

DOUBLE PERFECTS IN SWISS GERMAN*

Sander Nederveen
University of British Columbia

This paper presents a semantic and morpho-syntactic analysis of the double compound perfect (DCP, also known as ‘perfect doubling’) in the Zürich dialect of Swiss German.¹ The double compound perfect is a construction in which there are two instances of the perfect participle in one clause, as in (1):²

- (1) CONTEXT: ‘Why did you arrive so late from the airport yesterday?’
D’Suzi hät ihre Koffer verlore **ghaa**
the Suzi have.3SG her suitcase lost.PERF have.PERF
‘Suzi had lost her suitcase’

In (1), the lexical verb *verlore* takes the morphological form of the perfect participle. The morpheme *ghaa* is taken to be the perfect participle of ‘to have’ (Barbiers, 2008; Brandner, 2008). Having both in one clause amounts to the double compound perfect (Salzmann and Schaden, 2019). The DCP in Swiss German gives rise to an interpretation such that the losing of the suitcase occurred prior to another event in the past, namely the arriving from the airport, i.e., a double backshift.

Morphological doubling of the perfect participle has been observed in various Alemannic dialects (Brandner, 2008; Brandner et al., 2016; Salzmann and Schaden, 2019), in Dutch dialects (Barbiers, 2008; Koeneman et al., 2011), and in Friulian (Romance; Poletto 2009). This paper presents a semantic and morpho-syntactic analysis of aspect in Swiss German that allows us to account for the semantics and morphology of the DCP.

1. Empirical properties of the DCP

It has been widely assumed that Swiss German and other Alemannic dialects have lost synthetic past tense and thus express past eventualities in an alternative way (Brandner 2008; Barbiers 2008, among others). In Swiss German, the single perfect is used to denote a single backshift. Moreover, contrary to Standard German (Musan 2001; Pancheva and von Stechow 2004), the single perfect cannot be used with a time frame adverbial that indicates (near) overlap of the event with the utterance (2a). Conversely, if the only aspect

*I would like to thank Lucas Chambers for patiently giving judgments. Also many thanks to like Ryan Bochnak and Lisa Matthewson for their feedback and comments on previous versions of this work.

¹This paper is exclusively concerned with the *active* Double Compound Perfect, and does not discuss the *haben*-passive or the adjectival Double Compound Perfect.

²This paper uses the following abbreviations: SG = singular; PL = plural; 1/2/3 = 1st, 2nd, 3rd person; ASP = aspect; PERF = perfect; PROG = progressive; FIN = finite; PERS = person; PRT = participle.

in the clause is progressive, the interpretation is that of a present progressive, which cannot co-occur with a frame adverbial for the past (2b).³

- (2) a. De Thomas hät geschtr / ??jetzt de Brief gschribe
 the Thomas has.3SG yesterday / now the letter write.PERF.
 ‘Thomas wrote the letter yesterday/??now’
- b. De Thomas isch ??geschtr / jetzt am laufe
 the Thomas is.3SG yesterday / now walking.PROG
 ‘Thomas is walking ??yesterday/now’

The difference between single perfect and progressive morphology illustrates that, in (2a), perfect aspect is responsible for requiring that an eventuality be prior to speech time, i.e., a past event. By contrast, the progressive requires that the speech time be included in the event time.⁴ The difference between single perfects and the progressive arises not only with frame adverbials like ‘yesterday’ or ‘now’, but it also exists in relevant discourse contexts:

- (3) Peter walks in and his wife asks where he was, to which Peter answers:
- a. Ich ha d’Pflanze gosse I have.1SG the plants watered
 ‘I watered the plants’
- b. ?? Ich bi d’Pflanze am güüsä I am.1SG the plants watering
 ?? ‘I’m watering the plants’

The judgments are reversed in a context that forces a reading such that the eventuality denoted by the sentence is simultaneous to the speech time:

- (4) Peter’s wife asks what he is currently doing, to which Peter answers:
- a. ?? Ich ha d’Pflanze gosse I have.1SG the plants watered
 ?? ‘I watered the plants’
- b. Ich bi d’Pflanze am güüsä I am.1SG the plants watering
 ‘I’m watering the plants’

The data above shows that Swiss German single perfect morphology places an event at a time prior to speech time. We see that in progressive sentences (4b) the event denoted by the verb happens simultaneous to the speech time. Example (2a), however, shows that the seemingly present tense on the auxiliary does not warrant the use of the time frame adverbial *jetzt* ‘now’. This is contrary to what is often assumed about the single perfect in Standard German (see Musan 2001). For present perfect morphology in Standard German it is assumed that the perfect operates under a present tense auxiliary, which in turn allows for the use of the present perfect with present time frame adverbials. Since Swiss German does not allow present perfect morphology together with a present time frame adverbial,

³Double question marks (??) indicate semantic infelicity.

⁴The finite auxiliary in a single progressive cannot inflect for past tense, hence speech time is included in the event time in single progressive clauses.

it appears that there is no present tense that operates in a single perfect, and that Swiss German single perfect morphology constitutes a shift backwards from speech time.

Given that the single perfect morphology constitutes a backshift, we face the question whether this temporal ordering relation is existential or pronominal. Pronominal temporal ordering relations are deictic, which means that there is reference to a specific time that a backshift refers to. Similar to how pronouns refer to a specific individual, pronominal time reference picks out a specific time. Existential temporal ordering relations do not need to refer to any specific time, and can therefore be used out of the blue. For the purposes of this paper, I assume that single perfect morphology in Swiss German has an existential temporal interpretation.⁵ In the next section, I discuss the empirical pattern of the Double Compound Perfect and the interpretation of embedded clauses. The data presented in this section and the next one will allow us to provide semantic denotations for progressive and perfect morphology, while taking into account the interpretation of embedded clauses in Swiss German.

1.1 On the interpretation of perfect and progressive aspect

Since Swiss German has lost a synthetic past (Brandner, 2008), it uses the perfect to indicate that an eventuality is backshifted with respect to speech time, which has been outlined above. Consequently, interpretations with a double backshift are derived without a synthetic past as well. In these cases, the DCP surfaces. The attributed meaning of the double compound perfect construction is taken to give rise to a double backshift in time, more or less equivalent to the English past perfect. The use of *ghaa* and *gsii* – the perfect participle of ‘to be’ – in constructions where ‘have’ and ‘be’ and their complement make up an adjectival predicate, places the predicate at a time prior to speech time, just like any other single perfect in Swiss German (see Brandner 2008; Brandner et al. 2016; Salzmann and Schaden 2019). This is illustrated in (5) and (6).

⁵Much like with the English simple past, it is hard to distinguish whether Swiss German single perfect morphology is pronominal or existential. For instance, you can use a single perfect to pick out a specific time (in (1), based on Partee 1973: 602; context from Chen et al. 2020), or you can use it out-of-the-blue (in (2), adapted from Kratzer 1998: 16):

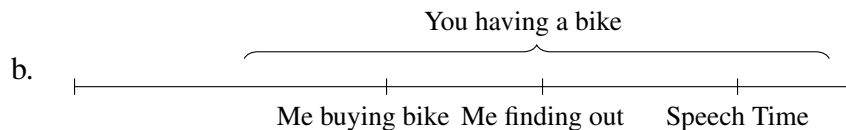
- (1) Driving on the highway after leaving the house, you realize that you didn’t turn off the stove:
 Ich ha de Ofe nöd abgschtellt.
 I have.1SG the stove not shut off.PERF
 ‘I didn’t turn off the stove’

- (2) Imagine you are looking at churches in Italy. There is no previous discourse when the following question comes up:
 Wer hät die Chile baut?
 who has.3SG the church built.PERF
 ‘Who built this church?’

- (5) a. D'Suzi hät fieber
the Suzi has.3SG fever
'Suzi has a fever'
- b. D'Suzi hät fieber ghaa
The Suzi has.3SG fever have.PERF
'Suzi had a fever'
- (6) a. D'Suzi isch krank
the Suzi is.3SG sick
'Suzi is sick'
- b. D'Suzi isch krank gsii
the Suzi is.3SG sick be.PERF
'Suzi was sick'

So far, we have seen that single perfect morphology gives rise to a single backshift, placing the event described by the main verb prior to speech time. Examples (5b) and (6b) show that *ghaa* and *gsii* are the perfect participles of 'have' and 'be'. The Double Compound Perfect is a construction that has perfect morphology, and additionally has either *ghaa* or *gsii*. Importantly, when *ghaa* or *gsii* is added to a single perfect, the clause yields an interpretation with a double backshift:⁶

- (7) a. Ich han s'Velo scho gkauft ?? (**ghaa**) wo ich usegfunde
I have.1SG the bike already bought.PERF have.PERF when I found out.PERF
han das du bereits scho eis häsch
have.1SG that you already already one has.2SG
'I had bought the bike already when I found out you already have one'



Example (7) shows that when *ghaa* is added to the bike-buying event, it places this event at a point in time prior to the finding-out event. In order to yield this interpretation, insertion of *ghaa* is obligatory. If *ghaa* is omitted, the sentence is pragmatically ill-formed. The interpretation without *ghaa* is such that the event of buying a bike for someone else overlaps with the state of knowing that they already have one.

To understand how the double compound perfect makes (7) felicitous and why the single perfect is ill-formed, consider the relation of the matrix event to the *when*-clause. Arguably, in these sentences, the *when*-clause sets the reference time. The *when*-clause contains a perfect participle, setting the reference time at a time prior to speech time. The first perfect in the matrix clause places the matrix event time at a point simultaneous to the reference time; the second perfect, *ghaa*, shifts the matrix event time further back such that the buying event occurred prior to the reference time. When the matrix clause contains only one perfect, i.e., a single backshift, then this gives rise to an interpretation such that the matrix event and the event in the *when*-clause are simultaneous – a reading that is contextually odd. Example (7) suggests that the double compound perfect gives rise to a double backshift in time, much like a past perfect in English.

⁶For the purposes of this paper, I assume that the semantic contribution of *ghaa* and *gsii* is the same.

The next example shows that the double backshift driven by the DCP need not be relative to a reference time that is given in the same utterance. Rather, if a discourse context sets a reference time prior to speech time, the use of the DCP gives rise to an interpretation that the event in the utterance occurred prior to the contextually set reference time.

- (8) You visited your brother's house, which is usually very messy. This time it was very clean. When you go home, you wonder why the house was so clean. Your partner, who was there, explains why:

Mark hät de Abfall usebraacht ?? (ghaa)
 Mark has.3SG the garbage brought outside.PERF have.PERF
 'Mark had put the garbage out'

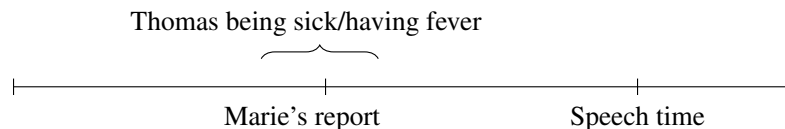
In (8), the context provides a situation in which the event of putting out the garbage must have occurred prior to arriving for the visit. Using only single perfect morphology suggests an interpretation such that arriving for the visit is either simultaneous to the event described by the utterance in (8), or that the event in (8) is unrelated to the entire visiting event, neither of which are good in the context.

Before I present a semantic and morpho-syntactic analysis of how temporal relations are constituted in Swiss German, it is important to look at the interpretation of embedded clauses in Swiss German. This will inform us about whether time reference in Swiss German is relative or absolute.

1.2 On the interpretation of embedded clauses

This section outlines the relevant empirical facts with respect to finite clauses embedded under matrix clauses with single perfect morphology. Consider the example in (9). The timeline illustrates its interpretation.⁷

- (9) Imagine you organized a school party and you didn't invite Thomas. Someone asks you why Thomas wasn't invited to the party:
- a. D'Marie hät gseit, das de Thomas krank isch/feiber hät
 the Mary have.3SG said.PERF that the Thomas sick is.3SG/fever have.3SG
 'Mary said that Thomas was sick/had a fever'
 - b. Interpretation of (9):



The example above illustrates that when a stative predicate without single perfect morphology is embedded under a matrix clause *with* single perfect morphology, the complement clause can be interpreted simultaneous to the matrix clause. However, it could in fact

⁷For the discussion of embedded clauses, I rely on embedded statives. There is no possible way to include a non-stative and non-habitual embedded clause without either perfect or progressive aspect. I leave more exhaustive explorations of embedded clauses in Swiss German for future work.

be the case that the complement clause holds true at speech time. The consultant added that it is unclear from the utterance itself, and example (9) does not make clear whether the Thomas' sickness is continuous or a separate, Double Access Reading (Abusch 1988; Ogihara 1995). Example (10), however, provides evidence that there is no Double Access Reading in Swiss German.

- (10) Vor zwei Jahr hät de Peter gseit das d'Marie schwanger **isch**
 ago two year has the Peter said that the Mary pregnant is.3SG
 'Two years ago Peter said that Mary was pregnant'

Example inspired by Abusch (1997)

The interpretation of (10) is unambiguous: Mary's pregnancy held true for Peter at the time of his report, which was two years prior to the speech time of the entire sentence. As such, when the embedded clause lacks a backshifting operator, the embedded clause is interpreted as simultaneous to the event time of the matrix clause. In summary, the data above shows that the temporal interpretation of the embedded clause can be relative to the eventuality of the matrix clause.⁸

The data above has shown that embedded clauses with stative predicates in Swiss German can be interpreted simultaneous to the matrix-clause event when the embedded clause lacks perfect morphology. When the embedded clause has perfect morphology there is a backshift placing the embedded stative predicate at a time prior to the matrix-event.⁹ To sum up, then, the empirical picture is that non-perfect under perfect gives rise to a simultaneous reading and a perfect under perfect gives rise to a backshifted reading

The data above illustrates that the temporal interpretation of embedded clauses is relative to the main-clause event. Following Abusch (1997), I assume that complement clauses denote predicates of times, and that moreover, the embedding predicate in the matrix clause selects a predicate of times as its complement. Under such an approach, the event time of the complement clause is evaluated relative to the clause-selecting matrix verb. Hence, if an embedded clause is not backshifted, this means it is simultaneous to the event described by embedding predicate. If the embedded proposition is backshifted, it will be with respect to the reference time of the embedding predicate.¹⁰ The interpretation of embedded clauses in Swiss German allows us to formulate the generalization that temporal ordering relations in Swiss German are relative in both matrix and embedded environments.

⁸This pattern extends to clauses with single perfect morphology that are embedded under a matrix clause that also uses the single perfect. This data has been omitted for reasons of space.

⁹The data in this section only explicitly provides evidence for such an interpretation for statives. More research is needed to explore the interpretation of embedded eventive predicates.

¹⁰The precise implementation with regards to the semantics of clausal embedding in Swiss German is left for future research. There have been a number of promising suggestions about how to derive the temporal ordering relation of clausal complements (see Kusumoto (1999), von Stechow (2009), and Bochnak et al. (2019), among others)

2. A compositional semantics of Swiss German aspect

The previous section illustrated the use of the DCP, showing its semantic contribution to a clause. Essentially, the DCP constitutes a double backshift in time, such that $\text{EVENT TIME} < \text{REFERENCE TIME} < \text{SPEECH TIME}$ (Klein, 1992). In single perfect configurations, the event time is the same as the reference time, which is prior to speech time. In DCP constructions, the reference time is also prior to speech time, and the DCP instantiates a temporal relationship such that the event occurs prior to the reference time. To account for this double backshift, I adopt the view that the DCP results from a backshifting operator in the aspectual layer of the clausal structure.

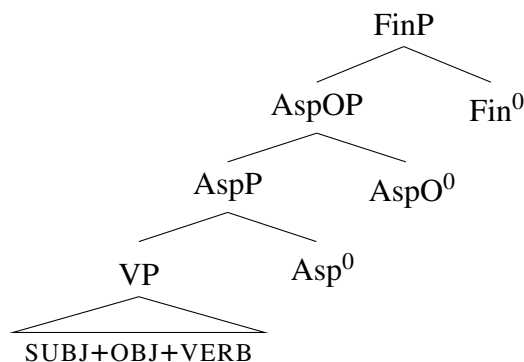
2.1 Clause structure and semantic composition

In this section, I propose a semantic composition of aspect in Swiss German. The previous section has shown that embedded clauses in Swiss German are interpreted relative to the matrix clause. In order to present a unified analysis of aspect in Swiss German, I conjecture that the temporal structure in both matrix and embedded clauses in Swiss German is uniform.

I assume a clause structure in which aspect has its own functional projection. The subject is assumed to be base-generated within the verb phrase. I propose that Swiss German does not have a tense projection, and that the case of a Double Compound Perfect or a Past Progressive results from aspect stacking.

I argue that there is no tense projection for the following reasons: Example (2a) shows that the single perfect morphology cannot co-occur with a present time adverbial. This suggests that the morphology on the auxiliary does not contribute any temporal information – contrary to e.g., English, Standard German, and Dutch. In DCP configurations, the auxiliary lacks temporal information as well, and the double backshift we see in DCPs follows from two perfect participles. Consider the structure I adopt for Swiss German in (11).

(11)



Each structural position hosts a distinct type of semantic operator. Beginning with the Verb Phrase, I adopt the view that the VP denotes a predicate of events of type $\langle v, t \rangle$. The verb itself is either of type $\langle e, \langle v, t \rangle \rangle$ (intransitive), or of type $\langle e, \langle e, \langle v, t \rangle \rangle \rangle$ (transitive), and for the

purposes of this paper, I assume that subject and object have merged with the verb before the VP merges with the aspectual layer of the clause. Example (12) shows that the VP denotes a predicate of events.¹¹

$$(12) \quad \llbracket \text{VP} \rrbracket = \lambda e_v[\text{event}(e) \ \& \ \text{Agent}(e)(x) \ \& \ \text{Theme}(e)(y)]$$

Above the VP, we find the aspectual layers. The lower aspectual head existentially quantifies over events, and then returns a predicate of times. Aspect comes in two different flavours: perfect and progressive aspect. Perfect aspect existentially quantifies over events such that the run time of the event ($\tau(e)$) precedes a time variable t' (13a). Progressive aspect existentially quantifies over events such that that the reference time is included in the run time of the event (13b).¹²

$$(13) \quad \begin{array}{l} \text{a. } \llbracket \text{PERF} \rrbracket = \lambda p_{\langle v,t \rangle} . \lambda t' . \exists e [\tau(e) < t' \ \& \ p(e)] \\ \text{b. } \llbracket \text{PROG} \rrbracket = \lambda p_{\langle v,t \rangle} . \lambda t' . \exists e [t' \subseteq \tau(e) \ \& \ p(e)] \end{array}$$

In case of aspect stacking, there is a higher aspect on top of the lower aspect. This aspectual layer cannot be of the exact same type as the lower aspect. That is, the lower aspect takes a predicate of events and returns a predicate of times. If the higher aspect had the exact same type, this would result in a type clash. Instead, it must denote functions from properties of times to properties of times $\langle \langle i,t \rangle, \langle i,t \rangle \rangle$. I adopt the denotation by Rullmann and Matthewson (2018) – although omitting world variables – who propose an aspectual layer which they call ordering aspect (AspO), which allows for aspect stacking.^{13,14}

$$(14) \quad \llbracket \text{PERF} \rrbracket_O = \lambda p_{\langle i,t \rangle} . \lambda t . \exists t' [t' < t \ \& \ p(t')]$$

Above the aspectual layers (the FinP is semantically vacuous but indicated for morphosyntactic reasons, see Section 3), the predicate of times denoted by Aspect merges with a temporal pronoun t_c (not a pronoun tense), which indicates speech time (Klein, 1994; Kusumoto, 2005). Structurally, I assume that the locus of the speech time pronoun is somewhere at the top edge of the clause. The complete structure is given in (15).

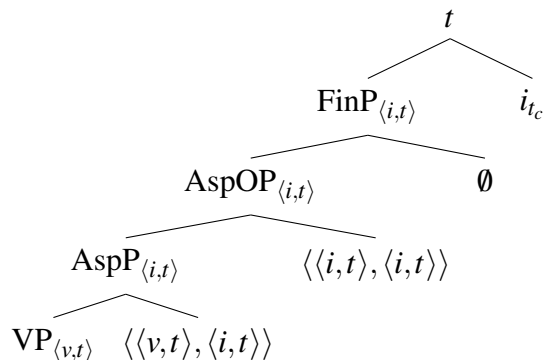
¹¹In the denotation of the verb, I give the denotation for a transitive verb. This is not crucial to the analysis. Intransitive verbs take one fewer argument and ditransitive verbs take one more.

¹²It is widely assumed in the literature that the progressive is modal (see e.g., Dowty 1977; Landman 1992; Portner 1998). I abstract away from this in this paper.

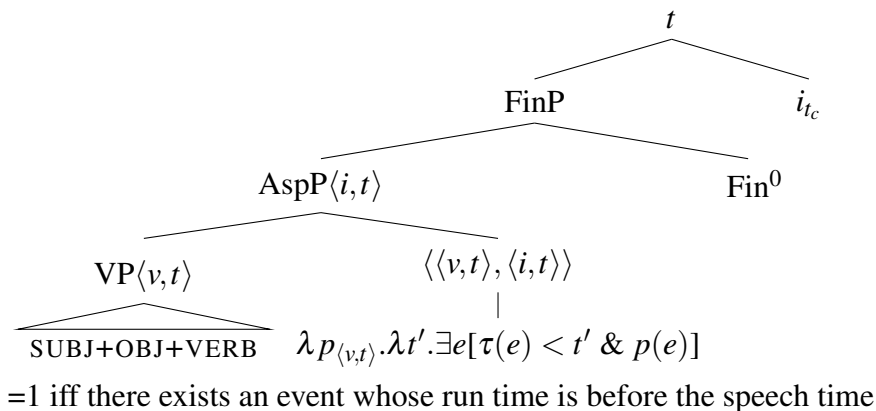
¹³Swiss German is able to express clauses with only overt person marking and without perfect or progressive aspect. These are typically interpreted with a habitual reading. Statives do not overtly have to express progressive or perfect aspect. I leave this for future research.

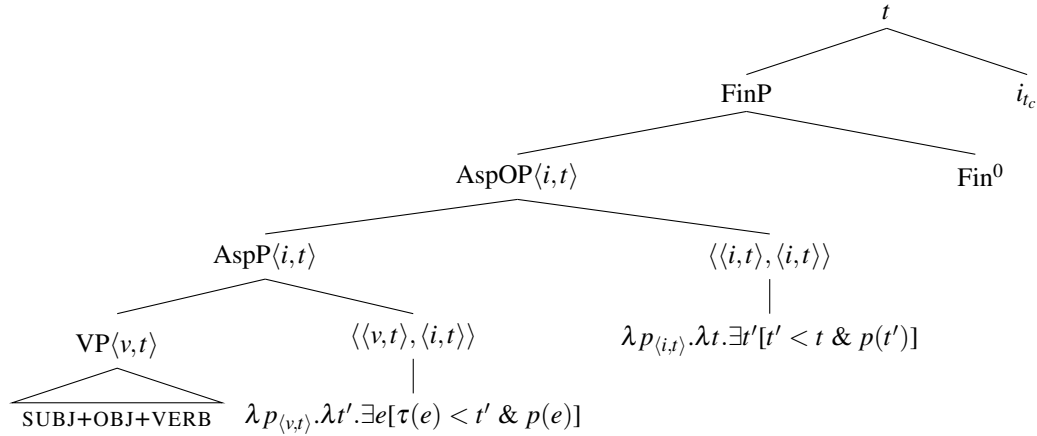
¹⁴Like in English, it is illicit to have progressive aspect as ordering aspect. While this is not explicitly ruled out by this analysis, I assume that there is a constraint that prohibits this order of aspect stacking.

(15)



Concretely, the crucial derivations for our current purposes are that of the progressive and perfect progressive, and the single and double perfect. These are derived as follows: for progressive and single perfect configurations, only the lower aspect is present. These aspectual operators merge with the predicate of events, and the predicate of times that is returned merges with the speech time pronoun. Double perfect and perfect progressive configurations have an additional aspectual layer that contains the ordering aspect. The ordering aspect is a function that introduces existential quantification over times returned by the lower aspect, and then returns another predicate of times, which then merges with the speech time pronoun. The derivation of the single perfect is given in (16), and the double perfect in (17).

(16) **Perfect**

(17) **Double Perfect**

=1 iff there exists an event, whose run time is before t' , and t' is prior to speech time

The progressive and perfect progressive are derived the exact same way as the perfect and double perfect, except that the temporal relation between the event and the time variable is different, given the progressive aspect in Asp^0 . With the positions and denotations of the aspectual operators in Swiss German that I have argued for, we have been able to derive the desired interpretations.

2.2 Taking stock

The core of the proposal is that there is no projection for tense in Swiss German, and that all temporal ordering relations in Swiss German follow from aspectual operators. There are two main arguments for this. The first argument is based on the morphology of present and double perfect configurations. In double perfect configurations, perfect morphology surfaces, and this suggests that the surface realizations of the perfect participles are exponents of the same underlying operator. Alternatively, one could argue that Swiss German shows Tense stacking, rather than aspect stacking, in which case the double perfect has two relative past tenses in one clause – this is what Klecha and Bochnak (2016) and Bochnak and Klecha (2018) argue for past perfects in Luganda, for example. However, Swiss German has progressive aspect that alternates as another participle form with the perfect, which offers support for the claim that double perfects result from underlying perfects. Altogether, the data in this paper indicate that it is hard to draw a line between tense and aspect in Swiss German. The second argument in support of the claim that Swiss German lacks a tense projection relates to time frame adverbials. Example (2a) shows that present time frame adverbials are ungrammatical in single perfect configurations, contrary to for example Standard German (Musan, 2001), indicating that the auxiliary does not contribute any temporal information, and thus does not express tense. As a result, perfect aspect is solely

responsible for the temporal ordering relation.¹⁵ Since aspectual operators are responsible for temporal ordering relations in Swiss German, all temporal ordering relations in Swiss German are relative. In matrix clauses, the temporal ordering relation is relative to a speech time pronoun (Kusumoto, 2005). In embedded clauses, the temporal ordering relation is relative to the event time of the embedding predicate, which selects a predicate of times.

A tenseless analysis has a number of implications. Swiss German is able to express temporal ordering relations that are typical of configurations with a tense in other languages, and aspect sometimes appears to be a hybrid between tense and aspect. The hybrid behavior of aspect follows from which operators combine: depending on whether there are multiple aspectual operators in the structure, perfect or progressive aspect can relate the ET to RT, or RT to UT. That is, if temporal operators are put together in a particular way, they can mimic what tense and aspect do in other systems. In perfect-progressives and double perfects, the ordering aspect seems to behave like a tense. However, the aspectual operator in the lower aspectual position unambiguously behaves like an aspect, relating the ET to the RT. Only when the ordering aspect takes the position between a lower aspectual operator and the speech time pronoun does it appear to behave like a tense.

Altogether, morphological evidence and the distribution of time frame adverbials suggest that Swiss German is tenseless. Despite its lacking tense, this analysis has shown that Swiss German can derive temporal ordering relations through how it combines aspectual operators, which ultimately relate to a speech time pronoun.¹⁶ Questions remain with respect to how the morphosyntactic facts can be explained in more detail. Particularly, we face the following questions, which I address in the next section.

- (18) i. Why does person agreement always occur on an auxiliary and not on the lexical verb?
 ii. What drives the linear order in aspect doubling configurations?

3. Morphosyntax: feature transmission

This section presents a morpho-syntactic account of the Double Compound Perfect in Swiss German. I adopt the feature transmission framework in Arregi and Klecha (2015), from which it follows naturally that the perfect participles occur in their given order, and that person and number are realized on a separate, finite auxiliary. I adopt a variant of Distributed Morphology as the relevant realizational framework (Halle and Marantz, 1994; Harley and Noyer, 1999). In this framework it is assumed that Spell-Out is a reflection of abstract features in the syntactic derivation. In Swiss German this means that the semantic denotations for the aspectual operators are mapped to a morpho-syntactic feature bundle. These feature bundles correspond to a phonological form. In the morpho-syntactic derivation,

¹⁵In my analysis, time adverbials can target the aspectual operators but not the speech time pronoun. More research is needed to explore this issue.

¹⁶This analysis is specific to Swiss German, and more research is needed to determine the cross-linguistic merits of this analysis.

each feature bundle consists of a set of two inflectional feature types: the first type is inflection class, namely aspect or finiteness. The second type is inflection form, which could be a participle (PRT) – which can be the present participle (progressive) or past participle (perfect) – or person (PERS). For progressive aspect, for example, the complete feature set is [ASP: PROG, INFL:PROG.PRT]. At the end of the derivation the phonological forms of the feature sets are realized in their terminal nodes at Spell-Out. Example (19) shows the mapping from the aspectual semantic operators to their corresponding morphosyntactic feature bundles:¹⁷

- (19) a. [ASP: PERFECT] ↔ [INFL: PERF.PRT]
 b. [ASP: PROGRESSIVE] ↔ [INFL: PROG.PRT]

In the mapping from semantics to morphology, no distinction needs to be made between the lower aspect and ordering aspect. What matters is the temporal relation indicated by the aspectual operators, which is the same for both. Thus, perfect aspect has one abstract morphological output variant. Person and number were not discussed in relation to the semantics of aspect, but person and number have a morpho-syntactic output. As person and number only appear on finite verbs, I assume that the inflection class is finiteness ([FIN]), and the inflection itself consists of person marking ([PERS]).¹⁸

- (20) [FIN:FIN] ↔ [INFL:PERS]

Building on the abstract representations of the morphology in (19) and (20), we can attest for the the attested output of single perfect, double perfect, progressive, and perfect progressive morphology through the Feature Transmission (FT) Approach in Arregi and Klecha (2015):

- (21) *Feature Transmission.*

Move an inflectional feature ([ASP:PERF/PROG; FIN:FIN; INFL:PRT/PERS]) from a finite/aspectual head to another head.

(adapted from Arregi and Klecha (2015): p. 9)

Simply put, under this definition of FT, features just keep moving from head to head. Arregi and Klecha (2015) define a number of conditions as part of their definition of FT that constrain when features can be transmitted:

- (22) *Constraints on Feature Transmission.*

Given a feature F on a head H that is transmitted to another head H':

- a. Locality: H' is the head of the complement of H.

¹⁷The morphological shape of perfect participles can differ depending on the verb: some irregular verbs do not change in form, while the participle of regular verbs can be recognized by a circumfix. Moreover, some verbs have an ablaut. I will not discuss any of these morphological details here.

¹⁸For current purposes, I collapse person and number in one feature bundle and do not further decompose person, number, and gender features on pronouns and verbal inflection.

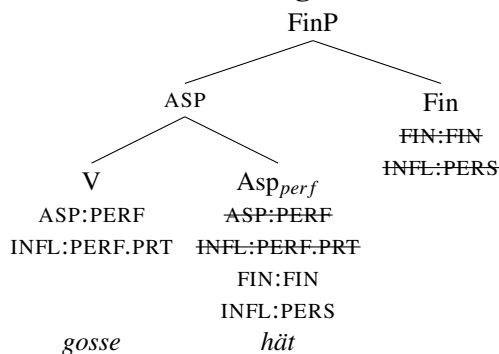
- b. Feature Conflict: H' is not specified for an inflectional feature.
- c. Cyclicity: F is transmitted as soon as H is merged.

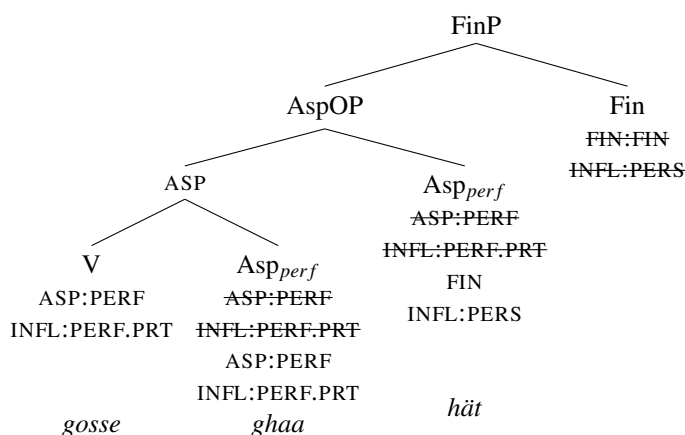
(adapted from Arregi and Klecha (2015): p. 9)

Each condition imposes specific constraints on transmission. Locality requires that features always transmit downward to the immediately following head. Consequently, if a feature is generated in the highest representation in the extended projection of the verb, it may not skip any intermediate projection, and should transmit from head-to-head. Feature conflict constrains feature stacking, since it prohibits transmission of features if a feature is already present on the lower head. This results in the blocking of feature transmission due to conflicting heads. As Arregi and Klecha (2015) describe, "[c]yclicity derives that some potential feature conflicts are circumvented in the course of the derivation" (p. 9). That is, heads can accept new features again after they have transmitted features. Feature transmission leaves no copy of the features behind, so there are no copies that can cause a feature conflict. If a feature conflict arises that cannot be resolved such that features are unable to transmit further, an auxiliary verb is inserted to host the stranded features – a form of 'to be' if the main verb is marked for progressive aspect, and a form of 'to have' if the main verb is marked for perfect aspect.

The order of transmission is "bottom-up": the VP 'looks up' in order to receive features. The lower aspectual head, the sister node of the VP, transmits its features to the verbal head in order to license them. If there is an ordering aspect, this then transmits its features. However, the verb has already been satisfied and so they cannot transmit further than the lower aspect. Lastly, Fin^0 transmits its features. Since lower aspect always transmits inflectional features to the verbal head, there is always a feature conflict by the time FinP gets merged, since other inflectional features are already present in the VP (or in Asp^0 , if there is an ordering aspect). Thus, not all features are able to transmit all the way to the VP. The finiteness features that get stranded higher up in the structure are spelled out by an inserted auxiliary that does not express any temporal information. The derivation of the progressive below illustrates how the linear order is derived through feature transmission.

(23) **Post-transmission Single Perfect**



(24) **Post-transmission Double Perfect**

What we see in the examples above is the following: the VP ‘looks up’ to aspect in order to receive features, which are then transmitted. When these features are transmitted, the features in the ordering aspect – if present – can move to the lower aspectual head. The features in the ordering aspect can never move further down to V^0 , because there are already inflectional features in V^0 and further transmission would result in a Feature Conflict. Thus, the features of the ordering aspect are stranded. If there is an ordering aspect, the finiteness features can move down to ordering aspect, but cannot move further down for the same reason: further transmission would result in a feature conflict. Without ordering aspect present, finiteness features still fail to move to the verbal head, due to the transmission of aspectual features to V^0 . As a result, there are always stranded features in the spell-out: aspectual features from the lower aspect are realized on the verb, but the features of the ordering aspect and finiteness features must be stranded due to Feature Conflict. The configuration of the double perfect gives rise to the Double Compound Perfect, as only the features in the lower aspectual head transmit to the verb and the perfect features in the ordering aspect and finiteness features get stranded on their way towards the verb. The single perfect lacks the presence of an ordering aspect, and only the finiteness features get stranded.¹⁹

Altogether, the Feature Transmission model (Arregi and Klecha, 2015) allows us to derive the DCP structure. It correctly predicts that aspect is expressed by a participle on the lexical verb, and that there is another perfect participle inserted in order to derive a double backshift – or a single backshift for perfect progressives. The lack of a tense projection results in the fact that the finite verb only inflects for person and number.²⁰

To summarize, the analysis presented is able to account for the semantics and morphosyntax of single and double perfect constructions in Swiss German. By adopting Fea-

¹⁹For reasons of space, the derivations of the progressive and perfect progressive have been omitted. These configurations are derived the same way

²⁰Sometimes *ghaa* and sometimes *gsii* surfaces at Spell-Out. I adopt the view that the choice of auxiliary is determined by the lexical verb. See Bach (1967), Bjorkman (2011) and work cited therein for a more exhaustive discussion of auxiliary selection.

ture Transmission (Arregi and Klecha, 2015) we were able to derive the attested output of matrix and embedded clauses in Swiss German. In the FT model, features housed by the functional heads in the extended projection of the VP are transmitted towards the verbal head in order to get licensed. However, feature conflicts prevent further transmission from taking place, leading to the spell-out of stranded features. Semantically, the lower Aspect takes a predicate of events and returns a predicate of times. The Ordering Aspect takes and returns a predicate of times. At the upper edge of the clause, the Aspectual layer merges with the temporal pronoun indicating speech time. At that point we yield a truth value. In embedded clauses, the feature transmission procedures are identical to that in matrix clauses.

4. Conclusion

This paper presented an analysis of double compound perfect constructions in the Zürich dialect of Swiss German, an Alemannic language spoken in Switzerland. At the heart of this proposal were constructions exemplified in (25), in which the lexical verb carries a perfect participle, while another perfect participle is also present.

- (25) Why did you arrive so late from the airport yesterday?
 D'Suzi hät ihre Koffer verlore **ghaa**
 the Suzi have.3SG her suitcase lost.PERF have.PERF
 'Suzi had lost her suitcase'

Single perfect constructions plus *ghaa* receive an interpretation with a double backshift. In this paper I presented an analysis that explains and predicts the morpho-syntactic form and semantic interpretation of the DCP. The morphological facts were straightforwardly accounted for by a Feature Transmission approach (Arregi and Klecha, 2015). Under this approach, features from the extended projection of the VP transmit cyclically to the verbal head. Transmission is constrained by Locality, Feature Conflict, and Cyclicity conditions, the interaction of which ultimately gives rise to the insertion of *ghaa* when a sentence requires a double backshift. Semantically, the different heads in the clausal spine base-generate different semantic denotations, i.e., different types of temporal relations between either the event and reference time, or the reference time and the speech time. Altogether, this account predicts both the attested semantic as well as morpho-syntactic facts of the double compound perfect in Swiss German. A question that has not been addressed is where and how frame adverbials like *geschtr* 'yesterday', and other temporally related adverbs such as *scho* 'already' and *bereits* 'already' fit in (see Altshuler, 2011 on temporal adverbials). While it was beyond the scope of this paper, a logical next step would be to extend this analysis to the incorporation of temporal adverbs.

References

- Abusch, Dorit. 1988. Sequence of Tense, Intensionality, and Scope. In *Proceedings of WCCFL 7*. 1–14.
- Abusch, Dorit. 1997. Sequence of tense and temporal de re. *Linguistics and philosophy* : 1–50.
- Altshuler, Daniel Gordon. 2011. Toward a more fine-grained theory of temporal adverbials. In *Semantics and linguistic theory*, vol. 21. 652–673.
- Arregi, Karlos and Peter Klecha. 2015. The morphosemantics of past tense. In *Proceedings of the 45th conference of the north east linguistics society*.
- Bach, Emmon. 1967. Have and be in English syntax. *Language* : 462–485.
- Barbiers, Sjef. 2008. Microvariation in syntactic doubling—an introduction. In *Microvariation in syntactic doubling*. Brill, 1–34.
- Bjorkman, Bronwyn Alma Moore. 2011. *Be-ing default: The morphosyntax of auxiliaries*. Ph.D. thesis, Massachusetts Institute of Technology.
- Bochnak, M Ryan, Vera Hohaus, and Anne Mucha. 2019. Variation in tense and aspect, and the temporal interpretation of complement clauses. *Journal of Semantics* 36(3): 407–452.
- Bochnak, M Ryan and Peter Klecha. 2018. Temporal remoteness and vagueness in past time reference in luganda. *African linguistics on the prairie* : 377.
- Brandner, Ellen. 2008. 12: Patterns of doubling in Alemannic. In *Microvariation in syntactic doubling*. Brill, 351–379.
- Brandner, Ellen, Martin Salzmann, and Gerhard Schaden. 2016. Zur Syntax und Semantik des doppelten Perfekts aus alemannischer Sicht [the syntax and semantics of the double perfect from an alemannic perspective]. *Syntaktische Variation: Areallinguistische Perspektiven* : 13–46.
- Chen, Sihwei, Jozina Vander Klok, Lisa Matthewson, and Hotze Rullmann. 2020. The ‘experiential’ as an existential past. *Natural Language & Linguistic Theory* : 1–50.
- Dowty, David R. 1977. Toward a semantic analysis of verb aspect and the english ‘imperfective’ progressive. *Linguistics and philosophy* 1(1): 45–77.
- Halle, Morris and Alec Marantz. 1994. Some key features of distributed morphology. *MIT working papers in linguistics* 21(275): 88.
- Harley, Heidi and Rolf Noyer. 1999. Distributed morphology. *Glott international* 4(4): 3–9.
- Klecha, Peter and M Ryan Bochnak. 2016. Temporal remoteness and relativity. *Proceedings of NELS46* .
- Klein, Wolfgang. 1992. The present perfect puzzle. *Language* : 525–552.
- Klein, Wolfgang. 1994. *Time in language*. Psychology Press.
- Koenenman, Olaf, Marika Lekakou, and Sjef Barbiers. 2011. Perfect doubling. *Linguistic Variation* 11(1): 35–75.
- Kratzer, Angelika. 1998. More structural analogies between pronouns and tenses. In *Semantics and linguistic theory*, vol. 8. 92–110.
- Kusumoto, Kiyomi. 1999. *Tense in embedded contexts*. Ph.D. thesis, University of Massachusetts at Amherst.
- Kusumoto, Kiyomi. 2005. On the quantification over times in natural language. *Natural language semantics* 13(4): 317–357.
- Landman, Fred. 1992. The progressive. *Natural language semantics* 1(1): 1–32.
- Musan, Renate. 2001. The present perfect in German: outline of its semantic composition. *Natural*

- Language & Linguistic Theory* : 355–401.
- Ogihara, Toshiyuki. 1995. Double-access sentences and reference to states. *Natural Language Semantics* 3(2): 177–210.
- Pancheva, Roumyana and Arnim von Stechow. 2004. On the present perfect puzzle. In *Proceedings of the northeast linguistics society*, vol. 34. 469–484.
- Partee, Barbara Hall. 1973. Some structural analogies between tenses and pronouns in English. *The Journal of Philosophy* 70(18): 601–609.
- Poletto, Cecilia. 2009. Double auxiliaries, anteriority and terminativity. *The Journal of Comparative Germanic Linguistics* 12(1): 31–48.
- Portner, Paul. 1998. The progressive in modal semantics. *Language* : 760–787.
- Rullmann, Hotze and Lisa Matthewson. 2018. Towards a theory of modal-temporal interaction. *Language* 94(2): 281–331.
- Salzmann, Martin and Gerhard Schaden. 2019. The syntax and semantics of past participle agreement in Alemannic. *Glossa: a journal of general linguistics* 4(1).
- von Stechow, Arnim. 2009. Tenses in compositional semantics. *The expression of time* 129: 166.