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Wipe the table clean – German speakers construe telicity differently in adjectival resultatives and transitives

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Change of state expressions involving weak-endstate verbs such as *wipe* and *drink* exhibit variation in telicity. The present study is the first to experimentally investigate change of state expressions referred to as *adjectival control resultatives* (e.g., *wipe the table clean*) and the corresponding simple transitives (e.g., *wipe the table*) regarding their telicity readings. Based on their semantic properties, we ask whether German speakers interpret adjectival resultatives as telic and simple transitives as fluctuating between telic and atelic. Following an event-structural approach to telicity, we also seek to contribute to the issue of which event-semantic properties adjectival resultatives and simple transitives share: if it is the adjective that evokes a telic interpretation, then the possible telic interpretation of simple transitives must arise by different means, suggesting a non-uniform construal of telicity.

Twenty-one adults participated in a Truth-Value Judgment Task that varied Structure (resultative/transitive) and Event type (complete/incomplete). Generalized mixed effects logistic regression revealed a significant interaction between Event type and Structure. For complete events, acceptance was at ceiling for both structures. For incomplete events, acceptance was significantly lower for resultatives than for simple transitives. These results indicate that in adjectival resultatives telicity is construed semantically—via entailment—and in the corresponding simple transitives via a pragmatic inference, which is not computed very often. We propose that this type of simple transitives designates process events, exactly like their intransitive variant. Resultatives designate a transition event: the adjective and the main verb form a complex predicate; adjectives with closed scales like *clean* encode the prominent endstate subevent and the verb encodes the process subevent.

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1. Introduction

Verbal predicates designate events including states such as ‘be happy’ and actions such as ‘bark’, ‘find the key’, or ‘eat the cheese’, which all differ regarding their internal temporal make-up (e.g., Vendler 1957; Dowty 1979). Telicity is a property of verbs and verb phrases and characterizes the temporal contour of events: a verb or a verb phrase is telic if its meaning includes a specific moment toward which the event it describes naturally develops (Comrie 1976; Dowty 1979; Smith 1991; Verkuyl 1993; Klein 1994). Consider the contrast between *find* and *look for* in (1): *find the key* is a telic predicate and *look for the key* is an atelic predicate. The difference can be illustrated with the traditional temporal modifier test for telicity contrasts (Dowty 1979): *in an hour* combines with telic predicates, while *for an hour* combines with atelic predicates.

- (1) a. Mary found the key in an hour/*for an hour.
 b. Mary looked for the key *in an hour/for an hour.

When we apply the temporal modifier test to adjectival resultative predicates such as *wipe the table clean* (2a), we see that it is telic, as it combines with *in*-adverbials but not with *for*-adverbials. Notably, the corresponding structure in (2b) without the adjective is acceptable with both temporal adverbial phrases, indicating that both, an atelic and a telic reading are possible (Ehrich 1997). In this paper, we refer to the latter construction as *simple transitives*.

- (2) a. John wiped the table clean in an hour/*for an hour.
 b. John wiped the table in an hour/for an hour.

The present paper investigates how the telic interpretation is construed in sentences of the types in (2a) and (2b), i.e., how it arises from the lexical properties of the verb in interaction with other elements in the verb phrase. More specifically, we probe the role of adjectives such as *clean*, *dry*, *empty*, and *flat*, whose scales have a maximal value, regarding the construal of telicity, and we compare this to how telicity is construed if the adjective is absent. The puzzle is the following: if it is the adjective that evokes the telic interpretation in (2a), then the telic interpretation of the corresponding simple transitive in (2b) must come about by different means. These means may or may not be present in adjectival resultatives, depending on how similar we assume these two structures to be semantically and possibly syntactically.

Adjectival resultatives such as (2a) have been argued to provide support for a subeventual approach to telicity: they comprise two predicates, which denote two independent events. Within this account, the central questions are: how are these two subevents related, how do they conspire to determine the event type¹ of the complex event (Beavers 2012b; Williams 2015), and how is

¹ We are aware that the term *event type* (or *Aktionsart*) has ontologically a more narrow coverage than *eventuality type* (e.g., Filip 1999). In the present paper, we use the term *event type*, *sensu* Pustejovsky (1991), to refer to processes, states, and transitions (see Section 2.2).

telicity derived in simple transitives such as (2b), which comprise one predicate? To date, the analysis of these constructions has been mostly based on introspective judgements and corpus data, leaving open whether adjectival resultatives indeed obligatorily receive a telic interpretation and how prominent the telic interpretation is for the corresponding simple transitive. We contribute to these questions by providing controlled experimental data on the interpretation of minimal sentence pairs such as (2a) and (2b). Based on observations in the theoretical literature on resultatives and on previous experimental findings on related constructions we ask: do speakers of German assign a semantically telic interpretation to adjectival resultatives and a pragmatically telic interpretation to the corresponding simple transitives?

The paper is structured as follows: Section 2 provides the relevant theoretical background and summarizes the existing findings for adjectival resultatives and for telicity. Section 3 presents the newly developed Truth-Value Judgement Task, which assessed German speakers' interpretation of adjectival resultatives and the corresponding simple transitives. Section 4 discusses the experimental findings in relation to the theoretical issue of how telicity is construed in the two constructions and possible next steps in research. A conclusion is offered in Section 5.

2. Background

After sketching the relevant theoretical background regarding adjectival resultatives (Section 2.1) and telicity (Section 2.2), we summarize previous empirical findings on these topics with a focus on German, the language of our study (Section 2.3).

2.1 Adjectival resultatives

Resultatives such as (2a) are single clauses that consist of a primary predicate, i.e., the main verb (e.g., *wipe*), and a secondary predicate, i.e., the adjective (e.g., *clean*). The adjective denotes a state that holds of a participant in the event as a result of the action denoted by the verb (e.g., Rappaport Hovav & Levin 2001; Wechsler 2005; Beavers 2012b; Williams 2015). The participant in the event is referred to by the object DP (e.g., *the table*). Consequently, adjectival resultatives can be regarded as change of state expressions: they describe the change of a property applied to an affected argument from one state to a different state.

Resultatives differ from so-called depictive adjectival complex predicates, illustrated in (3). While the adjective in resultatives describes the result of the event, the adjective in depictives describes a state that holds of the affected argument during the event. The affected argument may be the subject DP, as shown in (3a), or the object DP, as shown in (3b), or it may be ambiguous between the subject and object, as shown in (3c) (see also Burkhardt et al. 2019).

- (3) a. Hans wisch-te den Tisch betrunken.
 John wipe-PST the.ACC table drunk
 ‘John wiped the table drunk.’
- b. Maria trank den Kaffee kalt.
 Mary drink.PST the.ACC coffee cold
 ‘Mary drank the coffee cold.’
- c. Maria küsst-te Hans betrunken.
 Mary kiss-PST John drunk
 ‘Mary kissed John drunk’

Resultatives and depictives also differ in that the set of adjectives participating in resultative constructions is small compared to the set of adjectives that can be used depictively (e.g., Boas 2000). Moreover, cross-linguistically the occurrence of adjectival resultatives is much more restricted: they are found in Germanic languages such as English and German, as well as in Hungarian, Latvian, Mandarin, and Persian, but not in Romance or Slavic languages (for a recent discussion see Haider 2018). Haider (2016; 2018) argues for a tight relation between the presence of adjectival resultatives and resultative particle verbs or serial verbs. More precisely, he predicts that “if a language makes available resultative complex verbal predicates (i.e., particle verbs or serial verbs), it thereby also makes available resultative adjective constructions, that is, complex verbal predicates with adjectives that receive a resultative interpretation” (Haider 2016: 2). Accordingly, languages like Mandarin that have serial verbs are predicted to allow resultative adjectives, just like Germanic languages that have particle verbs (see Maché 2022, for serial verb constructions in Benue-Kwa languages). Important for our analysis of adjectival resultatives (see Section 4), Haider (2016; 2018) proposes that the grammatical structure of resultative particle verbs and of resultative adjective constructions is the same. He argues for a complex predicate analysis (see also Neeleman & Van de Koot 2002, *a.o.*), in which an adjective is adjoined to the verb in a head-to-head adjunction structure, as illustrated in (4):²

- (4) Haider (2016: 5)
 [... [[X°] [V°]]_v ...]_{vp}; X° ∈ particle or adjective (or verb)

In the present paper we focus on resultative constructions with an adjective; note that results can also be expressed by a PP (e.g., *unter den Tisch trinken* ‘drink under the table’, example from Haider 2018) or by a DP (e.g., *paint the wall a shady blue*, see Beavers 2012b for an overview).

² We adopt the head analysis of adjectival resultatives because it reflects the parallel with resultative particles most closely. We are aware that alternative approaches exist, which either assume that the resultative adjective is an adjective phrase (e.g., Rappaport Hovav & Levin 2001) or assume that object DP and adjective constitute a small clause (e.g., Hoekstra 1988; Kratzer 2005; but cf. Haider 2016, for arguments against a small clause analysis).

Adjectival resultatives are typically classified into two subtypes, depending on whether the object undergoing the change is selected by the verb. If the object is not selected by the verb, the corresponding structure without the adjective is ungrammatical. This is shown by the contrast between (5a) and (5a') and between (5b) and (5b').

- (5) a. Der Hund bell-te sich heiser.
The.NOM dog bark-PST REFL hoarse
'The dog barked itself hoarse.'
- a'. *Der Hund bell-te sich.
The.NOM dog bark-PST REFL
'The dog barked itself.'
- b. Maria aß den Teller leer.
Mary eat.PST the.ACC plate empty
'Mary ate everything that was on the plate.', 'Mary emptied the plate.'
- b'. #Maria aß den Teller.
Mary eat.PST the.ACC plate
'Mary ate the plate.'

The verb *bellen* 'bark' in (5a/a') is intransitive, more precisely unergative, and does not select a second argument. Verbs such as *bellen* can be combined with an adjective only if a non-subcategorized argument is present, i.e., a reflexive pronoun that is coreferential with the subject. The verb *essen* 'eat' in (5b/b') can select a direct object, but the argument *den Teller* 'the plate' refers to the entity being emptied during the event of eating what is on the plate and not to the entity being eaten.

The predicates *freeze solid* (6a) and *wipe clean*, repeated here in its German version (6b), illustrate the other resultative subtype, referred to by Wechsler (2005) as *control resultatives*. The object is selected by the verb, and, unlike the resultatives in (5) (henceforth referred to as *non-control resultatives*), control resultatives allow omission of the adjective, as shown in (6a') and (6b').

- (6) a. The water froze solid.
a'. The water froze.
- b. Hans wisch-te den Tisch sauber.
John wipe-PST the.ACC table clean
'John wiped the table clean.'
- b'. Hans wisch-te den Tisch.
John wipe-PST the.ACC table
'John wiped the table.'

In (6a/a'), the verb is intransitive, more precisely unaccusative, and the adjective modifies the subject DP. In (6b/b'), the verb is transitive and the adjective modifies the direct object DP. Our experimental study investigates transitive adjectival control resultatives such as (6b) compared to simple transitives such as (6b'). In Section 2.2, we address the issue of telicity and of how the combination of verb and adjective conspire to achieve telicity, also in comparison to the variant without the adjective.

2.2 Telicity

Event structure constitutes one important aspect for the analysis of change of state expressions, in particular regarding their telicity readings (Demonte & McNally 2012; Rappaport Hovav 2014). Predicates like *find* are telic, because its meaning includes a specific moment toward which the event it describes naturally develops, referred to as a natural endpoint, while predicates such as *wipe*, which describe events that can continue indefinitely or can stop at any time, are atelic (Vendler 1957; Dowty 1979). In German, like other Germanic languages, the telicity of a predicate can arise from different sources: it is determined by the lexical semantics of individual verbs, sometimes in concert with other elements in the verb phrase. Inherently telic verbs such as *find*, *open*, and *arrive* lexicalize the natural endpoint as part of their meaning. In these cases, telicity is argued to be construed semantically, i.e., event culmination arises via entailment (Vendler 1957; Dowty 1979). This entailment is not cancellable, as illustrated in (7a). The traditional temporal adverbial modification test (Dowty 1979), illustrated in (1a), repeated here as (7b), yields the same result as the entailment test.³

- (7) a. Lisa found the key, #but it is still missing/it is not there.
 b. Lisa found the key in an hour/*for an hour.

Besides the lexical semantics of the verb, resultative verb particles, directional PPs, and the quantificational semantics of the object undergoing a change may contribute to the construal of telicity (van Hout 1998; Krifka 1998).⁴ Following Schulz (2018), we treat all these cases as instances of compositional telicity.⁵ For example, verbs such as *essen* 'eat' do not lexicalize

³ As pointed out by an anonymous reviewer, grammatical aspect plays an important role for whether a sentence entails culmination. Following van Hout (2018) telic predicates with perfective marking entail culmination of the event, whereas telic predicates with imperfective marking do not entail culmination of the event, see the contrast between (i) and (ii):

- (i) Lisa was opening the door. In fact, she is still opening it.
 (ii) Lisa opened the door. #In fact, she is still opening it.

The focus in this paper is on the ways in which the (a)telicity of verbs arises in interaction with other elements in the VP. Accordingly, we do not discuss grammatical aspect any further; in our own study we use perfective forms of the verbs (see Section 3.2.1).

⁴ For the contribution of the type of subject to telicity, see *i.a.* Demirdache & Martin (2015).

⁵ See van Hout (1998), for a further distinction between predicate and compositional telicity.

a natural endpoint; they are atelic. A telic reading of the predicate is achieved if these verbs combine with overt telicity markers. With resultative particles, this ensuing telic reading is obligatory, as exemplified in (8a). The particle verb construction (8a) entails the event culmination, whereas the counterpart without the verb particle does not carry any culmination entailment (8b). Note that, strictly speaking, the term *entailment* applies at the sentence level, i.e., in our case to sentences with a telic predicate with perfective marking (see footnote 3). In the remainder of the paper, verbs are always assumed to be in the perfective form. Accordingly, we use a shorthand to refer to telicity construal, stating that telicity may arise via entailment, either through the lexical properties of the verb or through overt markers such as resultative particles.

- (8) a. Maria aß auf, #aber es ist noch was übrig.
 Mary eat.PST up but it is still something left
 ‘*Mary ate up, #but there is still something left.’
- b. Lisa aß, aber es ist noch was übrig.
 Mary eat.PST but it is still something left
 ‘Mary ate, but there is still something left.’

Following Pustejovsky (1991; 1995), the event structure of a word constitutes one level of its semantic specification. In general, mereotopological approaches focus on eventualities and their parts by assuming basic event types and proposing mechanisms for how these basic event types can be combined to complex event types with an internal subevent structure (see also van Hout 1998; Williams 2015). Adopting a subeventual analysis for predicates, Pustejovsky (1991; 1995) postulates three event types: states (S), processes (P), and transitions (T) from one state to its opposition, including a process and a state subevent. The telicity of an event is related to the existence of a complex subevent structure consisting of a process and a state (see also Demonte & McNally 2012). Telic predicates like *eat up* or *open the door* designate transitions. For these predicates, the state subevent is marked as the head-of-event, indicating that it is semantically the most prominent subevent. Therefore, they are also referred to as *endstate-oriented transitions* (see Schulz et al. 2002).

Finally, the quantificational semantics of the direct object DP can affect the telicity of the predicate. Mereological approaches (Krifka 1998) model events and participants taking part in the event in terms of their part structure and a homomorphism between both. Combined with verbs of consumption (e.g., *eat*, *drink*), verbs of destruction (e.g., *burn*, *consume*) and verbs of creation (e.g., *build*, *compose*), a quantized object triggers a telic reading (9a/a’), whereas a non-quantized object (a mass term or bare plural) allows an atelic reading (9b/b’). Verbs like *sweep*, *iron*, *wash*, and *comb* behave similarly regarding this difference (Filip 2020).

- (9) a. He ate a piece of cake, #but left some of it.
 a'. He ate a piece of cake in ten minutes / */?for ten minutes.
 b. He ate cake, but left some of it.
 b'. He ate cake *in ten minutes / for ten minutes.

Whereas telicity in resultative particles arises through entailment, i.e., a hard, non-cancellable inference, the contribution of quantized DPs to telicity construal seems more flexible. The culmination inference can be cancelled, as illustrated with a specific definite DP and a verb of consumption in (10a) (from Hay et al. 1999: 139) and with a specific definite DP and a surface contact verb in (10b) (from Schulz 2018: 128).⁶

- (10) a. He ate the sandwich but as usual he left a few bites.
 b. Jill feg-te den Boden, aber er ist nicht sauber.
 Jill sweep-PST the.ACC floor but he is not clean
 'Jill swept the floor, but it is not clean.'

Therefore, it has been argued that in combination with certain verbs, specific definite DPs construe telicity pragmatically via a pragmatic inference (Talmy 1991; Brisson 1994; Jeschull 2007; Schulz 2018). Again, this is shorthand for stating that a VP with perfective marking triggers event culmination via a pragmatic inference. In line with this analysis, both an atelic and a telic reading are possible with *wipe*, as illustrated in (11):

- (11) a. Hans wisch-te den Tisch in fünf Minuten.
 John wipe-PST the.ACC table in five minutes
 b. Hans wisch-te den Tisch fünf Minuten lang.
 John wipe-PST the.ACC table five minutes long
 'John wiped the table in / for five minutes.'

As noted by Rothstein (2001), the minimal pair in (11) indicates a problem of the mereological approaches to telicity: "Unless we assume that the verb assigns two different thematic roles in each example [...], we need to ask why in the one case the quantized direct object determines a culmination point and in the other it doesn't" (Rothstein 2001: 142). This issue of ambiguity

⁶ Note that nevertheless, the verbs *fegen* 'sweep' and *eat* differ in several respects. The affectedness of the argument is not the same, as illustrated in (i) vs. (ii) (S. Engelberg p.c.):

- (i) She swept the floor, but it is still totally dirty.
 (ii) ??She ate the apple, but it still lies untouched on the plate.

In addition, for verbs like *sweep* we cannot assume uniqueness of events, i.e., we can sweep the floor and its sub-parts more than once, which is not possible for *eat*, since a given apple can be eaten only once (Filip 2020). Finally, *sweep* probably does not have an incremental location argument, while *eat* certainly has an incremental theme (L. McNally p.c.).

points to a general shortcoming of the mereological approach: telicity is regarded as a fixed concept, defined by quantization and the notions of homogeneity and cumulativity, without allowing for variation across different verb classes (van Hout 2018). Accordingly, this approach cannot easily capture the observation that so-called weak-endstate verbs such as *wipe*, *wash*, and *sweep*, combined with quantized direct objects, 'pragmatically favor' (Brisson 1994) a telic interpretation, but that there is no natural endpoint. Pustejovsky (1991; 1995) addresses this issue by assuming that predicates such as *wipe the table* designate a complex event of the type transition, with the most prominent subevent being the process and not the state. In our view, this event structure still leaves open how the telic and the atelic readings are achieved. The question is how we can capture the intuition that predicates of the type *wipe the table* seem to be ambiguous between atelic processes and telic transitions. We will return to this point in the discussion.

In addition to specific definite DPS, a specific verb class has been assumed to construe telicity via a pragmatic inference as well: degree achievement verbs such as *widen*, *lengthen*, *cool*, *straighten*, *dry*, and *clean* (Hay et al. 1999); this is illustrated in (12).

- (12) a. He cleaned the table, but not completely.
 b. He cleaned the table in 10 minutes / for 10 minutes.

According to Hay et al. (1999: 130), degree achievements "describe events that measure out the change an object undergoes with respect to the gradable property introduced by the base adjective". The bound of this measure of change can, for instance, be inferred from the scalar structure of the adjectival base. If a scale has a maximal value as is the case with *straight*, *clean* and *dry* (see Kennedy & McNally 2005), this value can serve as the result of the change, i.e., in our terms the endpoint. Although the most likely interpretation of the degree achievement predicate *clean the table*, for instance, may be telic, i.e., that the table is cleaned completely, the endpoint does not need to be reached, as illustrated in (12a) with the entailment test and by the outcome of the adverbial modification test in (12b).

Let us now turn to the question of how the telicity reading is achieved in adjectival resultatives. For the purposes of the present paper, we follow the assumption that adjectival resultatives share the syntax and semantics with resultative verb particles. Accordingly, telicity in resultative adjective constructions should arise via entailment and should not be cancellable. This seems to be borne out, as illustrated in (13a); an *in*-adverbial is permitted (13b), but a durational reading is excluded as predicted, see (13c).

- (13) a. Hans wisch-te den Tisch sauber #aber er ist nicht sauber.
 John wipe-PST the.ACC table clean but he is not clean
 'John wiped the table clean #but it is still not clean.'

- b. Hans wisch-te den Tisch in fünf Minuten sauber.
 John wipe-PST the.ACC table in five minutes clean
- c. *Hans wisch-te den Tisch fünf Minuten lang sauber.
 John wipe-PST the.ACC table five minutes long clean
 ‘John wiped the table clean in / *for five minutes.’

For now, we leave open which event-semantic properties the structures *wipe the table* (11) and *wipe the table clean* (13) may share, given the presence of a specific definite DP in both constructions and given the apparent ambiguity of the former but not the latter variant. We take up this question in the final discussion (Section 4).

2.3 Empirical studies on telicity

Telicity has been investigated experimentally across a number of languages. These studies aimed at shedding light on whether adults and children confirm the theoretical assumptions regarding the interaction of the verb and other elements in the sentence (e.g., Arunachalam & Kothari 2010; see van Hout 2018, for a cross-linguistic overview; Martin et al. 2020, for a cross-linguistic comparison). Several experimental studies on German probed the interpretation of inherently telic and atelic verbs as well as different telicity markers including resultative verb particles and quantized DPs (see Schulz 2018, for an overview). In these controlled experimental settings, studies typically used variants of the Truth-Value Judgement Task. In the following, we describe these studies in more detail and report the adult findings, because the design of our study used the same basic set-up. The test paradigms varied event type (incomplete vs. complete) and tested the acceptance of different event descriptions. The crucial condition in this paradigm is the incomplete event. Incompletion always involved a partial result, i.e., the event progressed up to a certain point and then stopped; the object was partially affected and had undergone some change (e.g., a box the lid of which was moved a little, a piece of cheese that was half-eaten). The rationale is the following: acceptance of a sentence as a description of an incomplete event points to an atelic interpretation, whereas its rejection points to a telic interpretation. That this experimental paradigm can reliably assess participants’ interpretation of different verb types has been shown by Schulz et al. (2001) and Penner et al. (2003), who found that the inherently telic verb *aufmachen* ‘open’ was accepted in only 5% of the cases for incomplete events. In a follow-up study, Schulz & Wittek (2003) tested a wider range of inherently telic particle verbs (*aufmachen* ‘open’, *zumachen* ‘close’, *abmachen* ‘take off’, *anmachen* ‘turn on’) as well as atelic verbs in intransitive constructions (*fegen* ‘sweep’, *wischen* ‘wipe’, *bürsten* ‘brush’, *pusten* ‘blow’, *malen* ‘draw’, *bauen* ‘build’, *puzzeln* ‘do a puzzle’, *schneiden* ‘cut’). As predicted, adults accepted the inherently telic verbs in only 3% of the cases for incomplete events, while the atelic verbs of surface contact, creation, and destruction were always accepted in this condition.

The studies by Schulz & Penner (2002) and Schulz & Ose (2008) are most important for our study (see Section 3). The authors examined the interpretation of verbs of consumption (*essen* ‘eat’, *trinken* ‘drink’) in transitive structures with a specific definite DP to probe the theoretical assumption that quantized objects trigger a telic reading. Adopting the design for Dutch and English by van Hout (1998) to German, Schulz & Penner (2002) compared quantized DP structures (e.g., *Hat das Mädchen den Apfel gegessen?* ‘Did the girl eat the apple?’) to intransitive structures (e.g., *Hat das Mädchen gegessen?* ‘Did the girl eat?’), and to resultative verb particle structures (e.g., *Hat das Mädchen aufgeessen?* ‘Did the girl eat up?’). Intransitive verbs were accepted for incomplete events in 97% of the cases, whereas resultative particle verbs were nearly always rejected (4% acceptance). Contrary to mereological approaches to telicity, transitive structures with a quantized DP were accepted in 52% of the incomplete-event conditions. A follow-up study by Schulz & Ose (2008) replicated this pattern: intransitives were always accepted for incomplete events, while resultative particle verbs were always rejected; again, quantized DPs were accepted in 73% of the cases. In a further condition, Schulz & Ose (2008) tested verbs of consumption with non-quantized DPs (bare nouns, e.g., *Käse* ‘cheese’); in line with mereological approaches, these constructions were always accepted for incomplete events.

Taken together, these experimental findings on German indicate that adding a resultative verb particle to atelic verbs of consumption results in a telic interpretation. Presence of a quantized DP triggers a telic interpretation only in some cases, in contrast to non-quantized DPs, which never result in a telic interpretation. The results across different predicate types (i.e., inherently telic verbs, atelic verbs, verbs of consumption with and without particle, with (non-)quantized DP) provide empirical evidence that construal of telicity may arise via entailment or via pragmatic inference. Notably, cross-linguistic findings support the observation that the interpretation of quantized DPs fluctuates between telic and atelic for adults (Arunachalam & Kothari 2010; van Hout 2018).

Experimental research on the interpretation of adjectival resultatives has mainly assessed whether speakers of German (adults and children) are sensitive to the selectional restrictions of adjectival resultatives (see Richter & van Hout 2013).⁷ Richter & van Hout (2013) created a metalinguistic task, in which participants heard sentences with resultative adjectives and had to indicate via word cards which noun the adjective belongs to. All children and all adults correctly opted for the object noun. Infelicitous structures (e.g., *The children watched the grandma red*) were rejected by the adults, whereas children took the adjective to belong to the object noun.

⁷ In a study on English, Wang et al. (2022) found that children and adults distinguished resultatives from depictives. Their task was to decide whether resultatives such as *Jim is painting the chair blue* matched a picture-supported story; the pictures matched a resultative interpretation, but not a depictive interpretation. However, the design did not address the question of whether the structures were interpreted as telic, because of the progressive tense used in all stimuli (see footnote 3).

This finding indicates that adults' interpretation shows sensitivity to the selectional properties of verbs. Due to the nature of the task, it leaves open whether participants assigned a telic reading to the test sentence.

To our knowledge, no study has tested the contrast between adjectival control resultatives such as *He wiped the table clean* and the corresponding simple transitive *He wiped the table* regarding their respective telicity interpretation. The only empirical evidence available concerns the related intransitive structures such as *Er fegte* 'He swept', suggesting an atelic interpretation (Schulz & Wittek 2003). Accordingly, at least two empirical issues are open: first, do German-speaking adults interpret adjectival resultatives indeed as telic, as expected if the parallel with resultative particles is on the right track? Second, are the simple transitive variants interpreted as fluctuating between telic and atelic? Our study assessed the telicity readings of both constructions.

3. Experimental study

Given the observations in the theoretical literature on resultatives and the previous experimental findings on related constructions presented in Section 2, we predict that speakers of German assign a semantically telic interpretation to resultatives and a pragmatically telic interpretation to the corresponding simple transitives. To test these predictions in a controlled setting, we developed a novel Truth-Value Judgment Task. The contrast regarding telicity was addressed by presenting resultatives and simple transitives as descriptions of either complete or incomplete events. Two important methodological considerations determined our choice of stimuli. First, parallel to previous studies on verbs of consumption, in all contexts in which the use of the adjectival resultative is felicitous, the structure without adjective is felicitous as well: *wipe the table clean* entails *wipe the table*, just like *eat the apple up* entails *eat the apple*. Incomplete events constitute the crucial condition because these could be described felicitously by simple transitives, but not by resultatives. Second, we tested only control resultatives, for instance *den Tisch sauber wischen* 'wipe the table clean' or *den Rock glatt bügeln* 'iron the skirt smooth', which are also felicitous without the adjective, because the object is selected by the verb. The two structures only differ in the presence of the adjective, allowing us to tease apart the contribution of the adjective to telicity construal. The subject and object DP were always the same for the two structures to control for the possible contributions of the arguments. This would not be possible with non-control resultatives like *den Teller leer essen* 'eat the plate empty' (Section 2.1) that do not have a corresponding grammatical simple transitive.

3.1 Participants

Twenty-one monolingual native speakers of German (age range = 20–35 years, mean age = 25 years, SD = 4 years) participated in the experiment. They had no background in linguistics and

were naive regarding the topic of the study. All participants gave informed written consent for their participation in the study.

3.2 Method

3.2.1 Materials

Our 2×2 design comprised the factors Structure (resultative/transitive) and Event type (complete/incomplete), resulting in four test conditions with four items each. In line with previous telicity studies (see Section 2.3), we employed the *yes/no*-question variant of the Truth-Value Judgment Task. The four weak-endstate verbs were *wischen* ‘wipe’, *bügeln* ‘iron’, *föhnen* ‘blow-dry’, and *trinken* ‘drink’ (i.e., verbs of surface contact and a verb of consumption). These verbs were chosen because they are easily depictable and because they license the addition of a respective gradable adjective, whose scale has a maximal value. The latter restriction was necessary to construct the adjectival resultative structures. This set-up resulted in the following complex predicates: *sauber wischen* ‘wipe clean’, *glatt bügeln* ‘iron smooth’, *leer trinken* ‘drink empty’,⁸ and *trocken föhnen* ‘blow-dry dry’. The main verb was always marked for present perfect.⁹ Five different object nouns, all realized as singular specific definite DPs, were used per verb (e.g., *den Tisch/den Boden/das Fenster/die Tafel/die Badewanne wischen* ‘wipe the table/the floor/the window/the blackboard/the bathtub’). For each adjectival resultative test sentence, a second structure was created without this adjective; see the example item set in (14).

- (14) a. Hat er den Tisch sauber ge-wisch-t?
 Has he the.ACC table clean PTCP-wipe-PTCP
 ‘Did he wipe the table clean?’
- b. Hat er den Tisch ge-wisch-t?
 Has he the.ACC table PTCP-wipe-PTCP
 ‘Did he wipe the table?’

⁸ Some speakers of German may find the resultatives with *trinken* ‘drink’ (e.g., *Sie trank den Saft leer* ‘She drank the juice empty’) less natural and may prefer substitution of the content with the container. A quick research in a German newspaper corpus (<https://www.dwds.de/d/korpora/public>) indicates, however, that these structures do occur. We found instances of *drink the champagne/the whiskey/the beer/the grappa empty*, see (i):

(i) Mit einer VIP-Karte können seine Gäste rund um die Uhr eine Edelküche besichtigen – und **den Champagner leer trinken**, wenn sie wollen. (Der Tagesspiegel, 12.09.2002)

‘With a VIP ticket, his guests can visit a fancy kitchen – and drink the champagne empty if they want.’

⁹ The data was collected in the State of Hesse (Germany), where the present perfect replaced the simple past (Fischer 2015). Accordingly, for the purposes of the present paper, the present perfect does not make an aspectual contribution different from the simple past; that also holds for the examples in Section 2.

Half of the actions were performed by a male character and half by a female character; personal pronouns (*sie* ‘she’ or *er* ‘he’) were used to refer to the subject. In total, there were five experimental lists, which were latin-squared and pseudo-randomized.

The test scenarios were presented in form of 15-second animated cartoons combined with a prototypical sound, e.g., the sound of wiping a cloth across a surface, to underscore the time course of the event. In complete events (**Figure 1a**), the affected object was shown as completely clean, smooth, empty, or dry, respectively. In incomplete events (**Figure 1b**), the affected object had undergone a partial change; for the item *wipe*, for instance, some spots of dirt were still visible when the event stopped. A full list of experimental items including the test sentences and stills of the animations is provided in Supplementary Material 1.

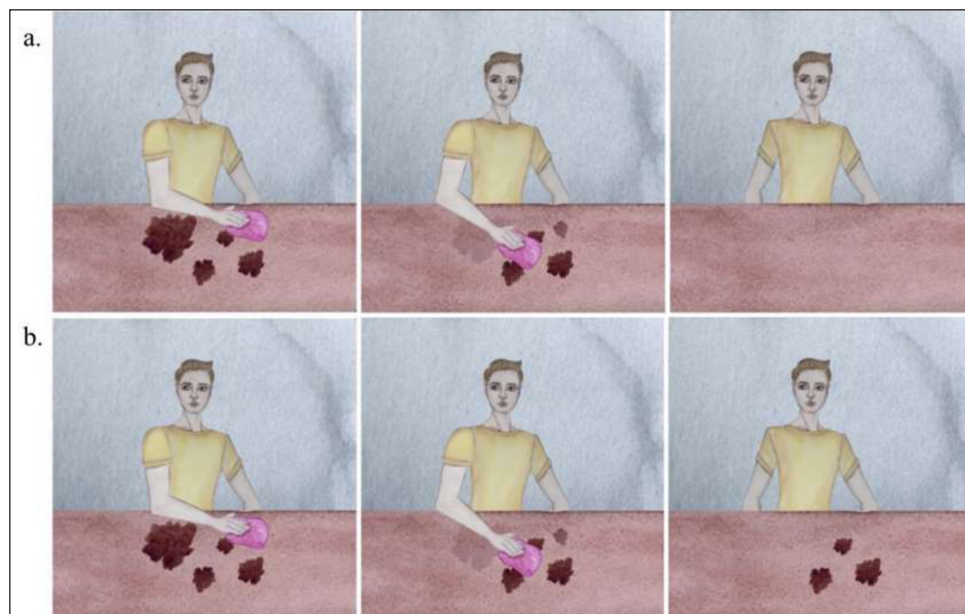


Figure 1: Example scenario as stills for complete events (a.) and for incomplete events (b.).

Six filler trials, which did not contain the target structures (e.g., *Hat der Mann ein Bügeleisen?* ‘Does the man have an iron?’), were added to the experimental trials. Recall that we expected a semantically telic interpretation for resultatives and a pragmatically telic interpretation for the simple transitives. These interpretations would be reflected in the behavioral data as follows: if resultatives (see 14a) are interpreted as entailing event culmination, they should be rejected (*no-answer*) when the depicted event is incomplete (see **Figure 1b**). If the corresponding simple transitives (see 14b) are interpreted as ‘pragmatically favoring’ event culmination, they should be rejected (*no-answer*) or accepted (*yes-answer*) for incomplete events for some participants and/or for some items (see Schulz & Penner 2002). Complete events (see **Figure 1a**) should

yield *yes*-responses for both structures. To counterbalance the uneven distribution of expected *yes*- and *no*- responses across the experiment, the filler questions were constructed to elicit four *no*-answers and two *yes*-answers.

An adjective pretest and two practice trials were administered before the main test. The practice items comprised two items from a different experimental list and served to familiarize the participants with the set-up of the test items using animation and sound. In the pretest, participants saw eight unanimated drawings and answered questions about the object properties described by the adjectives used in the main test (see **Figure 2**).



Figure 2: Example pretest item: *Ist das Geschirr sauber?* ‘Are the dishes clean?’.

The pretest assessed whether participants agreed with the depiction of the properties described by the adjectives. The objects used in the pretest were not used as object nouns in the main test and the participants did not receive any response-contingent feedback.

3.2.2 Procedure

Due to the COVID-19 restrictions at the time of testing, all participants were tested via video call software; they were alone in a quiet room. The experimenter explained that participants would see pictures and short videos and answer *yes/no*-questions about them. Pictures and animations were embedded in a presentation software and were presented via the screen sharing option of the video call software. Then the experimenter asked the test question; see (14) for an example question and Supplementary Material 1 for the full item set. Participants’ responses were audio-

recorded and transcribed after testing. Each session started with the adjective pretest, followed by the practice phase, which also provided the opportunity to check the sound quality; then the test phase was administered.

3.3 Results

The analysis of participants' answers for the pretest and filler items is reported in Section 3.3.1, and the analysis of participants' answers for the experimental items is reported in Section 3.3.2.

3.3.1 Pretest and filler items

Performance on the pretest was 95.8% accuracy. Seven answers were incorrect, which were due to one item where the depiction of a container as being empty was unclear. Performance on the filler items was at ceiling (100% correct).

3.3.2 Experimental items

Participants' answers were classified as *yes*- or *no*-responses. For the following analyses, we used the number of *yes*-answers as the dependent variable. For each of the four conditions, a total of 84 responses was analyzed. The proportion of *yes*-responses per condition is shown in **Figure 3**; the width of the violin plots varies by the density of data points in a specific region. For complete events, the violins look the same because the number of *yes*-answers is identical for both constructions (Mean = 98.8%, SD = 10.9%). For incomplete events, the number of *yes*-answers is higher for transitive structures (Mean = 71.4%, SD = 45.4%) than for adjectival resultatives (Mean = 9.5%, SD = 29.5%). The wide part of the violin for the resultatives indicates that *yes*-answers were rarely given. In contrast, the violin for the transitive structures points to a more balanced distribution of *yes*-answers, but with more *yes*- than *no*-answers.

The results were analyzed with generalized mixed effects logistic regression (1 = *yes*, 0 = *no*). We used the *glmer* function in the *lme4* package (Bates et al. 2015) in R (R Core Team 2022). The response data were fitted to a model using maximum-likelihood estimation (Laplace Approximation). Event type (complete, incomplete) and Structure (resultative, transitive) were entered as fixed effects, using contrast coding and 'incomplete' and 'resultative' as the reference levels, with a random intercept for Participant and Item. The model revealed a significant effect of structure ($\beta = 1.0597$, $Z = -2.112$, $p = .03$), a significant effect of event type ($\beta = 1.2149$, $Z = -5.188$, $p < .001$), and a significant interaction of structure and event type ($\beta = 2.1193$, $Z = -2.112$, $p = .03$). The interaction of structure and event type was further inspected via pairwise comparisons with Tukey adjustment (*emmeans* package, Lenth 2022), revealing a significant difference between the structures for incomplete events ($p = .001$), but not for complete events ($p = 1.000$).

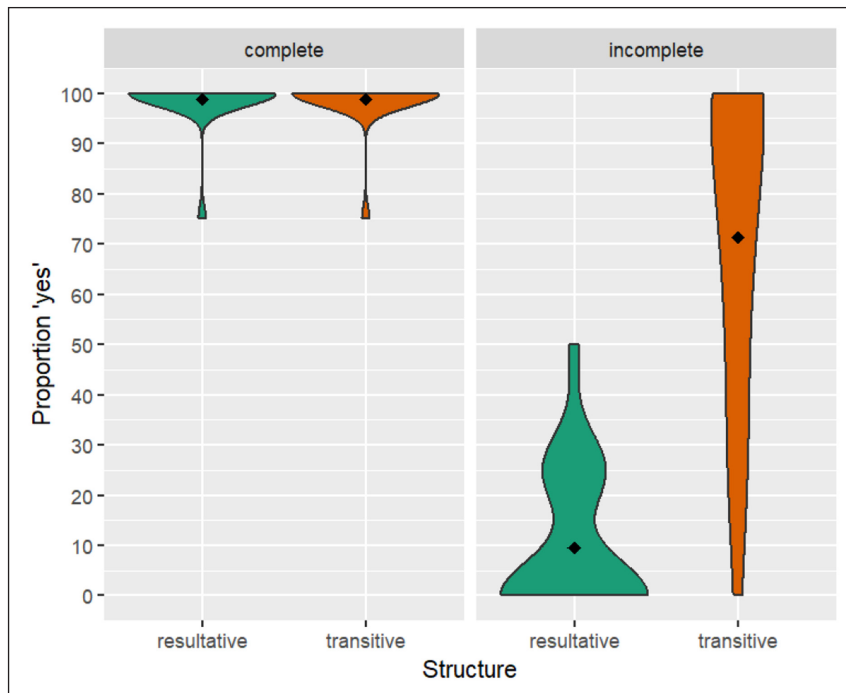


Figure 3: Violin plots depicting *yes*-responses (in %) by sentence structure and by event type (left and right panel). The black diamond indicates the mean.

To inspect whether there was variation across the verbs in the incomplete event condition, we analyzed the number of *yes*-responses for each verb separately. Given our design, the proportion of *yes*-responses equals the number of participants giving this answer. As can be seen in **Table 1**, the 9.5% cases of acceptance for adjectival resultatives were basically due to one verb, *trocknen föhnen* ‘blow-dry dry’, which was accepted in a third of the cases. Variation across verbs was much higher for simple transitives, with acceptance rates ranging between 52% and 95%.

In a next step, we examined the source of variation for the transitives in the incomplete condition, analyzing the responses to each verb within and across participants. Nine of the participants interpreted all transitives as atelic and a further five participants interpreted three transitives as atelic. Three participants interpreted two transitives as atelic and three interpreted one transitive as atelic. Notably, only one participant interpreted all transitives as telic. Interpretations as telic or atelic were not tied to specific verbs (see Supplementary Material 2 for a detailed list).

In summary, the participants predominantly rejected the adjectival resultatives with incomplete events (90.5% *no*-answers). Transitive sentences with the same verb but without the adjective were often accepted for incomplete events (71.4% *yes*-answers), with variation across and within participants.

Verb	Structure			
	Resultative		Transitive	
	Raw number	%	Raw number	%
<i>Trinken</i> ‘drink’	0	0	11	52
<i>Bügeln</i> ‘iron’	0	0	14	67
<i>Wischen</i> ‘wipe’	1	5	15	71
<i>Föhnen</i> ‘blow-dry’	7	33	20	95

Table 1: Number of *yes*-responses for incomplete events per verb and structure.

4. Discussion

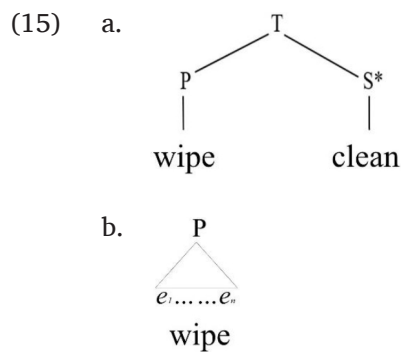
Using a controlled experimental setting, our study investigated whether adult speakers of German distinguish adjectival resultatives such as *wipe the table clean* and simple transitive predicates such as *wipe the table* regarding the telicity of the predicates. Participants had to accept or reject adjectival resultatives and the corresponding simple transitive for complete and incomplete events, which were shown via animated cartoons. In the following, we discuss our findings for both constructions in turn. We connect them to a mereotopological view of events (see McNally 2022) and ask which (if any) event-semantic properties simple transitives and adjectival resultatives construed with weak-endstate verbs share, given that the former but not the latter allow an atelic and a telic reading. We begin with adjectival resultatives in Section 4.1 and turn to the simple transitives in Section 4.2. Section 4.3 identifies steps for further research.

4.1 Construal of telicity in adjectival resultatives

Recall that incomplete events constituted the crucial condition in our experiment. In this condition, the participants predominantly rejected the adjectival resultatives (90.5% *no*-answers) indicating a telic interpretation. A by-item and by-participant analysis revealed that the rare cases of acceptance were mostly due to a single predicate: *trocken föhnen* ‘blow-dry dry’. It could be that this response results from an imprecise interpretation of *dry*: that is, in everyday life, it may be sufficient to blow-dry something until it is nearly dry (see Syrett et al. 2010, for imprecise interpretations of *full*). As pointed out by an anonymous reviewer, however, the same reasoning could also be applied to the other predicates. Alternatively, it may be that the animated cartoons, although carefully designed, did not depict the remaining wetness of the objects clearly enough. For now, we leave this issue open and abstract away from this exception.

In the following, we model the telic interpretation of adjectival resultatives within a mereotopological approach (Pustejovsky 1995; Williams 2015; McNally 2022), assuming that

telicity results from the existence of a complex subevent structure, which consists of a process and a result state. Consider the resultative *den Tisch sauber wischen* ‘wipe the table clean’. The two subevents are realized overtly: the verb describes the process and the adjective specifies the event description by making the dimension and, in particular, the result of the change explicit (e.g., Baglini & Kennedy 2019).¹⁰ This is the same analysis as has been suggested for particle verbs such as *aufessen* ‘eat up’ (Schulz et al. 2001). According to Pustejovsky’s analysis, the verb is underlyingly specified with an event type of process, which does not entail culmination. The adjective *clean*, a stage-level predicate, is underlyingly specified with an event type of state; more precisely, it is a function from processes to transitions (Pustejovsky 1991; 1995). The adjective induces an event-type shift from a process to a transition, whose most prominent subevent (head-of-event) is the state, illustrated in (15a) with the asterisk marking the head; this endstate-oriented transition entails culmination (see also van Hout 1998). We will address the role of the quantized DP in Section 4.2.



According to this analysis, *wipe* and *wipe clean* differ in that the predicates designate different event types: *wipe* designates a process (15b), i.e., a sequence of events identifying the same semantic expression, whereas *wipe clean* designates a transition (15a), i.e., an event identifying a semantic expression, which is evaluated relative to its opposition (Pustejovsky 1991). Accordingly, the “systematic ambiguity is the result of principles of semantic composition, rather than an underlying lexical ambiguity in the verb involved” (Pustejovsky 1991: 64).

A further argument for the complex subevent structure of *wipe clean*, comprising a process and a state, comes from adverbial modification. According to Williams (2015), adverbs such as *rapidly* (e.g., *He very rapidly wiped the table clean*) can modify the process event as well as the transition from a process to a state: the result may be reached rapidly, even when the wiping process is slow, and the result may be reached slowly, even when the wiping process is rapid.

¹⁰ Other languages encode both, process and result/state as verbs (see Maché 2022).

This shows that the event designated by the resultative construction cannot be reduced to a single process event.

The different subevent structures for *wipe* and *wipe clean* are analogous to the contrast between simple verbs and their particle verb variant (e.g., *wipe* – *wipe off*); the culmination inference arises via entailment and cannot be cancelled.¹¹ Moreover, unlike *wipe*, predicates such as *wipe off* and *wipe clean* designate transitions from one state to its opposition. Accordingly, the utterance *He wiped the table clean/off* is infelicitous if the affected object was clean already; *wipe clean* requires a change of state, while *wipe* does not carry such requirement (Levin & Rappaport Hovav 1991). Put differently, we cannot *wipe* a clean table *clean*.¹²

4.2 Construal of telicity in simple transitives

In contrast to the findings for adjectival resultatives, the findings for the simple transitives suggest an ambiguity: while simple transitives were frequently accepted (71.4% *yes*-answers) as descriptions of incomplete events indicating an atelic interpretation, in some cases simple transitives were rejected (28.6% *no*-answers), indicating a telic interpretation. This group data is mirrored by the inter- and intraindividual variation across participants, which we address below. In our view, these results are compatible with at least two accounts. According to the first, simple transitive structures are ambiguous between atelic processes and telic endstate-oriented transitions. The latter reading comes about by an event-type shift from a process event designated by *wipe* to a telic transition. The assumption that surface contact verbs like *wipe* and *sweep* in intransitive frames designate an atelic process event has been supported by empirical studies showing that they are always accepted for incomplete events (Schulz & Wittek 2003, see Section 2.3). This would mean that the ambiguity of predicates of the type *wipe the table* is located at the level of the semantic composition (see Schulz & Penner 2002, for a similar proposal for *eat the apple*). Notably, the event structure signaling telicity, derived via event-type shift, was chosen less frequently in the current study. The second account assumes that simple transitive structures designate a process event; event culmination is derived via a pragmatic inference, which is realized at a level different from the event-semantic representation. Accordingly, the apparent ambiguity found in our study exists because the telicity inference is computed only in some cases. A point in favor of the latter account concerns the predictions regarding the

¹¹ We are aware that resultatives with bare nouns have been argued to show that the adjective does not guarantee a telic reading (e.g., *John hammered metal flat*, from Wechsler 2005, or *Sam wiped furniture clean*, from Levin & Sells 2009). In our view, it is not clear that the German equivalent is felicitous (*?Sam hämmerte Metall flach*) and that it would be interpreted as atelic. Notably, resultative verb particles do not seem to permit an atelic reading of the analogous structure (e.g., *?John trank Saft aus*, ‘John drank juice up’). We leave this point for future empirical studies.

¹² This property is typically captured at the lexical conceptual level (Pustejovsky 1991, *a.o.*).

initial state of the respective events. Recall that adjectival resultatives like *wipe the table clean* are infelicitous if the affected object exhibits the endpoint at the outset of the event, i.e., if a change of state (regarding the relevant dimension, here: cleanliness) is not possible. If in their telic reading, adjectival resultatives and the corresponding simple transitive had the same event structure, i.e., an endstate-oriented transition, *wipe the table* should be as infelicitous as *wipe the table clean* if the affected object was clean at the outset of the event. This is contrary to our intuition and also rejected by previous analyses of verbs of surface contact (Levin & Rappaport Hovav 1991). In short, it seems that while we can *wipe* a clean table, we cannot *wipe* a clean table *clean*. Future empirical research is needed to investigate this assumption more systematically.

What does our analysis imply for the role of the quantized DP in simple transitives containing weak-endstate verbs? As mentioned in Section 2.2, telicity of simple transitives has been related to the structural properties of the direct object DP (Krifka 1998). While this mereological approach regards telicity as a fixed notion defined via the quantization and the notion of homogeneity, empirical research has shown that specific definite DPs selected by verbs of surface contact or consumption may or may not trigger a telic reading (Section 2.3). Our findings provide further evidence for the fluctuation of the telicity reading across verbs and across participants, which we argue indicates that the telic reading is derived via pragmatic inference. In our study, transitive *trinken* ‘drink’ (a verb of consumption) was treated as atelic in 52% of the cases, confirming earlier findings by Schulz & Penner (2002) and Schulz & Ose (2008) for the verb of consumption *essen* ‘eat’ (52 to 73% atelic readings). Within the class of surface contact verbs, we found variation: two verbs (*wischen* ‘wipe’, *bügeln* ‘iron’), in combination with a specific definite DP, were interpreted as atelic in roughly two thirds of the cases, while the verb *föhnen* ‘blow-dry’ was interpreted as atelic in almost all instances. Almost half of the adults treated all four verbs in the transitive structure as atelic, while only one adult interpreted all four verbs as telic.

In summary, adjectival resultatives and the corresponding simple transitives have a different event structure. The adjective, on a par with verb particles, builds a complex predicate with the main weak-endstate verb. The resulting event structure is represented as a transition, and construal of telicity arises via entailment. In contrast, the corresponding simple transitives are represented as a process event; construal of telicity arises via pragmatic inference and is subject to variation across participants and verbs.

4.3 Next steps

In the present paper we have taken a subeventual rather than a mereological approach to telicity. The subeventual account acknowledges the presence of lexical restrictions (Pustejovsky 1991; 1995; Williams 2015), but it does not incorporate the properties of the adjectives licensed in resultatives (i.e., the adjective must be gradable and must have a closed scale with a maximal

value, see Section 2.1). Mereological approaches, in contrast, can account for the role of the scale structure in the construal of telicity (e.g., Wechsler 2005; Beavers 2012a), as they model telicity as connected to a change along a path or a scale that is homomorphic to the event. As noted by Wechsler (2005), the two approaches are not mutually exclusive (see also Demonte & McNally 2012). We leave for future research how the two approaches could be integrated.

Second, it is unclear how telicity construal and change of state are related in case of degree achievements such as *clean the table*. Do they pattern with *wipe the table clean* or with *wipe the table*? There seem to be differences between the three structures regarding the initial state and regarding acceptance for incomplete events. Suppose the table in question is clean: in this case, we can *wipe the table*, but we cannot *clean the table*, just as we cannot *wipe the table clean*. Regarding the outcome, let us imagine a table with some dirt: after we have *wiped the table*, the degree of dirt may remain unchanged, but after we have *cleaned the table*, the degree of dirt must have decreased, although the table may still have some spots of dirt. That would mean that the verb *clean* shares with transitive *wipe* telicity construal via pragmatic inference but differs from transitive *wipe* regarding the state at the outset of the event (i.e., the change of state property). Empirical research is needed to see whether our intuitions are borne out.

Third, our study focused on control resultatives, where the verb selects the object DP. Control resultatives have a grammatical transitive counterpart without the adjective, which allowed us to examine the contribution of the adjective. But it is open whether adults assign an obligatorily telic reading also to non-control resultatives, which do not license a simple transitive structure (e.g., *den Teller leer essen* ‘eat the plate empty’ vs. **den Teller essen* ‘eat the plate’). Fourth, we turn to the parallel we argue holds for verb particles and resultative adjectives. Cross-linguistic research is needed to examine whether all languages that have verb particles (or serial verbs) and resultative adjectives pattern like German and whether they can be analyzed along the lines proposed here. Fifth, we left open where exactly in the grammar the event composition of *wischen* ‘wipe’ as a process and *sauber* ‘clean’ as an endstate is reflected, in the lexicon, the syntax or the morphology (see Ramchand 2008, for a syntactic proposal). Finally, we argued that telicity in the corresponding simple transitives is construed pragmatically. Future research is necessary to investigate whether this holds across different experimental settings.

5. Conclusion

The present paper is the first to experimentally investigate the event structure of adjectival control resultatives like *wipe the table clean* and the corresponding simple transitives with a specific definite direct object DP like *wipe the table* in German. Employing a newly developed Truth-Value Judgment task, we examined the construal of telicity via gradable adjectives whose

scales have a maximal value (*clean, dry, smooth, empty*) in comparison to the corresponding structures without adjective. Our findings show that adult speakers of German interpret adjectival resultatives as obligatorily telic, whereas simple transitives are interpreted as telic in only 29% of the cases, with variation across verbs and across participants. This response pattern indicates that telicity in adjectival resultatives is construed semantically, i.e., via entailment. Regarding telicity in the corresponding simple transitives, we argued that it is construed pragmatically, i.e., via a pragmatic inference, which is not computed very often. Following an event-structural approach to telicity, we propose that simple transitive constructions with weak-endstate verbs designate process events, just like their intransitive variants. In resultatives, the adjective and the main verb form a complex predicate, which is specified as a transition. The closed-scale adjective encodes the endstate subevent. This is parallel to what has been assumed for resultative verb particles and follows from Haider's (2016; 2018) proposal that verb particles and adjectives share the same syntactic analysis. Cross-linguistic studies are needed to examine whether this parallel holds true for all languages that follow the pattern of German.

Abbreviations

NOM = nominative, ACC = accusative, PST = past, PTCP = participle, REFL = reflexive, PP = prepositional phrase, DP = determiner phrase, VP = verb phrase

Data availability

Supplementary material 1 ‘Experimental items’, Supplementary material 2 ‘By-participant analysis’, Supplementary material 3 ‘R code’, raw data, example animation; available at https://osf.io/wsyrrh/?view_only=8a2b84e497aa4e5fb486df7b9e941b39

Ethics and consent

This study was approved by the Research Ethics Board of DIPF Leibniz Institute for Research and Information in Education (no. DIPF_EK_2021_30). Informed consent was obtained from each participant. All research data has been anonymized.

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Competing interests

The authors have no competing interest to declare.

Authors’ contributions

LHR contributed the conception of the study and was responsible for testing the participants and managing data compilation. MW and PS wrote Sections “Introduction”, “Background”, and “Discussion”. MW and LHR wrote the Section “Material and Methods”. MW performed the statistical analysis and wrote the Section “Results”. MW and PS contributed to manuscript revision of the text. All authors read and approved the submitted version.

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