Argument Structure and Reflexivity:
Middle Constructions in German[1]

Markus Steinbach
University of Mainz

1. Introduction

In German, middle constructions are syntactically common transitive sentences with a reflexive pronoun in the position of the accusative (or direct) object. This is illustrated in example (1):[2]

(1)	Dieses Buch	liest	*(sich)	leicht
	this book-NOM	reads	RP-ACC	easily
	"This book reads easily"			

In this respect they differ from their Dutch and English counterparts, which are intransitive sentences. On the other hand, middle constructions (MCs) in German are very similar to MCs in most Indo-European languages. It is a widespread phenomenon that (weak) reflexive pronouns are used in middles (and related constructions) to indicate valency reduction. Middle marking reflexive pronouns can be found in very different languages.

In this paper we focus on the thematic interpretation of MCs in German. We investigate MCs in the more general context of transitive reflexive sentences. The main

---

1 We would like to thank Artemis Alexiadou, Marie Christine Erb, Hans-Martin Gärtner, Jörg Meibauer, Juliane Möck, Ralf Vogel, and the audience and the organizers of the TLS 1999 conference.

2 The morphosyntactic realization of the MC differs from language to language, but its semantics is very homogeneous across languages. Therefore, we do without translations in most of the following examples. The respective German MCs are interpreted like MCs in English and other languages. RP stands for reflexive pronoun, NOM for nominative, and ACC for accusative. Note furthermore that most of the examples are attested. Sentence (4.d), for instance, is taken from Fontane's *Irrungen, Wirrungen*. Example (4.a) is due to Marie Christine Erb, example (9.a) to Marga Reis, and example (28.a) to Manfred Bierwisch.

question we try to answer will be: why does the accusative reflexive pronoun indicate valency reduction?

In section 2 we start off small and enlarge the picture of the middle step by step. First, we briefly discuss the basic syntactic and semantic properties of MCs in German. Second, we illustrate that dative objects are excluded from middle formation. Only the reflexive pronoun in the position of the accusative object indicates valency reduction in MCs. Third, we show that this property of reflexive pronouns is part of a larger picture. Example (1) illustrates that MCs in German are transitive reflexive sentences (TRSs). However, the middle is not the only interpretation available for TRSs. In addition to the middle interpretation, TRSs can also yield a reflexive, an anticausative, and an inherent reflexive interpretation. The reflexive pronoun is ambiguous in TRSs: it can but need not be interpreted as a semantic argument of the verb. Section 3 offers a uniform analysis of all four interpretations of TRSs. The ambiguity of the accusative reflexive pronoun is derived at the interface between syntax and semantics. This analysis is based on a slightly modified version of binding theory and the distinction between structural and oblique case. The middle interpretation of TRSs results from the following two operations: (i) the subject and the reflexive pronoun form an A-chain in syntax. This chain is interpreted as one semantic argument linked to the second argument position of the verb. (ii) The first (implicit) argument of the verb is bound by the generic operator in semantics. It follows from the analysis proposed in this paper that MCs exist neither in the syntax nor in the lexicon in any theoretically interesting way. The middle is one of four possible interpretations available for TRSs.

2. Reflexive Pronouns as Indicators of Valency Reduction

First, we take a closer look at the syntactic and semantic properties of MCs and their essential parts: the verb, the reflexive pronoun, the syntactic subject, the adverbial, and last but not least the implicit argument. In a second step we look at dative objects and compare MCs with related constructions in order to obtain a coherent picture of the syntax and semantics of TRSs in German.

2.1. Middle Constructions

We already mentioned that MCs in German require a reflexive pronoun in the position of the accusative object. However, this reflexive pronoun does not introduce an argument variable of its own into the semantic representation of the sentence. This can be seen in example (2).

(2)	Deine Bücher	verkaufen sich		gut
	Your books-NOM	sell	RP-ACC	well

In the MC (2) the syntactic subject is interpreted as the second (or internal) argument of the verb - i.e. the entity that is sold. The reflexive pronoun seems to be a kind of 'place-holder' for (the interpretation of) the syntactic subject. The first (or external) argument of the verb *verkaufen* ('sell'), the person who is selling, is not realized in syntax. It is only implicitly present in the semantic representation of the sentence. In this respect a MC equals its corresponding passive.

(3)	Deine Bücher	werden	gut	verkauft
	Your books-NOM	are	well	sold
	"Your books are well sold"			

Nevertheless, passives differ in syntax as well as in semantics from MCs. First of all, passives must not have a reflexive pronoun in the position of the accusative object. The syntactic subject of a passive needs no 'place-holder' in object position. Second, the implicit subject of passives normally receives an existential interpretation whereas the implicit subject of MCs is interpreted generically. Third, only MCs usually need some additional adverbial modification like, for instance, *easily* and *well* in (1) and (2). Note, however, that we also find MCs without adverbial modification. MCs with negation like (4.a) are perfectly acceptable without an adverbial. The same holds for questions and subjunctives (cf. 4.b and c), and in some contexts, MCs are even grammatical without any adverbial modification as can be seen in (4.d).

(4)	a.	... und Tabellen,	die sich	nicht	drucken
		... and tables	that RP-ACC	not	print
		"...and tables, that cannot be printed"			
	b.	Welche Bücher haben	sich verkauft?		
		Which books have	RP-ACC sold?		
	c.	Mein Buch könnte	sich verkaufen		
		My book might	RP-ACC sell		
	d.	Jetzt ist es schwer.	Aber es vergißt sich		alles
		Now is it hard.	But it forgets RP-ACC		everything-NOM
		"Now it is hard. But everything will be forgotten"			

In (Steinbach 1998) we argue that the occurrence of an adverbial follows from conditions for assertions to be pragmatically licensed (cf. also Ackema & Schoorlemmer 1994). Hence, adverbial modification is not crucial for the grammaticality of MCs. We come back to the last two issue (generic quantification and adverbial modification) in section 3.3.

In contrast to MCs in English, their German counterparts are always syntactically transitive. In addition, German has a so-called impersonal MC derived from one-place predicates. Impersonal MCs are also transitive with a reflexive pronoun in the position of the accusative object. In impersonal MCs the reflexive pronoun is bound by an impersonal subject (the third person neuter personal pronoun *es* 'it').[3] In German both unergative und unaccusative verbs are grammatical in impersonal MCs. This is illustrated in (5) and (6) respectively.

---

[3] As opposed to impersonal MCs like (ii), the impersonal passive in (i) must not have a syntactic subject.

(i)	Hier wird (*es)	geschlafen	vs.	(ii)	Hier schläft *(es) sich gut
	Here PASS it-NOM slept				Here sleeps it-NOM RP well

This difference might be due to the fact that the accusative reflexive pronoun must be bound in syntax (cf. section 3 below) or to the fact that in German an EPP-feature must be checked in active but not in passive sentences. We will see below that MCs are common active transitive sentences.

(5) Es schläft sich gut in diesem Bett
It-NOM sleeps RP-ACC well in this bed

(6) Gesundheitsstudie: In welchem Bezirk stirbt es sich am frühesten
Study-on-health: In which district dies it-NOM RP-ACC at-the earliest

The impersonal subject *es* is not a semantic argument of the verb, i.e. it does not introduce an argument variable into the semantic representation. Again the reflexive pronoun indicates valency reduction. The only argument of the one-place verb is suppressed and cannot be linked to the subject position. Example (6) illustrates another property of MCs in German. The suppressed argument need not be the actor or agent of the verb/event. The only argument of unaccusative verbs has typical patient properties. Further examples are two-place verbs like *finden* ('find') in (7) or *vergessen* ('forget') in (4.d). In both cases the suppressed argument is neither an actor nor an agent.

(7) ... ein Telefonbuch fand sich nicht
... a phonebook found RP not
"... a phonebook could not be found"

We can conclude that nearly all kinds of verbs can undergo middle formation. We find one-, two-, and three-place predicates, as well as unaccusatives, unergatives and two-place verbs without an actor or agent argument. Only weather verbs like *regnen* ('rain'), which do not select an argument at all are ungrammatical in MCs.[4] So far there is only one condition on middle formation: the verb must subcategorize for at least one semantic argument. This is summarized in observation (8).

(8) Reflexive pronouns indicate valency reduction in MCs. The first argument of a verb is not linked to syntax

2.2. Dative Objects and Dative Reflexive Pronouns

The reflexive pronoun in MCs is bound by the subject (in impersonal MCs by the impersonal subject *es*). Like the third person reflexive pronoun, the first and second person reflexive pronouns also indicate valency reduction in MCs.

(9) a. Du_1 verkaufst $dich_1$ gut - Ich meine: dein $Buch_2$ verkauft $sich_2$ gut
You sell RP-2.SG well - I mean: your book sells RP-3.SG well
b. Ich schreibe mich mit 'st'
I write RP-1.SG with 'st'
"My name has to be written with 'st'"

We saw that middle formation in German is quite unrestricted. There is, however, one crucial restriction: dative objects must not be promoted to subject position in MCs. The subject of a MC cannot correspond to a dative object in the 'active' counterpart. This is

[4] Individual-level predicates like *abstammen* ('be descended from') or *heißen* ('be called') are also ungrammatical in MCs. We will see below that the generic operator binds the implicit argument and the event-variable in MCs. Individual-level predicates are excluded from middle formation because they do not subcategorize for an event variable.

illustrated in the following examples. Sentence (10.b) is ungrammatical if the reflexive pronoun is assigned accusative case and it does not yield a middle interpretation if it is assigned dative case.[5] A verb selecting a dative object can only occur in impersonal MCs like (10.c). In this case, the dative object preserves its case and the accusative reflexive pronoun again indicates valency reduction.

(10) a. Wir helfen einem Obdachlosen
We help a homeless-person-DAT
b. Ein Obdachloser hilft sich leicht
A homeless-person-NOM helps RP-*ACC/DAT easily
c. Einem Obdachlosen hilft es sich leicht (impersonal MC)
A homeless-person-DAT helps it RP-ACC easily

Hence, dative reflexive pronouns cannot indicate valency reduction in MCs. The same holds for accusative and dative reflexive pronouns assigned case by a preposition. Both sentences in (11) can only yield a reflexive reading: the reflexive pronouns must be interpreted as an argument coreferent with the subject of the sentence. The reflexive pronouns cannot indicate valency reduction.

(11) a. Peter_1 ist sehr von sich_1 überzeugt
Peter is very of himself-DAT convinced
"Peter is very sure of himself"
b. Er_1 hat mich auf sich_1 aufmerksam gemacht
He has me to himself-ACC call-attention made
"He called my attention to himself"

By replacing (8) with (12) we can state our observations more precisely.

(12) Only a reflexive pronoun in the position of the accusative (or direct) object indicates valency reduction in MCs

2.3. Transitive Reflexive Sentences

In this subsection, we turn to related constructions. We already saw that MCs are TRSs, i.e. transitive sentences with a reflexive pronoun in the position of the accusative object. Apart from the middle interpretation, TRSs can also get a reflexive interpretation, an anticausative interpretation, and an inherent reflexive interpretation. All four readings a TRS can have are given in (13).

(13) a. Herr Rossi wäscht sich (reflexive interpretation)
Mr Rossi-NOM washes RP-ACC
"Mr. Rossi is washing himself"

---

[5] In the third person, dative and accusative reflexive pronouns are homonymous, but the first and second person singular are clearly morphologically marked for dative (*mir* and *dir*) and accusative (*mich* and *dich*). Therefore, sentence (10.b) yields a grammatical representation if *sich* is understood as a dative reflexive pronoun. In this case, we do not get the middle interpretation but the reflexive interpretation 'a homeless person helps himself (easily)' (cf. also next subsection).

b.	Dieses Brot schneidet sich	leicht	(middle interpretation)
	This bread-NOM cuts RP-ACC easily		
	"This bread cuts easily"		
c.	Das Fenster	öffnet sich	(anticausative interpret.)
	The window-NOM	opens RP-ACC	
	"The window opens"		
d.	Herr Rossi erkältet	sich	(inherent refl. interpret.)
	Mr. Rossi-NOM catches-a-cold RP-ACC		
	"Mr. Rossi is catching a cold"		

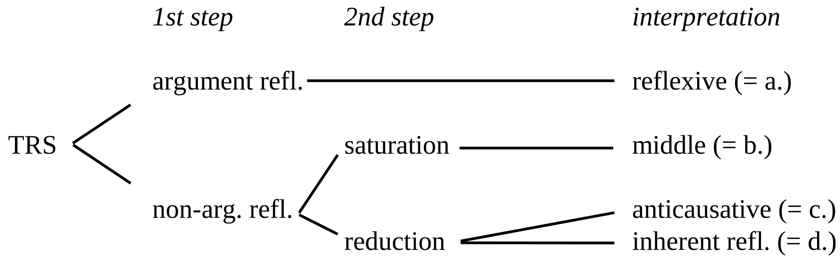
The reflexive interpretation in (13.a) differs from the remaining three in one respect. In (13.a) the reflexive pronoun is interpreted as a semantic argument of the verb coreferent with the subject. Both, the subject and the object introduce an argument variable of their own into the semantic representation. In (13.b-d), on the other hand, the reflexive pronoun is not an argument of the verb but an indicator of valency reduction. The syntactic subject is linked to the second argument position of the verb. In this case, the verb's first argument is not linked to syntax. We call the reflexive pronoun in (13.a) *argument reflexive* and the one in (13.b-c) *non-argument reflexive*. This ambiguity of (weak) reflexive markers can be found in many Indo-European languages. The corresponding (simplified) thematic interpretations of all four sentences are given in (14) (x is the implicit argument in MCs and ∅ stands for the deleted first argument in anticausatives and inherent reflexives).

(14)	a.	$W < r_1, r_1 >$	W = waschen, r = Rossi	(reflexive interpr.)
	b.	$S < x, b >$	S = schneiden, b = Brot	(middle interpr.)
	c.	$O < \emptyset, f >$	O = öffnen, f = Fenster	(anticausative int.)
	d.	$E < \emptyset, r >$	E = erkälten, r = Rossi	(inh. refl. interpr.)

Beside this ambiguity of the reflexive pronoun, another ambiguity is responsible for the interpretations in (14.b) to (14.d). If the non-argument interpretation is chosen, the first semantic argument of the verb is not linked to syntax and can either be saturated (i.e. bound by some operator) or reduced (i.e. completely removed from the semantic representation). Argument reduction is obviously the more restrictive operation and yields the anticausative (14.c) and inherent reflexive interpretation (14.d). Anticausatives are semantically one-place predicates derived from underlying two-place predicates.[6] Argument saturation is less restrictive and can be applied to almost all verbs selecting at least one argument. The resulting reading is the middle interpretation in (14.b). We come back to these two operations in section 3. The interpretation of TRSs is systematically illustrated in figure 1 below:

[6] The same holds for inherent reflexives. They are also derived from underlying two-place representations. As opposed to anticausatives, the first argument of inherent reflexives is, however, obligatorily reduced. Hence, inherent reflexive verbs are inherently anticausative. In this context we cannot discuss the question whether this can be derived from the semantics of inherent reflexives or whether they are idiomatic expressions. In the following discussion we subsume inherent reflexives under anticausatives because both are derived by the same underlying operation.

(15) Figure 1: the interpretation of transitive reflexive sentences:



The reflexive pronoun in TRSs is either an argument or a non-argument reflexive. Hence, it can but need not indicate valency reduction. In conclusion we can state our observations more precisely again. The final version is given in (16).

(16) Only a reflexive pronoun in the position of the accusative (or direct) object is ambiguous between an argument and a non-argument interpretation

The ambiguity of reflexive pronouns in German is finally illustrated in figure 2. We call the reflexive pronoun in the position of the accusative object a morphosyntactic middle marker (cf. Kemmer 1993). In German we find a clear correlation between the reflexive pronoun and the middle marker. However, figure 2 also illustrates that reflexivity cannot be reduced to middle voice and vice versa. In this respect German equals most Indo-European languages, which also indicate valency reduction by means of weak reflexive pronouns.[7]

(17) Figure 2: middle markers and reflexive pronouns in German

middle marker		
inher.reflexive interpr. anticausative interpr. middle interpretation		
reflexive interpretation	reflexive interpretation	**reflexive marker**
ACC-RP in TRS	DAT-RP, P+ACC/DAT-RP	

All four interpretations of TRSs do not differ in syntax. The argument as well as the non-argument reflexive is subject to the same constraints on word-order in the middle field (cf. Fagan 1992; Steinbach 1998, 1999). Moreover, both the argument and the non-argument reflexive differ from elements that appear preferably adjacent to the verb. This is illustrated in (18). Example (18.d) is anticausative, i.e. *sich* is a non-argument reflexive.

(18) a. ... weil sich Heidi immer davongeschlichen hat
because RP-ACC Heidi always sneaked-off has
"Because Heidi always sneaked off"
b. *... weil sich Heidi davon immer geschlichen hat

[7] The morphosyntactic properties of middle markers as well as their possible interpretations vary from language to language. Some languages express passive by means of weak reflexive pronouns, others don't (e.g. German). Besides, German is a one-form language that does not distinguish between weak and strong reflexive pronouns. German has only one form of reflexive pronouns, which must be used in both contexts (cf. Kemmer 1993; Steinbach 1998).

c. *... weil die Tür immer sich geöffnet hat
because the door always RP-ACC opened has
"Because the door was constantly opening"
d. ... weil sich die Tür immer geöffnet hat

There is no empirical evidence to distinguish argument form non-argument reflexives in the syntax.[8] We assume that the different meanings of TRSs do not correspond to different syntactic representations. In the following section we show that all four interpretations of TRSs can be derived from one underlying syntactic representation.[9]

3. The Interpretation of Reflexive Pronouns in Middle Constructions

We derive the difference between argument and non-argument reflexives at the interface between syntax and semantics. The second ambiguity (cf. step 2 in figure 1 above) results from two different operations of valency reduction on implicit arguments. Before we turn to the ambiguity of TRSs we briefly introduce the basic theoretical concepts. Our analysis is based on the binding theory of (Reinhart & Reuland 1993) and (Pollard & Sag 1994). We assume that the binding principles should be defined relative to semantic predicates. Binding theory has, however, also a syntactic part, which will be outlined in the following subsection. In subsection 3.2. we derive the ambiguity of the reflexive pronoun and in subsection 3.3. we discuss the interpretation of the implicit argument in anticausatives, MCs and passives. Finally, we turn to dative objects in German in 3.4.

3.1. A-chains and the [+R] and [-R] Distinction

We follow the idea of (Reinhart & Reuland 1993) that binding has a syntactic and a semantic part. We assume that reflexive pronouns can either be bound syntactically or semantically depending on their inherent specification. As opposed to other pronominal

---

[8] There are some differences between argument and non-argument reflexives. Only the former can be focussed, fronted, and coordinated. (i) illustrates the restriction concerning focus. The non-argument reflexive in MCs like (i.b) must not be focussed whereas the argument reflexive in (i.a) can be focussed.

(i) a. Peter rasiert SICH$_F$ vs. b. *Das Buch verkauft SICH$_F$ gut
Peter shaves RP The book sells RP well

(Fagan 1992) and (Steinbach 1998, 1999) show that these differences follow from the semantic ambiguity of the reflexive pronoun in TRSs. Following recent theories on focus (cf. e.g. Rooth 1992), a constituent can only be focussed if it introduces a variable into the semantic representation. But we will see below that the non-argument reflexive does not introduce a variable itself. Hence, no focus semantic value can be generated and sentence (ii) is ungrammatical. Similar arguments hold for coordination and fronting - for discussion see (Steinbach 1998).

[9] A detailed discussion of the shortcomings of theories that try to derive MCs (and other TRSs) in the lexicon or in the syntax can be found in (Steinbach 1998, chapter 3). So far no uniform analysis of the syntax and semantics of TRSs has been suggested.

elements, the Φ-features of reflexive pronouns are maximally underspecified.[10] Therefore, reflexive pronouns are not specified for the morphosyntactic feature [R].

(19) Reflexive pronouns are not lexically specified for the feature [R]

All other pronominal and nominal elements are inherently specified as [+R]. Reflexive prononuns can either be [+R] or [-R] depending on the syntactic context.

More crucial for the syntactic part of binding theory (and the ambiguity of TRSs) is the concept of maximal A-chains. A well-formed maximal A-chain is a sequence of coindexed syntactic arguments that must not contain more than one [+R] expressions (cf. Reinhart & Reuland 1993 and especially Fox 1993). The definition of maximal A-chains is given in (20):

(20) a. *Maximal A-chains*:
A *maximal A-chain* is any sequence of coindexation of syntactic arguments that satisfies antecedent government

b. *General Condition on A-chains (GCC)*:
A maximal A-chain (α_1, ... ,α_n) contains exactly one link - α_1 - that is both [+R] and case-marked.

A syntactic argument is every NP that is assigned (or checks) structural case. Nominative and accusative are structural cases in German. We come back to the distinction between structural and oblique case in subsection 3.4. According to (20), every well-formed A-chain must contain exactly one [+R] expression, its head. Hence, every syntactic argument that is specified as [+R] must head its own maximal A-chain. On the other hand, every syntactic argument that is specified as [-R] must be antecedent-governed by another syntactic argument specified as [+R] to satisfy the GCC in (20.b). In the next subsection we illustrate that the GCC in combination with the assumption that reflexive pronouns are not specified for the feature [R] enables us to derive the thematic ambiguity of TRSs (step 1 in (15) above).

3.2. Argument vs. Non-Argument Reflexives

First, we analyse a simple transitive sentence like (21) without a reflexive pronoun as an illustration.

(21) a. Emanuela trägt grüne Socken
Emanuela wears green socks

---

[10] Reflexive pronouns are always less specified than personal pronouns. All reflexive pronouns lack nominative case and the specification for gender. Furthermore, the third person reflexive pronoun is not specified for number and case. The differences between the third person personal pronoun *ihr* and the corresponding reflexive pronoun *sich* are illustrated in (i) and (ii):

(i) *ihr* {[+s. -p.], [-1.p -2.p +3p], [-masc +fem -neuter], [-nom -acc +dat]}
(ii) *sich* {[∅], [-1.p -2.p +3p], [∅], [-nom +acc +dat]}

We assume that the subject and the object move to the specifiers of AgrS and AgrO respectively to check their case features. Hence, A-movement creates two maximal A-chains in (21) - for sake of simplicity we omit CP and verb movement in our examples.

(21) b. $[_{AgrSP}$ Emanuela$_1$ $[_{AgrOP}$ grüne Socken$_2$ $[_{VP}$ t_1 $[_{V'}$ t_2 trägt]]]]
chain 1 = Emanuela$_1$ - t_1 ; chain 2 = grüne Socken$_2$ - t_2

Both chains are headed by a [+R]-expression and every chain introduces an argument variable into the semantic representation. A-chains are interpreted in their base (or tail-) position. Chain 1 is interpreted in VP-Spec, the VP-internal subject position. This position is linked to the *first* argument of the two-place verb *tragen* ('wear'). Chain 2 is linked to the *second* argument of the verb via its tail t_2 in the complement-position of V. This can be seen in (21.c - e).[11]

(21) c. $T < x, y >$
d. $\lambda y\ (T < x, y >)(s) \rightarrow T < x, s >$
e. $\lambda x\ (T < x, s >)(e) \rightarrow T < e, s >$

The resulting interpretation is (21.e). The predicate *tragen* is a relation between the person who is wearing something, i.e. the first argument *Emanuela*, and the entity that some person wears, i.e. the second argument *grüne Socken*. A sentence with two [+R]-expressions (and two maximal A-chains) necessarily contains two semantic arguments. The same holds for the reflexive interpretation of TRS illustrated in (22) - RP means reflexive pronoun.

(22) a. Herr Rossi wäscht sich
b. $[_{AgrSP}$ Herr Rossi$_1$ $[_{AgrOP}$ sich$_2$ $[_{VP}$ t_1 $[_{V'}$ t_2 wäscht]]]]
chain 1 = Herr Rossi$_1$ - t_1 ; chain 2 = RP-[+R]$_2$ - t_2

In this case, the lexically underspecified reflexive pronoun is specified as [+R]. Again we get two maximal A-chains, which are interpreted in their base positions parallel to example (21). Reflexive pronouns specified as [+R] are interpreted as argument reflexives.

(22) c. $W < x, y >$
d. $\lambda y\ (W < x, y >)(RP) \rightarrow W < x, RP >$
e. $\lambda x\ (W < x, RP >)(r) \rightarrow W < r, RP >$

We mentioned above that the binding principles are defined relative to semantic predicates along the line of (Pollard & Sag 1994). According to Pollard & Sag, a reflexive pronoun must be bound by a less oblique coargument of the same predicate. The first argument in (22) binds the reflexive pronoun in the second argument position because it is less oblique. We receive the final semantic representation in (22.g) after applying λ-abstraction on the antecedent (cf. Reinhart 1983). All arguments coindexed with the antecedent are converted into variables bound by the λ-operator.

---

[11] In the following examples, we treat DPs as individual type variables. The variable *e*, for instance, refers to *Emanuela* and the variable *s* to *grüne Socken*. *T* stands for the two-place predicate *tragen* ('wear').

(22) f. $W < r, RP > \quad \rightarrow \quad W < r_1, RP_1 >$
g. $W < r_1, RP_1 > \quad \rightarrow \quad \lambda x \ (W < x, x >) (r)$

What happens in MCs and anticausatives? Here the reflexive pronoun is specified as [-R] and is interpreted as non-argument reflexive. If a reflexive pronoun specified as [-R] checks structural case, i.e. accusative, it must be antecedent-governed by another syntactic argument that is specified as [+R] to meet the GCC in (20.b). The syntactic subject *das Brot* ('the bread') antecedent-governs the accusative reflexive pronoun *sich*. Therefore, the MC in (23) contains only one complex maximal A-chain, which consists of the subject and the reflexive pronoun in object position. This complex A-chain fulfils the GCC because it is headed by a [+R]-expression.

(23) a. Das Brot schneidet sich leicht
b. $[_{AgrSP}$ Das $Brot_1$ $[_{AgrOP}$ $sich_1$ $[_{VP}$ leicht $[_{VP}$ t_1' $[_{V'}$ t_1 schneidet]]]]
chain 1 = das $Brot_1$ - t_1 - RP-$[-R]_1$ - t_1

This maximal A-chain is interpreted in its base position parallel to chain 2 in the examples (21) and (22). The syntactic subject is linked to the second argument of the verb via the trace t_1 in the complement-position of V:[12]

(23) c. $S < x, y >$
d. $\lambda y \ (S < x, y >) (b) \quad \rightarrow \quad S < x, b >$

In example (23) the first argument of the verb is not linked to syntax. It can be either saturated or reduced. We discuss both operations in the next subsection. So far we conclude that the ambiguity of TRSs is due to the underspecification of reflexive pronouns, which are not specified for the feature [R]. Therefore, reflexive pronouns can either be [+R] or [-R]-expressions resulting in two different syntactic representations. The [+R]-specification corresponds to the argument reflexive, the [-R] specification to the non-argument reflexive. In the first case, the accusative reflexive pronoun must head its own chain and is interpreted as the second argument of the verb (reflexive interpretation). In the second case, it cannot be the head of an A-chain and must be part of another complex A-chain dominated by a [+R]-expression, i.e. the subject of the sentence. Hence, the reflexive pronoun does not introduce an argument variable of its own into the semantic representation and the subject DP is linked to the second argument of the verb via the VP-internal base-position of the reflexive pronoun. That's why the reflexive pronoun can be called a 'place-holder' in MCs and anticausatives.

---

[12] Impersonal MCs can be derived along the same lines. The (well-formed) maximal A-chain consists of the impersonal subject *es*, a [+R]-expression, and the reflexive pronoun. The impersonal subject is not interpreted as an argument of the verb. Hence, the maximal A-chain does not introduce an argument variable at all. The first (and only) argument of the verb is not linked to syntax. It is only implicitly present.

3.3. Implicit Arguments

In the previous section we derived the first ambiguity of TRSs, i.e. step 1 in figure 1 above. We saw that a [-R]-specification yields the non-argument interpretation for the reflexive pronoun. This interpretation results in another ambiguity, which is illustrated under step 2 in (15). Two different operations on the implicit argument in (23) are responsible for this second ambiguity. The implicit argument is a free variable that can either be bound by a semantic operator or completely removed from the semantic representation. (Chierchia 1989) calls these two operations argument saturation and argument reduction. They can be defined in the following way:

(24) Saturation: $(\lambda y\ \ P < x, y >)\ (a) \quad \rightarrow \quad (\lambda y\ Op\ x\ \ P < x, y >)\ (a)$
Reduction: $(\lambda y\ \ P < x, y >)\ (a) \quad \rightarrow \quad (\lambda y\ \ P < y >)\ (a)$

Argument reduction yields the anticausative and inherent reflexive interpretations and argument saturation the middle interpretation. Argument reduction is much more restricted and depends on the lexical meaning of the verb. The class of verbs that permit reduction is a subclass of the verbs that permit saturation. It seems to be the case that we can only reduce arguments that are not necessarily intentional.

(25) a. Peter/ dieser Schlüssel/ der Sturm öffnete die Tür
Peter/ this key /the storm opened the door
b. Die Tür öffnete sich (anticausative)
c. Peter/ *dieser Pinsel/ *der Wind malte das Bild
Peter/ this brush/ the wind painted the picture
d. *Das Bild malte sich (anticausative)

(25.a) shows that the first argument of verbs like *öffnen* ('open') need not act intentionally and we expect argument reduction to be grammatical (cf. 25.b). Verbs like *malen* ('paint'), on the other hand, select an intentional first argument. (25.d) illustrates that the anticausative interpretation is impossible in this case. The first argument of verbs like *malen* cannot be reduced.

Argument saturation yields the middle interpretation. In this case, an operator binds the free argument variable. Free variables usually refer to a specific entity or they yield a 'global' generic interpretation.[13] We assume that the free variable can be bound either by the existential quantifier or by the generic operator. The first option yields the passive interpretation and the second one the middle interpretation. Example (26) illustrates this for the passive in (3) above and example (27) for the corresponding MC (2).

(26) a. Deine Bücher werden gut verkauft
Your books are well sold
b. $\exists x\ \exists s\ \ (V\ (s\ \ < x, b >)\ \&\ G(s))$ (passive)

---

[13] Sentences with implicit objects as well as indefinite pronouns like *einer* ('one') show the same ambiguity. Example (i), for instance, can either describe an event where Hans-Martin is now reading something fast (e.g. a letter) or it means that he generally reads things fast.

(i) Hans-Martin liest schnell
Hans-Martin reads fast

(27) a. Deine Bücher verkaufen sich gut
Your books sell RP-ACC well
b. **GEN**[s,x] (V (s < x, b >); G (s)) (middle)

In some Indo-European languages like e.g. Russian or Modern Greek passives and MCs are morphosyntactically identical. Existential and generic quantification are two possible interpretations for the same sentence. German shows a division of labour with respect to the interpretation of the implicit first argument. Passives are responsible for the existential interpretation whereas the generic interpretation is associated with MCs. However, in certain contexts MCs can yield an interpretation that is very similar to the one of passives. This is especially the case when we explicitly narrow down the range of quantification for the generic operator. The interpretation of the MC in (28.a) is almost identical to the one of the passive in (28.b).

(28) a. 1968 verkaufte sich diese Cont. Exec. Limousine immerhin 56 mal
(In) 1968 sold RP this Cont. Exec. limousine at least 56 times
b. 1968 wurde diese Cont. Exec. Limousine immerhin 56 mal verkauft
(In) 1968 was this Cont. Exec. limousine at least 56 times sold
"In 1968 this Cont. Exec. limousine was sold at least 56 times"

We want to conclude this subsection with a brief remark on adverbial modification. We argued that MCs involve generic quantification. Hence, they express something that people usually can do with some entity. MCs without any adverbial modification like *dieses Buch liest sich* ('this book reads') or *dieses Brot schneidet sich* ('this bread cuts') simply state that this book can usually be read or that this bread can normally be cut. But this information is part of our knowledge about books or bread: books are made for reading and bread can normally be cut. Hence, MCs without adverbial modification are only informative in very special contexts. This does not hold for the corresponding passives because they refer to specific events of reading or cutting. That a book was actually read by someone does not follow from the fact that it usually can be read (or that it is made for reading). Therefore, unlike MCs passives are informative without any adverbial modification (for further discussion see Steinbach 1998).

3.4. Dative Reflexive Pronouns

Finally we would like to turn to the problem of dative objects. We already saw that dative objects cannot undergo middle formation or, to put it the other way round, dative reflexive pronouns are not middle markers in German (in (29) we repeat example (10.b)).

(29) Ein Obdachloser hilft sich leicht (*middle interpr.)
A homeless-person-NOM helps RP easily

Dative reflexive pronouns cannot indicate valency reduction. In subsection 3.1. we illustrated that only syntactic arguments specified as [-R] indicate valency reduction. The notion of syntactic argument is relevant for the definition of maximal A-chains in (20.a). But how can the notion of syntactic argument be defined in German?

(Fanselow & Felix 1987) and (Vogel & Steinbach 1998) argue that German distinguishes structural (object) case from oblique (object) case. Nominative and accusative are structural, whereas dative case is oblique. The notion of syntactic argument can be defined on the basis of structural case.

(30) Only NPs that are assigned structural case are syntactic arguments

In German this distinction between structural and oblique case is independently motivated. Dative case differs from nominative and accusative in many respects. As opposed to accusative and nominative, dative case is morphologically marked. Movement into case positions is an exclusive property of accusative (A.c.I.) and nominative (passive). Moreover, dative objects cannot be promoted to subject in MCs and in tough-movement constructions. Accusative objects can bind dative objects but not vice versa. Furthermore, German has so-called free and multiple datives but no free and multiple accusatives or nominatives. Further differences concern constraints on word order, sentential complements, idioms, and processing asymmetries - for more details see (Vogel & Steinbach 1998; Steinbach 1998; Bader et.al. 1996).

We conclude that dative case is oblique. Therefore, dative objects are never structural arguments and they cannot be subject to the GCC. Reflexive pronouns in the position of the dative object cannot be bound by the subject in syntax. They always introduce an argument variable into the semantic representation, which must be bound by a less oblique coargument, either the nominative subject or the accusative object (cf. 3.2 above).

However, we already saw that verbs subcategorizing for a dative object can occur in impersonal MCs. Example (10.c) is repeated in (31):

(31) Einem Obdachlosen hilft es sich leicht (impersonal MC)
A homeless-person-DAT helps it RP-ACC easily

In this case, the dative object 'keeps' its case and is interpreted parallel to the dative object in the corresponding 'active' sentence. The impersonal subject is not an argument of the verb as in other impersonal MCs. But the accusative reflexive pronoun indicates valency reduction of the first argument, which is not linked to syntax.

4. Conclusion

In this paper we propose a uniform analysis of all four interpretations TRSs can have in German. This analysis is based on the following two assumptions: (i) (weak) reflexive pronouns are not specified for the feature [R] and (ii) German distinguishes between structural and oblique case. Both assumptions are independently motivated. The first assumption seems to be valid crosslinguistically whereas the second one is language specific. We do not think that all languages draw similar distinctions between structural and oblique case. On the other hand, (weak) reflexive pronouns universally seem to be the less specified pronominal elements although they have quite different morphosyntactic properties in different languages. In addition, various languages use (weak) reflexive pronouns to indicate valency reduction. It seems to be a universal property that the less specified elements need not be interpreted as semantic arguments.

Furthermore, we argued that middles are one possible interpretation of TRSs. They can be derived from TRSs in two steps: first, the [-R] non-argument reflexive does not introduce an argument variable of its own and second, the implicit first argument of the verb is bound by the generic operator. Hence, we can do without the notions of middle-verbs or middle-syntax in German. Neither a special middle syntax nor a lexical operation of middle formation is necessary.

References

Ackema, Peter & Maaike Schoorlemmer. 1994. The middle construction and the syntax-semantics interface. *Lingua 93*. 59-90.

Ackema, Peter & Maaike Schoorlemmer. 1995. Middles and nonmovement. *Linguistic Inquiry 26*. 173-197.

Bader, Markus et.al. 1996.. Case-assignment in processing German verb-final clauses. *MIT Occasional Working Papers in Linguistics 9*.

Bierwisch, Manfred. 1996. 'Fragen' zum Beispiel. In *Wenn die Semantik arbeitet*, Gisela Harras & Manfred Bierwisch (eds.) Tübingen: Niemeyer Verlag. 361-378.

Chierchia, Gennaro. 1989. A semantics for unaccusatives and its syntactic consequences. Ms. Cornell University.

Fagan, Sarah. 1992. *The syntax and semantics of the middle construction*. Cambridge: Cambridge University Press.

Fox, Danny. 1993. A modification of Reinhart and Reuland's 'Reflexivity'. Ms. MIT, Cambridge/Mass.

Haider, Hubert. 1982. Von sein oder nicht sein: zur Grammatik des Pronomens 'sich'. In *Erklärende Syntax des Deutschen*, Werner Abraham (ed.) Tübingen: Narr Verlag.

Kemmer, Susanne. 1993. *The middle voice*. Amsterdam: Benjamins.

Pollard, Carl & Ivan Sag. 1994. *Head-driven phrase structure grammar*. Stanford: CSLI Publications.

Reinhart, Tanja. 1983. *Anaphora and semantic interpretation*. London: Croom Helm.

Reinhart, Tanja & Eric Reuland. 1993. Reflexivity. *Linguistic Inquiry 24*. 650-720.

Rooth, Mats. 1992. A theory of focus interpretation. *Natural Language Semantics 1*. 75-116.

Schachtel, Stefanie. 1991. Der Akkusativ in der Medialkonstruktion. In *Strukturen und Merkmale syntaktischer Kategorien*, Gisbert Fanselow & Sascha Felix (eds.) Tübingen: Narr. 104-120.

Steinbach, Markus. 1998. Middles in German. The syntax and semantics of transitive reflexive sentences. PhD Dissertation, Humboldt University at Berlin.

Steinbach, Markus. 1999. Unaccusatives and anticausatives in German. Ms. University of Mainz (to appear in *Studies on unaccusativity*, Artemis Alexiadou et. al. (eds.) Amsterdam: Benjamins.)

Vogel, Ralf & Markus Steinbach. 1998. The dative — an oblique case. *Linguistische Berichte 173*. 65-90.

Markus Steinbach
Johannes Gutenberg Universität
FB 13 — Deutsches Institut
55033 Mainz
e-mail: steinbac@mail.uni-mainz.de