55. Adverbial clauses

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Abstract

Adverbial clauses are subordinate clauses that modify their superordinate clauses. This modification can occur at various levels (such as verb phrase, tense phrase, mood phrase) and in various dimensions (such as times and worlds) and ways. These variations give rise to a categorization of adverbial clauses (temporal, modal, ...) and a subcategorization according to a range of relations within these dimensions, depending on the subjunction. Thus within the modal category it is customary to distinguish between causal, conditional, purpose, result, and concessive clauses. Sometimes the subjunction does not seem to encode much meaning of its own and the clause acts more like a relative clause, modifying a quantificational adverb or a modal, or specifying an underspecified predicate; sometimes, when there is no subjunction (“free” adjunct clauses), the contribution of the clause is underspecified.

1. Introduction

Adverbial clauses are a proper subclass of the class of all adverbials. To a considerable extent, this subclass relation distributes over the major semantic categories of adverbials commonly identified (see article 54 (Maienborn & Schäfer) Adverbs and adverbials). Thus in the temporal category, there are closely comparable clausal and nonclausal adverbials, e.g.: “since Benitez arrived at Anfield” - “since June 2004”. Locative adverbials and manner adverbials tend to be nonclausal, but instrumental adverbials can be both: “by hammering it” - “with a hammer”. In the modal category, clausal adverbials predominate; there are no close counterparts to conditional or causal clauses in the form of (nonanaphoric) adverbs or prepositional phrases.

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In the typical case, the clause consists of a subjunction $S$ and a tensed sentence $T$. If $S$ is temporal, $T$ can be assumed to denote a set of times, and $S$ can be ascribed the type $((\text{it}) ((\text{it})t))$, where $i$ is the type of times. If $S$ is modal, its argument will be a proposition and its type will be $((\text{st}) ((\text{st})t))$. Modal and temporal subjunctions can thus be thought of as determiners over worlds and times, respectively. Instrumental and “free” adjunct clauses, on the other hand, tend to be untensed; this is to be expected if the operator (which is often covert) is taken to operate on sets of events and to act as a determiner over events.

This simple general picture is variously enriched and complicated by variations in the specific world, time, and event determiner meanings that specific subjunctions encode. These meanings range from the quite simple - existential (indefinite), definite, universal - to the quite complex (though there is no stable correlation between complexity of form and complexity of content), and the complexities go in several directions: some temporal subjunctions impose constraints concerning maximality (“while”), posteriority (“after”), or both (“since”), while some (“before”) encode both temporal and modal information; some modal subjunctions make implicit reference to negation (“because”) or intention (“in order that”). Sometimes there is reason to believe that the subjunction (“when”) depends on a possibly covert adverb of quantification which the clause serves to restrict; sometimes the conveyed relation is very vague - especially when the clause is untensed and there is no subjunction or preposition encoding anything, the intended relation is grossly underspecified and must be inferred from the context; then a variety of fairly specific meanings may result - temporal, causal, conditional - or we may be left with a loose “accompanying circumstance” interpretation.

Temporal clauses are treated first, as they present relatively simple and clear-cut cases. Next, modal clauses are addressed, starting with conditional clauses, which are similar to temporal clauses and a key to the meaning of all modal clauses. Instrumental and “free”, “absolute” clauses are treated last.

2. Temporal clauses

Temporal clauses are a subclass of temporal adverbials; like non-clausal temporal adverbials, they help situate events or states temporally. But in contrast to most non-clausal temporal adverbials, they do so indirectly, through other events or states. Thus in (1a), the event described by the verb is placed within the frame of a calendrical year, while in (1b), it is placed within a frame of a year’s duration through the state described by the verb of the “when” clause:

   b. My dad left when I was 7.

Similarly, in (2a), the events described by the verbs are placed in the immediate vicinity of a certain time of the clock, while in (2b), they are placed in the immediate vicinity of a time identified through the event described by the verb of the “when” clause:

(2) a. At six in the morning, she got up and started on the long way home from Ramallah to Jenin.
   b. When day broke, she gathered her children and grandchildren together and hotfooted it the 20 km to safety in Benin.
There are a number of variations on the theme thus exemplified by “when”, corresponding to a variety of different temporal subjunctions, some relatively simple, like “when”, others with a more complicated semantics.

2.1. Existential “when” and “while” clauses

When the eventuality described by the verb of the existential “when” clause or the verb of the root clause is a state, there is a symmetry between the two clauses in the sense that the temporal interpretation is preserved if they change roles, as in (1b) and (1c).

   b. My dad left when I was 7.
   c. I was 7 when my dad left.

The same applies when one of the two clauses has imperfective aspect, as observed for English by Partee (1984), cf. (3a/b), and for French by Kamp & Rohrer (1983); cf. the Italian sentence pair (4a/b) (Bonomi 1997) and the Russian sentence pair (5a/b).

(3) a. Nureyev revisited Russia when his mother was dying.
    b. When Nureyev revisited Russia his mother was dying.

(4) a. Ahmad Jamal fu notato da Miles Davis quando suonava in un trio.
    Ahmad Jamal was noted by Miles Davis when he played in a trio
    ‘Ahmad Jamal was noticed by Miles Davis when he was playing in a trio.’
    b. Quando fu notato da Miles Davis, Ahmad Jamal suonava in un trio.

(5) a. My s Iroj gotovili dokumenty, kogda pozvonil Borja.
    we with Ira prepared documents when called Boris
    ‘Irina and I were preparing the documents when Boris called.’
    b. Kogda my s Iroj gotovili dokumenty, pozvonil Borja.

The two versions may differ with regard to information structure (background or presupposition versus focus) and discourse relations, but hardly as far as the temporal relation is concerned.

This symmetry can be accounted for on natural assumptions about aspect, tense, time adverbials, and their interaction. Consider (1b). Assume that the phrase “I be 7” denotes a set of states, that it merges with a covert imperfective aspect to denote the set of times included in the runtime of one of those states, and that this merge merges with the past tense to denote the set coming from that set by filtering out the non-past times. Assume that the phrase “my dad leave” denotes a set of events, that it merges with a covert perfective aspect to denote the set of times including the runtime of one of those events, and that this merge merges with the past tense to denote the set coming from that set by filtering out the non-past times. An intuitively correct interpretation results if we treat the subjunction “when” as an existential determiner over times: There is a nonempty intersection between the set of past times included in the runtime of some “I be 7” state on the one hand and the set of past times including the runtime of some “my dad leave”
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Due to the symmetry of intersection, the interpretation of (1c) is the same. Similarly for (3a) and (3b), where both verb phrases denote sets of events but “his mother die” merges with an overt imperfective aspect. Similarly also for cases of mixed tenses (e.g. past - past perfect).

We can thus use the term “existential” for “when” clauses when they serve to relate single eventualities temporally. In (1) and (3), there is effectively just one maximal eventuality of the described type. In the general case, however, the set of past times included in or including the runtime of some eventuality of the described type must be assumed to be restricted to a contextually determined time interval (a topic time in the sense of Klein 1994, 2009), with room only for one eventuality, as in (2b). It has often been noted that the eventuality described in a temporal clause tends to be presupposed, as if there were a definite description; this way, attention is limited to one maximal eventuality. Although English “when” is indifferent to the number of relevant maximal eventualities (see 1.2 on universal “when” clauses), a subjunction may well come with the constraint that there is only one to be considered - e.g., German “als”.

In English, “when” can be used for both past and future times, cf. (6), but it is not uncommon to use two distinct subjunctions; thus in German, “als” is reserved for past times while “wenn” is used for future times (and in universal temporal and in conditional clauses).

(6) a. When I am 18 I will volunteer to serve in the armed forces.
   b. I will be 18 when we get married.

Recall that when the eventuality described by the verb of the existential “when” clause or the verb of the root clause is a state, there is a symmetry between the two clauses in the sense that the temporal interpretation is preserved if they change roles. However, as has often been noted, once both verbs describe events and have perfective aspect, the symmetry breaks down. Scholars from Heinämäki (1978) via Partee (1984), Hinrichs (1986), Sandström (1993) and Bonomi (1997) to Glasbey (2004) have observed that eventive “when” clauses typically ‘move time forward’, introducing a new reference time (topic time in the sense of Klein 1994, 2009) located ‘just after’ the event; “the event described by [the “when” clause] precedes (possibly as a cause) the event described by [the main clause]” (Bonomi 1997: 496); in the face of counterexamples, however, this is only “a pragmatic implicature”.

(7) When she died she left a massive doll collection.

(8) Labonte broke his shoulder when he wrecked at Darlington in March of 1999.

(9) When she died she was buried somewhere along the Ho Chi Minh Trail.

(10) I will marry him when he gets a divorce.

In (7) and (8), the “when” clause event and the main clause event plausibly coincide temporally, or the runtime of the former includes that of the latter, while in (9) and (10), the former is likely to precede the latter. The reverse is not possible; the former cannot be taken to succeed the latter. Sandström (1993) and Glasbey (2004) appeal to discourse
relations like ‘consequentiality’ or ‘reaction’ to predict the forward-movement use of “when”. It remains an open question, though, whether and, in the event, how the semantics of “when” should be constrained to capture this asymmetry. Some scholars prefer to formulate detailed meaning rules, others would rather appeal to more general pragmatic principles.

“While” clauses are similar to “when” clauses but seem to require that their predicates are atelic or supplied with progressive aspect (if not, as in (11), they are still interpreted as atelic), so the temporal relation conveyed will always be simultaneity, as in (11) and (12), or inclusion, as in (13).

(11) I sat with him while he regained consciousness.

(12) While she worked he was vomiting.

(13) While he slept she glued his chesspieces to the board.

This will follow if we assume that “while” operates on the set of time intervals provided by the tense phrase to yield the set of maximal elements (intervals not properly included in another interval), quantifying existentially over this set and the set supplied by the tense phrase of the main clause; then the content of the construction will be neurotic if the “while” clause predicate is truly telic and perfective: We would claim that there is a maximal time interval including, instead of included in, the runtime of an event of the given type. This is contradictory, unless the context provides a finite frame time; but then, the “while” clause will not serve to restrict that frame. This is one way of predicting that “while” only tolerates sets of intervals included in, not including, the runtime of an eventuality of a given type; there may be alternative ways.

2.2. Universal “when” clauses

When the eventuality type described by the predicate can have several maximal instantiations, the “when” clause can be interpreted as a universal quantifier over times. This is the natural reading of sentences like (14a) and (15a).

(14) a. When the customers were rude, I was annoyed and wanted to cry.

(15) a. When the Moon is rising, it seems larger than when it is high in the sky.

This can be modelled by saying that the clause serves to restrict a covert habituality operator. Two facts support this view. First, a habituality operator (or adverb of quantification) can be overt, as in (14b) and (15b). (As Bonomi (1997) points out, while overt adverbs of quantification can have different forces, the covert adverb is always universal or generic.) Second, habituality can be observed in connection with non-clausal temporal adverbials as well, cf. (15c).

(14) b. Sometimes when I am alone, I google myself.
(15) b. When the Moon is rising, it often seems larger than when it is high in the sky.
c. In the evening, the Moon often seems larger than in the night.

Such an analysis is not quite simple, though. First, as discussed by de Swart (1991), different temporal subjunctions, including “after” and “before”, interact with overt or covert-universal adverbs, hence they convey distinctive temporal information of their own which must be taken account of. Second, as discussed by Johnston (1994), it is not invariably the case that the temporal clause is the restrictor and the main clause is the nuclear scope of the adverb; it can be the other way around. This variation can be modelled with the help of focus, but Johnston derives it from a distinction between IP and VP adjunction: If the temporal clause is adjoined at IP level, it serves as the restrictor; if it is adjoined at the level of the VP, it serves as the nuclear scope.

2.3. “Since” (and “until”) clauses

“Since” clauses are a subset of “since” adverbials, as the word “since” can be used as a subjunction and as a preposition (the same goes for “until”). Unlike (existential) “when” and “while” clauses, “since” (and “until”) clauses are not directly about times including or included in the runtime of a salient eventuality of the described type; rather, such times serve to delimit a relevant interval to the left (these adverbials are accordingly sometimes called boundary adverbials; cf. e.g. Fabricius-Hansen 1986: 201). The right boundary of the relevant interval - the interval interacting with the intervals coming from the main clause - is an evaluation time, the utterance time if the main clause is in the present perfect (and the “since” clause in the simple past) tense; cf. (16a) and (17a). If the tense of the main (and “since”) clause is past perfect, as in (16b) and (17b), the evaluation time, the right boundary of the relevant time span, is a (here) contextually fixed past time.

(16) a. Her life has changed since she had her baby.
b. Her life had changed since she had had her baby.

(17) a. She has been weepy since she had her baby.
b. She had been weepy since she had had her baby.

Intuitively, in (16) the relevant time span is claimed to include the runtime of the main clause eventuality, while in (17) it is the other way around; the time between her having her baby and now (then) is claimed to be included in the runtime of her being weepy. This follows from simple considerations of the interplay between aspect, tense, and time adverbials once it is observed that in (16), the aspect of the main clause is perfective while in (17) it is imperfective: The main clause of (16a) can be taken to denote the set of past times abutting the utterance time (due to the present perfect) and including the runtime of a her life changing event, while that of (17a) can be taken to denote the set of past times abutting the utterance time and included in the runtime of a she being weepy state. If now the “since” clause denotes the time span stretching from the left boundary (the past runtime of the salient she having her baby event) to the right boundary (the utterance time), then on the most basic of composition rules this time is to be a member of the set of times denoted by the main clause, and the result is in accordance with our intuitions.
We encounter a slightly different usage of e.g. German “seit” in sentences like (18) or (19), where the tense in the subordinate clause is the present (or past), not the past (or past perfect).

(18) a. Seit sie Mutter ist, hat sie Angst vorm Fliegen.
   ‘Since she became a mother she has had fear of flying.’

   b. Seit sie Mutter war, hatte sie Angst vorm Fliegen.
   ‘Since she had become a mother she had had fear of flying.’

(19) Seit sie alleine lebt, hat sie enorme Fortschritte gemacht.
   ‘She has made enormous progress since she started living alone.’

Here the subordinate clause does not contribute a left boundary to the time span relevant for the superordinate clause, it contributes the relevant time span directly, through the runtime of the state described - though the constraint remains that this time abut the utterance, or, in the general case, evaluation time. Iatridou & von Fintel (2005) strive to reconcile this reading, where the two eventualities may seem to be presented as simultaneous, with the ‘boundary’ reading discussed above.

“Since” is restricted to past times; when talking about the future, we use the subjunction “until” instead; the use of German “seit” in (18) or (19), however, is mirrored in the future not by “bis” (≈ until) but by “solange” (≈ as long as). This lexical split might be taken to indicate that “seit” is really ambiguous.

2.4. “Before” and “after” clauses

(20a) is very similar in meaning to (16a). (20b) is a bit less similar:

(20) a. Her life has changed after she had her baby.

   b. Her life changed after she had her baby.

Here the simple past in the superordinate clause shows that what corresponds to the right boundary in the “since” case can be properly prior to the utterance time. It would seem that “after” just expresses a subsequence relation; say, the runtime of an event of the type described in the main clause succeeds the runtime of the salient event of the type described in the “after” clause. And we would expect the subjunction “before” to express the converse relation: that the runtime of an event of the type described in the main clause precedes the runtime of the salient event of the type described in the “before” clause.

(21) She had her baby before her life changed.

As observed in connection with “when” clauses, the information structure, in terms of what is given and what is new, may well be different, but purely semantically, it is difficult
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to detect a difference between (20b) and (21). We tend to think of “after” and “before” as logical converses, differing only in the direction of the temporal relation. However, closer scrutiny casts doubt on this view. Anscombe (1964) provided evidence which led her to conclude that while “after” involves existential quantification, “before” involves universal quantification. Heinämäki (1978) also proposed truth conditions on which “before” is not only opposite to, but also stronger than “after”. In one sense, however, “before” appears to be weaker than “after”: the latter, but not the former, is veridical, i.e. the temporal clause is entailed. Thus (22a) means something quite different from (22b).

(22) a. Spermicides destroy sperm before they penetrate the egg.
   b. Sperm penetrate the egg after spermicides destroy them.

Beaver & Condoravdi (2003) propose a uniform analysis of “after” and “before” differing only in the temporal relation, tracing the other differences to this asymmetry as it relates to initial parts of main clause eventuality runtimes and branching possible worlds. On this analysis, since worlds are identical in the backward but not in the forward direction, the reversal of the temporal order has a modal significance.

3. Modal clauses

In their analysis of “before” clauses, Beaver & Condoravdi (2003) (see 2.4) utilize possible worlds, similar to but possibly different from the actual world, to explain the non-veridicality of “before” and the ensuing non- or even counterfactual interpretations. This makes “before” clauses partway modal. Modal clauses relate the superordinate clause proposition to the subordinate clause proposition through some accessibility relation between possible worlds. This intensional, mood phrase modification can take various forms.

3.1. Conditional clauses

Intuitively, the only difference between (10), with a temporal “when” clause, and (23), with a conditional “if” clause, is that in (23), the event of him getting a divorce is not entailed or presupposed; the temporal relation between his getting a divorce and my marrying him seems to be the same.

(10) I will marry him when he gets a divorce.

(23) I will marry him if he gets a divorce.

So one might think that (23) only makes a prediction about the case where he in fact gets a divorce; in case he doesn’t, the sentence is trivially true. However, this notion of conditionals as material implications has by most scholars been considered too weak; (23) does seem to make a claim even if the antecedent is actually false, the same claim, mutatis mutandis, as the counterfactual (24).

(24) I would have married him if he had gotten a divorce.
Here, the “subjunctive” past tense forms presuppose that the antecedent is false, so for the sentence to be true or false, one has to look beyond the actual world to see whether the consequent is true together with the antecedent.

The possible-world analysis of “if” clauses originated with Stalnaker (1968) and was refined and variously modified by Lewis (1973a) and Kratzer (1981), i.a. (see article 59 (von Fintel) Conditionals for recent developments and alternative treatments). On Stalnaker’s original simple analysis, for (23) to be true in a world w, the consequent (that I marry him) must be true in the world closest to w (possibly w itself) where the antecedent (that he gets a divorce) is true; similarly for (24) (though here the closest world must be different from w and the events are in the past). This analysis, treating the “if” clause as a definite description over worlds, has recently been revived by Schlenker (2004).

To account for the temporal parallel between the “when” construction (10) and the “if” construction (23), one must say that in the closest world to w where there is a future time including the runtime of an event of him getting a divorce, one such time includes the runtime of an event of me marrying him, or something more restricted. This amounts to analysing “if” as (modal) “if” + “when” (Fabricius-Hansen & Sæbø 1983).

There is a vast literature on conditional clauses (see article 59 (von Fintel) Conditionals); they have probably been the subject of more discussion than all the other kinds of adverbial clauses taken together. This is not accidental: in some way or other, they are at the base of the meaning of all the other modal clause types.

3.2. Result clauses

What is commonly referred to as result clauses (or consecutive clauses) come in two varieties: Clauses introduced by “so (that)”, as in (25) or (26), and clauses apparently introduced by “that”, correlated with “so” modifying a gradable adjective in the main clause, as in (27) and (28).

(25) The walls tumbled down so that the Israelites could enter the city.
(26) Villages have been sealed off so that residents must enter or leave through control points.
(27) The wall is so high (that) I cannot get over it.
(28) In some places the rock face is so steep that you have to use a ladder.

Traditionally, result clauses have been considered to convey a causal relation and be closely related to causal clauses (see 2.3). Meier (2000) offers evidence against this view, arguing instead that the subordinate clause is overtly or covertly modalized (in (25)–(28) it is overtly modalized) and interpreted as a hidden, incomplete conditional for which the main clause provides the antecedent - in Kratzer’s theory (e.g. 1991), a proposition added to the modal base for the modal. In addition, the main clause is entailed. On this analysis, the (26) “that” clause is interpreted as the set of propositions p such that (if p) must (residents enter through control points); “so” denotes a relation between a set of propositions and a proposition to the effect that the latter is true and in the former. The
result is an interpretation corresponding to the following paraphrase: Villages have been sealed off, and if they have, residents must enter through control posts.

The analysis of the variant involving adjectives (cf. (27) and (28)) is more complicated (see also Meier 2001); simplifying a little, the main clause still supplies a conditional antecedent for an essentially binary modal overtly or covertly present in the result clause, but now, this proposition involves a degree in the actual world; a paraphrase of (27) could be: The wall is as high as it is (a tautology of course) and if it is as high as it actually is, I cannot get over it.

Meier’s work (2000, 2001) is the only formal semantic treatment of result clauses so far. It makes crucial use of the theory of modality developed by Kratzer (e.g. 1981) and the notion of a hidden conditional and even in many cases a hidden modal. Kratzer’s own theory extended to “if” clauses, and Meier takes it further; ahead might lie a conception of other kinds of modal clauses, say, causal clauses, as serving the purpose of supplying overt or covert modals with conversational background propositions. As yet, however, there is scarce evidence as to whether this is a feasible course, as the main focus of recent research on causal clauses has been on necessary conditionship and counterfactual dependence, as detailed in the next subsection.

3.3. Causal clauses

Causal clauses are clauses introduced by subjunctions like “because”, German “weil”, French “parce que”, or Russian “потому что”, clauses which can be used for answering “why” questions. The basic piece of meaning conveyed by these words is that the proposition expressed (or the event described) in the subordinate clause is the cause of, or reason for, the proposition expressed (or the event described) in the main clause, the effect, or consequence.

(29) They cannot return to their homes because the village has been destroyed.

For Meier (2000), one argument against ascribing a causal semantics to result clauses (see 3.2.) is that a paraphrase with a causal term does not make sense when the sentence represents a symptom relation, as in (30):

(30) The light on it is on so (that) it is getting power.

One would not say that the reason that the machine or motor is getting power is that the light on it is on. A more appropriate paraphrase, and one on which Meier (2000), as we have seen, bases her analysis, is in terms of conditionals:

(31) If the light on it is on it is getting power.

The same is true of causal clauses too: They can convey a symptom relation, in which case a paraphrase in terms of “if” is appropriate:

(32) It is getting power because the light on it is on.

And in fact, the dominant theory of causality and causal clauses was long based on, essentially, an implication from the cause to the effect: Between 1748, when Hume, as
Lewis (1973b) put it, defined causation twice over, and 1973, when Lewis revived the second definition (see below), the first one, according to which the cause is, given a set of premises, a sufficient condition for the effect, ruled the ground (see Sæbø 1991 for a more thorough discussion of this tradition).

One may be reluctant to call the regularity instantiated by (32) a causal regularity; the properly causal relation runs in the other direction, cf. (33):

(33) The light on it is on because it is getting power.

Still, a regularity analysis in terms of sufficient conditions and circumstances might be appropriate for causal clauses; what is in the word “because” might be wider than what is in the word “cause”. But the mainstream of “because” analysis has assumed a distinction between normal and abnormal cases (to put it bluntly): (29) and (33) instantiate the standard case while (32) instantiates one (the evidential use) of a range of derived cases, where causal clauses are used to provide reasons for speech acts (cf. e.g. Rutherford 1970); representatives, as in (32), or different kinds of directives, expressed by imperatives or interrogatives (see Sæbø 1991: 629f. for details).

However, in regard to what has been considered standard causal clauses, it will often seem inadequate to say that the cause, together with certain facts and rules, is sufficient for the effect. (34) might just lend itself to such an analysis, along the lines of a paraphrase like: always, if Constantine, or any emperor, embraces Christianity, or any novel religion, and relevant laws obtain and the circumstances resemble those obtaining in the case at hand, that religion is victorious; but a corresponding paraphrase of (35) is either implausible or rather vacuous.

(34) Christianity was victorious because Constantine embraced it.

(35) Christianity was victorious because Constantine defeated Maxentius in 312.

On the other hand, the counterfactual analysis, the seminal paper of which is Lewis (1973b), is well equipped to cope with this kind of examples, where laws are less relevant than our particular beliefs about possible worlds. This is Hume’s (1748) second definition: If the cause were not, nor would the effect be. As applied to (35), this analysis predicts the paraphrase (36):

(36) Christianity would not have been victorious if Constantine had not defeated Maxentius in 312.

This is a plausible paraphrase, and it has been widely embraced as an adequate basis for the semantics of “because” and other causal and causative expressions. Essentially, “q because p” is reduced to the counterfactual “not q if not p”, and this counterfactual is, in turn, given a ceteris-paribus analysis; the consequent is to hold in such possible worlds where the antecedent holds but where ideally all other facts about the world remain. To be explicit, “because” is assigned the following denotation in a world w: That relation between two propositions p and q such that (i) both are true in w and (ii) in the closest world to w where p is false, q is false as well. (This is the semantics for
conditionals according to Stalnaker 1968 and a simplification of the semantics for conditionals according to Lewis 1973a.)

There are ways in which this analysis can be refined so as to explain further facts about causal clauses: First, they should not refer to a time posterior to the time referred to by the main clause, cf. (37), and this can be made to follow from the counterfactual analysis if the similarity relation between worlds is explicated in terms of branching time (in a similar way as the nonveridicality of “before” as opposed to “after” could be explained by Beaver & Condoravdi 2003; see 2.4) (cf. Sæbø 1980).

(37) #The settlements perished around 1400 because the supply ships stopped coming around 1420.

It is reasonable to assume that the world closest to the actual world w where the supply ships went on coming around 1420 was identical to w around 1400, so that there is a contradiction: the settlements are to have perished and not to have perished around 1400.

Second, causal clauses seem stronger than corresponding counterfactuals, in particular concerning causal selection: A fact may depend counterfactually on many other facts, yet only some of them are likely to count as causes. Thus (38) seems to be contradicted by (39), although the two corresponding counterfactuals are compatible:

(38) She got the job because she applied for it.

(39) She got the job because she was qualified for it.

One solution to this problem, proposed by Dowty (1979: 106ff.), citing Abbott (1974), is to say that for a causal factor to be a (the) cause, it must be false in a relatively close world: “It does seem that often, if not always, we select as the “cause” of an event that one of the various causal conditions that we can most easily imagine to have been otherwise, that is, one whose “deletion” from the actual course of events would result in the least departure from the actual world.” (Dowty 1979: 107) This idea might also be used to account for the differences between causes expressed by causal clause modifiers like “partly” and “mainly”:

(40) She is an A student partly because she has private tutors, but mostly because she studies diligently.

It is not obviously plausible, however, that the “mostly because” fact is in this case a more labile fact than the “partly because” fact. Rather, it would seem that the main clause fact depends more heavily on the “mostly” cause, in the sense that if the “partly” cause were false and the “mostly” cause true, she would be, say, a B student, whereas if the “mostly” cause were false but the “partly” cause true, she would be, say, a C student. Let us say that “a partly because b but mostly because c” entails “a because b and because c” and, in addition, “if not b (but still c), almost a” and “if not c (but still b), far from a”, where “almost” and “far from” have a modal meaning along the lines of Rapp & von Stechow (1999), i.e. in terms of world similarities. Assume that f assigns to the world w and the proposition p the closest world to w where p is true; the different status between b
and c could be captured by stating that the distance between \( f(w, \sim b) \) and \( f(f(w, \sim b), a) \) (where \( w \) is the actual world) is significantly shorter than that between \( f(w, \sim c) \) and \( f(f(w, \sim c), a) \).

This may not be the final answer to how constructions like (40) should be treated, but the suggestion illustrates how the framework of counterfactual dependence and possible world similarity can be exploited to express such subtle distinctions as causal clauses in natural languages appear to call for.

As for the non-standard cases referred to above, where causal clauses are used for giving reasons for speech acts, and not necessarily assertives, there have been several attempts at assimilating them to the standard case, ranging from the performative hypothesis (Ross 1970) to pragmatically oriented approaches (cf. Sæbø 1991: 629f. for a more thorough discussion). One may note that while English “because” clauses can be used for giving reasons for directives or interrogatives, in other languages this is mainly done with subjunctions corresponding to “since”, where the causal relation is arguably presupposed, or with causal conjunctions like French “car” or German “denn” (cf. Scheffler 2005 for a recent treatment of “denn”).

3.4. Purpose clauses

As observed by Aristotle (Metaphysics, Book 5, Chapter 2), causal clauses are not the only ones that can answer “why” questions; purpose clauses can too. Purposes, or ends, figure as his fourth type of cause:

“'Cause' means [...] (4) The end, i.e. that for the sake of which a thing is; e.g. health is the cause of walking. For 'Why does one walk?' we say; 'that one may be healthy'; and in speaking thus we think we have given the cause.”

Now clearly, a purpose clause does not answer a “why” question in the same way as a causal clause; (41) and (42) (in Classical Greek) are far from synonymous:

(41) Peripatei hina hugiainêi.
    'I walk in order to be healthy.'

(42) Peripatei epeidê hugiainei.
    'I walk because I am healthy.'

Both clauses may serve to give a cause, but not the same type of cause. Causal (“epeidê”) clauses give a source-of-motion cause, a causa efficiens, while purpose (“hina”) clauses give a cause-as-end, a causa finalis:

“[...] as [causes] are spoken of in several senses it follows [...] that things can be causes of one another (e.g. exercise of good condition, and the latter of exercise; not, however, in the same way, but the one as end and the other as source of movement).”

This seems to imply that (41) is closely related to the reversal of (42), (43):

(43) Hugiainei epeidê peripatei.
    'I am healthy because I walk.'

One analysis of purpose clauses has been based on this relation: von Wright (1971) proposed that a sentence like (44) entails that the agent believes (45):
(44) Vivegan vai bivan. (North Sami)
‘I run in-order-that I keep warm’

(45) Bivan dainna go vivegan.
‘I keep warm because I run’

“If...I say that he ran in order to catch the train, I intimate that he thought it...necessary, and maybe sufficient, to run, if he was going to reach the station before the departure of the train.” (von Wright 1971: 84)

“We ask ‘Why?’ The answer often is simply: ‘In order to bring about p.’ It is then taken for granted that the agent considers the behavior which we are trying to explain causally relevant to the bringing about of p...” (von Wright 1971: 96f.)

Consider the following paraphrase of “a does m in order to e”: “a wants to e and a does m and a believes that doing m is the best way to e”. It seems convincing, but unfortunately, it is too weak: It fails to distinguish between two ends where one counts as the purpose and the other is just a pleasant side-effect:

(46) MS sponsors us to spur development.

(47) MS sponsors us to save taxes.

Both (46) and (47) could come out true on the analysis inspired by von Wright, even if one might be inclined to reject either (46) or (47).

But there is another way of relating purpose clauses to causal clauses, suggested by von Wright (1971: 192): (48) might “depend on the truth of a nomic connection between his ‘anxiety to catch the train’... and his running.” This analysis, which has been subscribed to by many linguists (e.g. von Stechow, Kraskova & Penka 2006: 153), predicts that (48) and (49) are synonymous:

(48) He ran in order to catch the train.

(49) He ran because he wanted to catch the train.

More generally, it seems possible to equate “q in order that p” with “q because the agent wants that p”, - which, in turn, would be evaluated via the counterfactual “not q if the agent did not want that p”.

This will distinguish between (46) and (47) if MS wants to spur development and to save taxes and considers it necessary for both ends to sponsor us but only one end is such that MS would not sponsor us if it did not want that end.

Note that one cannot assume that “the agent” is the agent of the eventuality described in q - this eventuality is not invariably an action, or even an event:

(50) From time to time, the bridge goes up in order that a ship may pass beneath it.

(51) The bridge is so high in order that ships may pass beneath it.

Here the agent must be the causer of the event or state described in q. The next pair of examples show that in addition, (s)he must be required to deliberately cause that event
or state: (52) only has a reading on which the main clause event is agentive, but (53) also has a reading on which the main clause event is nonagentive.

(52) We started an avalanche to reach the summit.

(53) We started an avalanche because we wanted to reach the summit.

3.5. Concessive clauses

Concessive clauses, introduced by subjunctions like English “although”, are like causal clauses in that they are factive with respect to the subordinate clause and the main clause, but unlike causal clauses in that they cannot have narrow scope vis-à-vis other operators; negation, say, will unambiguously affect the main clause, not the concessive relation, in a sentence like (54):

(54) The burglars were not monitored although there were cameras around them.

(55) The burglars were not caught because they were monitored (but because...).

As observed by König (1988) and by Haspelmath & König (1998), concessive subjunctions are often related to conditional subjunctions in combination with scalar particles (“even though”, “even if”), and this is suggestive of their meaning: They seem to imply that the main clause proposition would a fortiori be true if the concessive clause proposition were not true, that is to say, “q although p” seems to entail p and q and, moreover, to imply that q would surely hold were p not to hold; cp. (56) and (57):

(56) The burglars were caught although they were not monitored.

(57) The burglars were caught; they were not monitored; and if they had been monitored, they would have been caught.

This analysis, advocated by i.a. König (1991) and by König & Siemund (2000), means that the concessive “q although p” implies the same counterfactual as that entailed by the causal “−q because p”. As observed by König & Siemund (2000), a sentence like (56) can be paraphrased by a sentence like (58), where negation has wide scope but is taken to affect the main clause (‘it is not the case that the burglars were not caught because they were not monitored’):

(58) The burglars did not escape because they were not monitored.

In this case, it is reasonable to assume that the causal, counterfactual relation and the causal clause proposition are presupposed, escaping negation. What must evidently be stipulated is that this semantic structure is the only possible semantic structure for concessives: the concessive counterfactual relation, “q if −p”, is systematically out of focus.

4. Instrumental and free adjunct clauses

The types of adverbial clauses treated in 2. and 3. leave a residue of mostly nonfinite adjunct clauses expressing a wide variety of meanings. Often, these meanings are underspecified, depending on contextual factors for specification.
4.1. Instrumental clauses

The common notion of instrumental clauses is that they present one action as an “instrument” of another; they are often formed by a preposition and a gerund phrase, as in (59) and the French translation (60), but they can also be formed by a subjunction and a finite clause, as in the German version (61):

(59) Rosa Parks stood up by remaining seated.

(60) Elle s’est levée en restant assise.

(61) Sie stand auf, indem sie sitzen blieb.

The “instrument” relation is difficult to make precise. The main clause action type tends to be relatively unspecific, the subordinate clause elaborating on it by providing more specific content. The above examples are instructive in this regard: At one level, the instrumental clause contradicts the main clause; but the latter’s predicate is to be read not in the literal, concrete sense but in the derived, abstract sense, and the instrumental clause predicate serves to specify what makes the act of Rosa Parks an act of standing up (to injustice) - namely, being a remaining seated act.

There is a strong intuition, going back to Anscombe (1957), that the “by” phrase predicate and the superordinate clause predicate describe one event in two ways. The immediate problem facing an analysis based on this intuition is that it easily predicts a symmetry between the two predicates; crucially, however, the structure is asymmetric:

(62) ? Rosa Parks remained seated by standing up.

According to Bennett (1994), this asymmetry falsifies the “Anscombe thesis”. On the other hand, attempts at ascribing an asymmetric relation to the instrumental preposition or subjunction are likely to run into problems as well. It is tempting, for example, to assume a causal relation between two events or propositions; but when the main clause predicate is causative, as it often is, it will not do to give a causal meaning to the preposition or subjunction, since this will result in a duplication of the causal relation already expressed, in (63) by “change the course of history”.

(63) By remaining seated, Rosa Parks changed the course of history.

It is useful to note that a verb like “change” is a manner-neutral causative in that it does not specify the way in which the change is brought about, and intuitively, the “by” phrase predicate fills this slot, specifying the causing event type. Similarly, predicates like “stand up (to injustice)” or “defy the bus driver”, called criterion predicates by Kearns (2003), can be said to open a slot for the event type that meets the relevant - conventional or intentional - criteria. These observations underlie the analysis proposed by Sæbø (2008), where the causative or criterial, abstract predicates are decomposed to lay bare an argument place for a concrete predicate, merging with the “by” phrase predicate by unification. This or a similar analysis would carry over to “en” gerund phrases in French and to corresponding instrumentals in other languages. Another, similar approach is taken by Engelberg (2005), who invokes the notion of supervenience to model the dependence of a verb like “help” on more specific eventuality descriptions.
But, as observed by Fabricius-Hansen & Behrens (2001), German “indem” clauses have a wider field of use than English “by” or French “en” phrases; although “indem” typically establishes a relation of Elaboration between main and subordinate clause, it is not always obvious that the main clause predicate at some level of decomposition involves the subordinate clause predicate as a kind of argument. Translation studies reveal that “indem” clauses are often translated by “free” gerund clauses, without a preposition, into English, and vice versa; a form of adjunct known to cover a wide spectrum of relations, to be treated in the next section.

4.2. Participial clauses

When there is no subjunction or preposition to signal a relation, so that nonfiniteness is the only sign of subordination, an adjunct clause may be expected to modify its main clause in a quite unspecific way. In large measure, this is borne out: Present (gerund) or past participial clauses allow for a wide array of interpretations (cf. Kortmann 1995 and König 1995). However, as shown by e.g. Behrens (1998), a clear tendency can be observed to maximize the interpretational options offered by the lexical content and the context, ranging from mere ‘accompanying circumstance’ to more ‘semantical’ discourse relations.

Consider first a few cases similar, but not identical, to the “instrumental” cases considered above: In (64)–(67), it will not do to interpose the preposition “by”, yet the relation between the two event types is not very different from the relation between the two event types in (59) or (63).

(64) The trout struggled, wriggling and writhing.

(65) I drove cautiously, looking out for danger on the road.

(66) A fellow traveller was playing guitar, using a knife for a slide.

(67) She did the job with the tools at hand, using a chisel for a pry bar.

The reason that an instrumental “by” is not appropriate here seems to be that the main predicate does not provide a variable for the adjunct predicate; still, the latter is taken to elaborate on the former, and, as argued by Behrens (1998), building on Asher (1993), elaboration here seems to mean that the adjunct event is a subevent of the main event. Thus in (64), the wriggling and the writhing are to be interpreted as subactivities of the struggling. According to König (1995), the two “converbs” and the main verb describe two aspects or dimensions of one event.

Behrens (1998) identifies a distinct form of event unification induced by postposed -ing adjuncts with causative verbs, as in (68):

(68) A passenger train carrying Kenyans and hundreds of tourists from abroad to the coastal port of Mombasa derailed at high speed on Wednesday, killing at least 32 people, including five foreigners.

While the subject of an -ing adjunct is generally assumed to be coreferent with the subject of the main clause, maybe through a subject controlled PRO, in (68) this is not
intuitively correct: The train is not what killed the people; rather, it is the event of the train’s derailment. On the analysis proposed by Behrens (1998: 113ff.), the subject PRO is in such cases an event PRO, controlled by the main clause event and equal to the unspecified causing event.

Preposed -ing adjuncts provide particular interpretational options. Under given conditions, the adjunct can be intended to convey largely the same relations as a conditional, “if” clause (Stump 1985), cf. (69) and (70), a causal, “because” clause, cf. (71), or a temporal, “when” or “while” clause; cf. (72)–(74):

(69) Driving slowly through Thorpe, you will see signs for Dovedale on the way.

(70) Looking out abeam, we would see a hollow like a tunnel formed as the crest of a big wave toppled over on to the swelling body of water.

(71) Having confessed to having sex with the girl, the man was sentenced to one year on an abandoned island.

(72) Reaching the coast, they sought to prevent departure from their homeland by rising in rebellion.

(73) Reaching the coast, they pick up the scent of their home river.

(74) Investigating a murder, Chief Inspector Maigret has difficulty penetrating the wall of silence maintained by the family involved.

Generally, as argued by Behrens (1998), free -ing adjuncts seem to lend themselves to the strongest relation relevant and plausible in view of the lexical items at hand and the context. This is not to deny that in many cases, the strongest relation there is license to infer is that of an ‘accompanying circumstance’, or connectedness; the adjunct and the main clause are about the same time, the same place, and the same subject, cf. (75) and (76).

(75) Smiling, she said, “I’ll miss you.”

(76) He walked out of the woods carrying an axe.

Such a relation is characteristic of yet another underspecified adverbial clause type: Absolute constructions, to be treated in the next section.

4.3. Absolute clauses

While the “converb constructions” (Haspelmath & König 1995) discussed above mostly display participle verbs with empty subjects, this term is also used to cover “absolute” small clauses like those in (77):

(77) Dazed and shaking he pulled himself up, his left arm hurting him.

Such adverbial small clauses can be augmented with a comitative preposition (“with”), without much of a change in meaning (note, however, that these augmented absolute
adjuncts can constitute the sole focus domain of the sentence and should probably be
classified as depictives; see article 54 (Maienborn & Schäfer) *Adverbs and adverbials* on
the delineation between adverbials and depictives):

(78) She woke up in the middle of the night with her arm hurting her.

(79) He woke up that Thursday morning with a gun pointing at him.

Furthermore, the absolute small clause can have an adjective or a prepositional phrase
as its predicate:

(80) Cécile woke with a start, her neck stiff from having fallen asleep in a straight-backed
chair.

(81) Cécile is standing with a gun in her hand and her finger on the trigger.

Semantically, what unites these cases is, unspecified as the relation between the main
eventuality and the SC (supplement) eventuality may be, the notion of
a concomitant eventuality, attended by T(ime)-S(pace)-P(articipant)-connectedness
(Rothstein 2003; Fabricius-Hansen 2007): The two eventualities manifest a unity of time
and place and thus a “perceptual unity” (König 1995), and, some participant of the host
event must bind an explicit or implicit anaphor in the supplement. In (77)–(81), the sub-
eventuality of the host binds an explicit possessive or nonpossessive anaphor in the subject or
predicate of the supplement.

TSP-connectedness can hold across sequences of autonomous sentences; what abso-
lute constructions will provide is a guarantee of TSP-connectedness. However, Fabricius-
Hansen (2007) argues that in addition to conveying such relations, such constructions
serve to build groups of events or states, expressing that the host and supplement event-
ualities form interesting sums of eventualities, an idea going back to Pusch (1980).

According to this analysis, in (77) the core event and the co-eventualities all add up to
one super-, group eventuality. Thus, even adverbial clauses without any overt sign of the
mode of modification will modify their main, host clauses semantically in a nontrivial
way.

5. Conclusions

The range of phenomena bundled together under the label *adverbial clauses* is so
diverse as to defy easy generalization. What can safely be said, though, is that any adver-
bial clause serves to modify some aspect of the main clause meaning: At some level
between, from below, the verb phrase, denoting a set of events or states, the tense phrase,
denoting a set of times, and the mood phrase, taken to denote a set of worlds, the subor-
dinate clause merges with the main clause to further identify its denotation, whether by
functional application, intersection, quantification, or unification.

Generally, this proceeds by way of the meaning of the subordinate clause at the rel-
levant level. Thus a “free”, nonfinite clause can be considered to contribute a set of event-
ualities, a temporal clause contributes a set of times, and a modal clause contributes a
set of worlds; the subjunction (or relevant interpretive mechanism) then relates this to
the corresponding dimension of the meaning of the main clause, in the lexically (or discourse structurally) determined way. In the simplest cases, the subjunction can be likened to a definite, indefinite, or universal determiner, turning the modal (“if”) or temporal (“when”) clause set of worlds or times into a definite world or a quantifier over times (a set of set of times).

Elsewhere, more elaborate relations are involved; some temporal subjunctions define intervals stretching to or from the evaluation time (“since”, “until”) or convey precedence relations (“after”, “before”), modal subjunctions may involve negation (“because”, “although”) or intention (“in order that”). In yet other, notably instrumental, cases, it is less clear what relation between two sets of eventualities is encoded in the subjunction; and in “free”, nonfinite adjunct clauses, there is no lexical sign of the relation. Although often, there is ample reason to infer a modal or a temporal relation or a relation of elaboration as event inclusion, often enough all that can be inferred is an “attendant (accompanying) circumstance”, where main clause and subordinate clause eventualities can be assumed to add up to a more comprehensive, super-event.

Subjunctions vary in two dimensions: Specificity and complexity (of meaning). One might expect semantic simplicity vs. complexity to correlate with lexical, or morphological, simplicity or complexity; - this, however, is easily falsified: The Ancient Greek (“hina”) or North Sami (“vai”) purpose subjunctions testify to an advanced level of grammaticalization while expressing one of the most elaborate semantic relations.

Several subjunctions do double duty in the sense that they underspecify the semantic relation they encode - they correspond to two (or more) subjunctions in another language. For example, English “when” can be universal or existential in the past or future; German “wenn” can be conditional or temporal (universal or existential in the future). This attests to (1) the interrelatedness of the temporal and the modal dimension (also indicated by the use of past forms in counterfactual environments, cf. Iatridou 2000), and (2) the role of the context of utterance in clarifying what relation is meant by a certain adverbial clause.

So what are, again, adverbial clauses - is a common characterization so vague as to be vacuous? Probably not; for one thing, they differ from other adverbials in utilizing the same kind of material they serve to modify (basically, things that clauses can express); and second, they differ from other subordinate clauses in carrying a more or less complex and specific semantic relation on their own, - even when the relation is, by itself, highly unspecified, contextual and pragmatic factors conspire to narrow it down.

6. References


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