2^{\text{itslie}}: \text{PHYS-OBJ} (\lambda v \lambda \pi''' \text{.in the shade lie}(e, v, \pi''')) \wedge \Psi(\pi * \text{ARG}_3^{\text{intention}}: \text{ENTITY} * \text{ARG}_2^{\text{bearing}}: \text{ATHA} * \text{ARG}_2^{\text{initiation}}: \text{INITIATOR} - \text{w}\tau(\text{HD}(\Psi)) * \text{ARG}_3^{\text{initiation}}: \text{CBI}) (\lambda y \lambda \pi' \exists r: \text{ATT-OBJ} \exists z: \text{K-STATE} \exists e': \text{EVTY. intention}(r, z, y, \wedge [\lambda v \lambda e'' \text{.in the shade lie}(e'', v)], \pi') \wedge \text{bearing}(z, y, \pi') \wedge \text{initiation}(e', y, e, \pi')) / \tau(z) \supset \tau(e)$
- (35) $\llbracket \text{der Wanderer absichtlich im Schatten lieg} \rrbracket = \lambda e \lambda \pi \exists ! w \exists r: \text{ATT-OBJ} \exists z: \text{K-STATE} \exists e': \text{EVTY. hiker}(w, \pi * \text{ARG}_1^{\text{itslie}}: \text{EVTY} * \text{ARG}_2^{\text{itslie}}: \text{PHYS-OBJ} * \text{ARG}_1^{\text{hiker}}: \text{HUMAN} * \text{ARG}_3^{\text{intention}}: \text{ENTITY} * \text{ARG}_2^{\text{bearing}}: \text{ATHA} * \text{ARG}_2^{\text{initiation}}: \text{INITIATOR} - \text{w}\tau(\text{HD}(\Psi)) * \text{ARG}_3^{\text{initiation}}: \text{CBI}) \wedge \text{in the shade lie}(e, w, \pi * \text{ARG}_1^{\text{itslie}}: \text{EVTY} * \text{ARG}_2^{\text{itslie}}: \text{PHYS-OBJ} \wedge \text{intention}(r, z, w, \wedge [\lambda v \lambda e'' \text{.in the shade lie}(e'', v)], \pi * \text{ARG}_3^{\text{intention}}: \text{ENTITY} * \text{ARG}_2^{\text{bearing}}: \text{ATHA} * \text{ARG}_2^{\text{initiation}}: \text{INITIATOR} - \text{w}\tau(\text{HD}(\Psi)) * \text{ARG}_3^{\text{initiation}}: \text{CBI}) \wedge \text{bearing}(z, w, \pi * \text{ARG}_3^{\text{intention}}: \text{ENTITY} * \text{ARG}_2^{\text{bearing}}: \text{ATHA} * \text{ARG}_2^{\text{initiation}}: \text{INITIATOR} - \text{w}\tau(\text{HD}(\Psi)) * \text{ARG}_3^{\text{initiation}}: \text{CBI}) \wedge \text{initiation}(e', w, e, \pi * \text{ARG}_3^{\text{intention}}: \text{ENTITY} * \text{ARG}_2^{\text{bearing}}: \text{ATHA} * \text{ARG}_2^{\text{initiation}}: \text{INITIATOR} - \text{w}\tau(\text{HD}(\Psi)) * \text{ARG}_3^{\text{initiation}}: \text{CBI}) / \tau(z) \supset \tau(e)$

Type presuppositions percolate as provided by λ -conversion of the parameters π ; the type presuppositions for a variable are accumulated. According to (35), w is supposed to justify five types: HUMAN, PHYSICAL OBJECT, INITIATOR, ENTITY THAT IS ABLE TO HAVE ATTITUDES and ENTITY. Based on a type hierarchy reflecting our conceptual knowledge, these types are compatible and can be justified by the same entity. Simple Type Accommodation is licensed; the type presuppositions are combined via a meet operation (Asher 2011: 117) into the most specific subtype INITIATOR. In the same way, the type presuppositions for e (EVTY and CBI) are unified into the most specific subtype EVENTUALITY THAT CAN BE INITIATED. Thus type justification succeeds for w and e . All type presuppositions can be bound; see the result in (36) after existential closure of the VP's referential event argument. In prose: 'There is an event e where the hiker w lies in the shade. At the same time, there is a state z in which the hiker w who initiated the event e has the intention r that he has the property of lying in the shade.'

- (36) $\lambda \pi \exists e: \text{CBI} \exists ! w: \text{INITIATOR} \exists r: \text{ATT-OBJ} \exists z: \text{K-STATE} \exists e': \text{EVTY. hiker}(w, \pi) \wedge \text{in the shade lie}(e, w, \pi) \wedge \text{initiation}(e', i, e, \pi) \wedge \text{intention}(r, z, w, \wedge [\lambda v \lambda e'' \text{.in the shade lie}(e'', v)], \pi) \wedge \text{bearing}(z, i, \pi) / \tau(z) \supset \tau(e)$

¹³ I simplify the computation by neglecting the interpretational constraint that captures the focus sensitivity. It could be easily included and would not affect the crucial points of the derivation.

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The derivation of (1b) proceeds analogously. Again, type justification proceeds successfully via Simple Type Accommodation yielding the result in (37).

$$(37) \lambda\pi \exists e:\text{CBC} \exists !w:\text{CONTROLLER} \exists r:\text{ATT-OBJ} \exists z:\text{K-STATE} \exists e':\text{EVTY}. \text{hiker}(w, \pi) \wedge \text{in the shade lie}(e, w, \pi) \wedge \text{control}(e', i, e, \pi) \wedge \text{will}(r, z, w, \wedge[\lambda v \lambda e''. \text{in the shade lie}(e'', v)], \pi) \wedge \text{bearing}(z, i, \pi) / \tau(z) \supset \tau(e)$$

In prose: ‘There is an event e where the hiker w lies in the shade. At the same time, there is a state z in which the hiker w who controlled the event e has the will r that he has the property of lying in the shade.’

With regard to (2a), standard composition proceeds in the same way as in (1a) and (1b). Based on (30), (31) and (32), the derivation yields the result in (38).

$$(38) \llbracket \text{die Picknickdecke absichtlich im Schatten lieg} \rrbracket = \lambda e \lambda \pi \exists !d \exists r:\text{ATT-OBJ} \exists z:\text{K-STATE} \exists e':\text{EVTY}. \text{blanket}(d, \pi * \text{ARG}_1^{\text{itslie}}:\text{EVTY} * \text{ARG}_2^{\text{itslie}}:\text{PHYS-OBJ} * \text{ARG}_1^{\text{blanket}}:\text{ARTIFACT} * \text{ARG}_3^{\text{intention}}:\text{ENTITY} * \text{ARG}_2^{\text{bearing}}:\text{ATHA} * \text{ARG}_2^{\text{initiation}}:\text{INITIATOR} - \text{w}\tau(\text{HD}(\Psi)) * \text{ARG}_3^{\text{initiation}}:\text{CBI}) \wedge \text{in the shade lie}(e, d, \pi * \text{ARG}_1^{\text{itslie}}:\text{EVTY} * \text{ARG}_2^{\text{itslie}}:\text{PHYS-OBJ} \wedge \text{intention}(r, z, d, \wedge[\lambda v \lambda e''. \text{in the shade lie}(e'', v)], \pi * \text{ARG}_3^{\text{intention}}:\text{ENTITY} * \text{ARG}_2^{\text{bearing}}:\text{ATHA} * \text{ARG}_2^{\text{initiation}}:\text{INITIATOR} - \text{w}\tau(\text{HD}(\Psi)) * \text{ARG}_3^{\text{initiation}}:\text{CBI}) \wedge \text{bearing}(z, d, \pi * \text{ARG}_3^{\text{intention}}:\text{ENTITY} * \text{ARG}_2^{\text{bearing}}:\text{ATHA} * \text{ARG}_2^{\text{initiation}}:\text{INITIATOR} - \text{w}\tau(\text{HD}(\Psi)) * \text{ARG}_3^{\text{intention}}:\text{CBI}) \wedge \text{initiation}(e', d, e, \pi * \text{ARG}_3^{\text{intention}}:\text{ENTITY} * \text{ARG}_2^{\text{bearing}}:\text{ATHA} * \text{ARG}_2^{\text{initiation}}:\text{INITIATOR} - \text{w}\tau(\text{HD}(\Psi)) * \text{ARG}_3^{\text{intention}}:\text{CBI}) / \tau(z) \supset \tau(e)$$

Now, d must justify the types ARTIFACT, PHYSICAL OBJECT, INITIATOR, ENTITY THAT IS ABLE TO HAVE ATTITUDES and ENTITY. Obviously, these demands cannot be fulfilled by the same entity. ARTIFACT, PHYSICAL OBJECT and ENTITY have a common meet and can be unified into the most specific subtype ARTIFACT. But ARTIFACT clashes with the residual types (cf. $\text{ARTIFACT} \sqcap \text{INITIATOR} \sqcap \text{ATHA} = \perp$). Simple Type Accommodation and thus type justification fails. In other words, the derivation results in a type mismatch since the type of the compositional target does not justify the types required by the bearing relation and the initiation relation. A similar type mismatch arises in (2b) since the type ARTIFACT clashes with the types CONTROLLER and ENTITY THAT IS ABLE TO HAVE ATTITUDES.

If types do not match, TCL provides two options: the composition may simply crash as in (2b). Alternatively, as in (2a), a lexically introduced polymorphic type may license Type Accommodation with generalized polymorphic types and thus adaptive operations that reconcile the type conflict, cf. (39) (cited from Asher 2011: 225). (39) allows for interpolating an appropriate D -functor that introduces a new variable that mediates between the conflicting terms.

$$(39) \frac{\phi(v, \pi), \pi \text{ carries } \text{ARG}_i^P:\delta(\alpha, \beta) * \text{ARG}_j^Q:\alpha/\beta, v \in \text{ARG}_i^P \cap \text{ARG}_j^Q}{D(\lambda \omega \lambda \pi_1 \phi(\omega, \pi_1))(\pi)(v)}$$

According to Asher (2011: 223), coercion occurs locally, i.e. not in the restrictor, but in the nuclear scope. Thus, the type presuppositions ARTIFACT, INITIATOR – $\omega\tau(\text{BLANKET})$ and ATHA are transferred to the conflicting meaning parts in the scope and only anchored in the bearing relation and initiation relation, cf. (40).

$$(40) \lambda e:\text{CBI} \lambda \pi \exists! d \exists r:\text{ATT-OBJ} \exists z:\text{K-STATE} \exists e':\text{EVTY}.\text{blanket}(d, \pi) \wedge \text{in the shade lie}(e, d, \pi) \wedge \text{intention}(r, z, d, \wedge[\lambda v \lambda e''. \text{in the shade lie}(e'', v)], \pi) \wedge \text{bearing}(z, d, \pi * \text{ARG}_1^{\text{blanket}}:\text{ARTIFACT} * \text{ARG}_2^{\text{bearing}}:\text{ATHA} * \text{ARG}_2^{\text{initiation}}:\text{INITIATOR} - \omega\tau(\text{BLANKET})) \wedge \text{initiation}(e', d, e, \pi * \text{ARG}_1^{\text{blanket}}:\text{ARTIFACT} * \text{ARG}_2^{\text{bearing}}:\text{ATHA} * \text{ARG}_2^{\text{initiation}}:\text{INITIATOR} - \omega\tau(\text{BLANKET}))$$

Now, the terms which host the type conflict undergo abstraction (Asher 2011: 224f.), (41).¹⁴ Then, an appropriate D -functor applies to the abstracted part, (42).

$$(41) \text{bearing}(z, d, \pi * \text{ARG}_1^{\text{blanket}}:\text{ARTIFACT} * \text{ARG}_2^{\text{bearing}}:\text{ATHA} * \text{ARG}_2^{\text{initiation}}:\text{INITIATOR} - \omega\tau(\text{BLANKET})) \wedge \text{initiation}(e', d, e, \pi * \text{ARG}_1^{\text{blanket}}:\text{ARTIFACT} * \text{ARG}_2^{\text{bearing}}:\text{ATHA} * \text{ARG}_2^{\text{initiation}}:\text{INITIATOR} - \omega\tau(\text{BLANKET})) \\ = [\lambda x \lambda \pi'. \text{bearing}(z, x, \pi') \wedge \text{initiation}(e', x, e, \pi')] (\pi * \text{ARG}_1^{\text{blanket}}:\text{ARTIFACT} * \text{ARG}_2^{\text{bearing}}:\text{ATHA} * \text{ARG}_2^{\text{initiation}}:\text{INITIATOR} - \omega\tau(\text{BLANKET})) (d) \\ (42) \lambda P \lambda v \lambda \pi'' \exists i:\omega\tau(\text{BLANKET}). P(\pi'')(i) \wedge \phi_{\omega\tau(\text{BLANKET})}(i, v, \pi'') [\lambda x \lambda \pi'. \text{bearing}(z, x, \pi') \wedge \text{initiation}(e', x, e, \pi')] = \lambda v \lambda \pi'' \exists i:\omega\tau(\text{BLANKET}). \text{bearing}(z, i, \pi'') \wedge \text{initiation}(e', i, e, \pi'') \wedge \phi_{\omega\tau(\text{BLANKET})}(i, v, \pi'')$$

The coercion functor introduces existential quantification over a new variable i and the interpolation of i is reflected by the introduction of an additional underspecified relation $\phi_{\omega\tau(\text{BLANKET})}(i, v, \pi'')$. Notably, i is typed as $\omega\tau(\text{BLANKET})$. That is, i corresponds to an initiator that is related to a blanket: i made a decision regarding the blanket and thus initiated an event including the blanket as participant. Thus, $\omega\tau(\text{BLANKET})$ captures the dependency relation between the required type INITIATOR and the given type BLANKET. As a result of this step, cf. (42), the bearing and initiation relations take the new variable i as their argument. Then, (42) is inserted into (41) and the result replaces the original term within (40), which yields the revised logical form in (43). The λ -conversion of v and π'' yields (44).

$$(43) \lambda e:\text{CBI} \lambda \pi \exists! d \exists r:\text{ATT-OBJ} \exists z:\text{K-STATE} \exists e':\text{EVTY}.\text{blanket}(d, \pi) \wedge \text{in the shade lie}(e, d, \pi) \wedge \text{intention}(r, z, d, \wedge[\lambda v \lambda e''. \text{in the shade lie}(e'', v)], \pi) \wedge [[\lambda v \lambda \pi'' \exists i:\omega\tau(\text{BLANKET}). \text{bearing}(z, i, \pi'') \wedge \text{initiation}(e', i, e, \pi'') \wedge \phi_{\omega\tau(\text{BLANKET})}(i, v, \pi'')]] (\pi * \text{ARG}_1^{\text{blanket}}:\text{ARTIFACT} * \text{ARG}_2^{\text{bearing}}:\text{ATHA} * \text{ARG}_2^{\text{initiation}}:\text{INITIATOR} - \omega\tau(\text{BLANKET})) (d)]$$

$$(44) \lambda e:\text{CBI} \lambda \pi \exists! d \exists r:\text{ATT-OBJ} \exists z:\text{K-STATE} \exists e':\text{EVTY}.\text{blanket}(d, \pi) \wedge \text{in the shade lie}(e, d, \pi) \wedge \text{intention}(r, z, d, \wedge[\lambda v \lambda e''. \text{in the shade lie}(e'', v)], \pi) \wedge [\exists i:\omega\tau(\text{BLANKET}). \text{bearing}(z, i,$$

¹⁴ As outlined, the attitude relation is not involved in the type conflict. Thus, the scope contains conflicting and non-conflicting terms. Asher (2011) does not specify any regularity for this case. Based on the assumption that type conflicts are solved locally and only conflicting terms undergo abstraction, the abstraction only affects the bearing relation and the initiation relation.

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$$\begin{aligned} & \pi * \text{ARG}_1^{\text{blanket}} : \text{ARTIFACT} * \text{ARG}_2^{\text{bearing}} : \text{ATHA} * \text{ARG}_2^{\text{initiation}} : \text{INITIATOR} - \text{w}\tau(\text{BLANKET})) \\ & \wedge \text{initiation}(e', i, e, \pi * \text{ARG}_1^{\text{blanket}} : \text{ARTIFACT} * \text{ARG}_2^{\text{bearing}} : \text{ATHA} * \text{ARG}_2^{\text{initiation}} : \\ & \text{INITIATOR} - \text{w}\tau(\text{BLANKET})) \wedge \phi_{\text{w}\tau(\text{BLANKET})}(i, d, \pi * \text{ARG}_1^{\text{blanket}} : \text{ARTIFACT} * \text{ARG}_2^{\text{bearing}} : \\ & \text{ATHA} * \text{ARG}_2^{\text{initiation}} : \text{INITIATOR} - \text{w}\tau(\text{BLANKET})) / \tau(z) \supset \tau(e) \end{aligned}$$

Most importantly, the variables for the conflicting terms now differ; cf. *d* for picnic blanket and *i* for the bearing and initiation relations. The type conflict is resolved since *d* must justify ARTIFACT, while *i* must justify INITIATOR and ENTITY THAT IS ABLE TO HAVE ATTITUDES. This renders type justification successful; all type presuppositions can be bound; see (45). In prose: ‘There is an event *e* where the blanket *d* lies in the shade. At the same time, there is a state *z* in which an underspecified initiator *i* who can make decisions regarding the picnic blanket *d* has the intention *r* that the picnic blanket *d* has the property of lying in the shade.’

$$(45) \lambda\pi \exists e:\text{CBI} \exists!d:\text{ARTIFACT} \exists i:\text{w}\tau(\text{BLANKET}) \exists r:\text{ATT-OBJ} \exists z:\text{K-STATE} \exists e':\text{EVTY}.$$

$$\text{blanket}(d, \pi) \wedge \text{in the shade lie}(e, d, \pi) \wedge \text{intention}(r, z, d, \wedge[\lambda v \lambda e''. \text{in the shade}$$

$$\text{lie}(e'', v)], \pi) \wedge \text{bearing}(z, i, \pi) \wedge \text{initiation}(e', i, e, \pi) \wedge \phi_{\text{w}\tau(\text{blanket})}(i, d, \pi) / \tau(z) \supset \tau(e)$$

The following merits of the proposed type-logical analysis are noteworthy:

(i) The type coercion does not specify the value of the interpolated variable; the logical form assigns the interpolated variable the underspecified value ϕ . This renders its identification amenable to conceptual knowledge. However, the variable is typed as $\text{w}\tau(\text{BLANKET})$. This captures that the pragmatic identification of the attitude holder is restricted to the initiator of the described event and preserves the semantic requirements of *absichtlich* ‘intentionally’. The type coercion does not overrule selectional restrictions, but enables a different way to implement them.

(ii) The coercion is spelled out as a non-destructive operation: the type conflict is solved by a variable that mediates between the incompatible terms. The coercion does not affect the type presuppositions associated with *d*; *d* must justify the original type presuppositions specified by *die Picknickdecke* ‘the picnic blanket’. This captures that the blanket is still interpreted as an inanimate artifact. Furthermore, the coercion adjust the computation of the conflicting terms locally. The introduced variable is existentially bound and is not passed on; the argument of the original target remains compositionally active. This captures the outlined locality effects. The analysis captures that the interpretation of the attitude is not adapted since its presuppositions do not conflict with those of the original target.

(iii) The analysis captures that the coercion can be triggered by semantically and conceptually based incompatibilities. In TCL, typing information is – though rooted in the lexicon – context-sensitive and thus dynamic: type justification depends on whether the corresponding entity going in for a variable can justify the presupposed type in a particular context. In general, a patient can justify the relevant types: HUMAN required by *der Patient* ‘the patient’ and INITIATOR required by I-adverbials have a common meet; no type conflict results from the lexically

introduced type presuppositions. This allows a straightforward compositional interpretation of the patient as the attitude holder, cf. (26). However, the conceptual knowledge associated with (25) suggests that the particular patient cannot be the initiator of the particular event. Thus, in (25), the patient cannot justify the type INITIATOR and a conceptually induced type conflict arises. This type conflict triggers the type coercion and is solved in the exact same way as described above.

(iv) The lexicalist approach is well equipped to handle the contrast between the subtypes: the coercion is conceived of as an additional interpretation option that is introduced by certain lexical items, namely I-adverbials. A-adverbials do not introduce a polymorphic type and thus do not allow type coercion.

However, the differing coercive potential anchored in the lexical entries of MAAs can be motivated by independent conceptual assumptions concerning attitudes (see Buscher 2018 for an in-depth discussion): as outlined above, the coercion cannot neglect lexical requirements of MAAs. Hence, it must adhere to the restriction that the attitude has to exist at the same time as the described event. The conceptual knowledge associated with attitudes relating to goals ensures that the adjusted interpretation complies with this restriction: an intention exists as long as the goal is not achieved and it ceases when the goal is achieved. In (22), Maria has the aim to avoid a sunburn while she puts the picnic blanket into the shade and, moreover, while the blanket lies in the shade. Hence, it is conceptually plausible that her intention that the picnic blanket has the property of lying in the shade exists at the same as the blanket's lying in the shade. In contrast, the conceptual knowledge associated with attitudes relating to participation does not ensure that the adjusted interpretation complies with this restriction: the will to participate in an event exists as long as the event proceeds and ceases when the event comes to an end. The will to participate in the event exists while Maria puts the picnic blanket into the shade, but it does not exist anymore while the blanket lies in the shade. Hence, in contrast to I-adverbials, A-adverbials lack an adequate conceptual backbone that is required for a successful implementation of coercion.

In sum, this case study revealed three main characteristics of the interaction between compositional semantics and conceptual structures: (i) Selectional restrictions are sensitive to fine-grained dynamic conceptual knowledge. Therefore, type coercion can be triggered by semantically induced type conflicts but also by conceptually based type conflicts. (ii) Lexical precondition: lexical information determines which meaning parts can be adjusted by conceptual knowledge; the lexical entry thus licenses and restricts conceptual influences. (iii) Conceptual precondition: lexical semantics cannot be overruled by conceptual knowledge, but is implemented more flexible; an adequate conceptual backbone must ensure that all semantic requirements can be considered as fulfilled. Hence, recalcitrant data at the semantics pragmatics interface comply with compositionality if conceptual knowledge is adequately integrated within a compositional framework.

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How do compositional semantics and conceptual structures interact?

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