The acquisition of negation

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1. Introduction

The acquisition of negation has fascinated researchers since the early child language studies in the beginning of the last century and has been a fruitful topic of inquiry ever since. This might have to do with the clash between the perplexing complexity of negation in natural languages on the one hand and the observation that children start to use negation early and apparently without major problems on the other. A word for negation is typically one of the first words children learn, and, often to the regret of their care-givers, it is also "one of the most consistently used words throughout the single-word utterance period" (Pea 1980: 178). These early negation words differ from most other early words in that they are inherently relational in nature. As early as 1928, Stern and Stern already noticed the head start of *no* and equivalents, which typically also precede their affirmative counterpart (*yes*) in child language. Once children leave the one-word stage and start to master more complex syntactic constructions, negation plays a leading role again. It is one of the first clausal operators that children productively use.[1]

The first language (L1) acquisition of negation is not an immediate development, however. Children's early negation words do not cover the whole array of negative meanings found in adult language. The language specific lexical differentiation negation words and their integration into fuller utterances takes time.

Questions regarding the acquisition of negation as one of the first clausal operators are particularly interesting since we are dealing with developing systems. It is not the case that children just have to learn how to add negation to otherwise complete sentences. They have to learn how to express negation given the current state of their learner language.

This is equally true for second language (L2) acquisition later in life. The main difference between the two types of acquisition lies in the avail-

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[1] In many languages, additive particles like *too* are attested equally early (Dimroth 2009, Penner et al. 2000).

ability of knowledge about the function of negation. Adult L2 learners are experienced language users who "know" about the different functions of negation from their L1, but are often struggling with their formal expression in the target language.

Children do not only have to understand how to negate sentences, they must also learn that negation can affect (or have scope over) different parts of sentences and leave others unaffected. Adult L2 learners, on the other hand, might again "know" these principles from their L1. What both groups have to learn is what the meaning is of different negation words, which ones are used in given syntactic contexts and how the scope of negation is signaled in the target language. L1 and L2 learners thus have different starting points, and the developmental patterns observed vary as a function of this knowledge, and also as a function of the specifics of the (source and) target language.

Whereas the literature on the role of negation in L1 acquisition has covered the entire developmental process, studies on the L2 acquisition of negation are often more selective. In particular, studies have focused on the interaction between negation and other properties of sentence grammar that seem to pose related problems to the learner. For example, it has been shown that the acquisition of negation – in particular the placement of negation words – depends to a large degree on the acquisition of finiteness (Becker 2005, Meisel 1997, Verhagen and Schimke 2009). In many contributions, negation has thus not been studied in its own right, but rather as a window into structural development in other domains (most prominently, in studies on the acquisition of syntax, as a measure of verb raising).

This overview focuses on core issues relating to the acquisition of meaning and form of negation in L1 and briefly compares the main findings to the evidence available from L2. Single-word negation, anaphoric negation, clausal negation, and constituent negation are covered, whereas the acquisition of negative polarity items, negative concord, and negative word formation are not. To date, the acquisition of negation in a large array of target languages has been studied. Table 1 provides a selective overview.

Table 1. Studies on L1 or L2 acquisition of negation in different target languages

Target language	Acquisition type	Sources
ASL	L1	Anderson and Reilly 1997
Cantonese	L1	Tam and Stokes 2001
Dutch	L1	Jordens 1987, van der Wal 1996
	L2	Jordens 1987, Verhagen 2009
English	L1	Bloom 1991, Cameron-Faulkner et al. 2007, Choi 1988, Clahsen 1988, Drozd 1995, Felix 1987, Harris and Wexler 1996, Klima and Bellugi 1966, Pea 1980
	L2	Cancino et al. 1978, Giuliano 2003, Milon 1974, Perdue et al. 2002, Silberstein 2001, Wode 1981
Finnish	L1	Bowerman 1973
French	L1	Choi 1988, Clark 1985, Meisel 1997, Verrips and Weissenborn 1992, Weissenborn et al. 1989
	L2	Giuliano 2003, Meisel 1997, Perdue et al. 2002, Schimke 2008, Véronique 2005
German	L1	Clahsen 1988, Drenhaus 2002, Felix 1987, Hummer et al. 1993, Meisel 1997, Schaner-Wolles 1995/96, Stromswold and Zimmermann 1998, Verrips and Weissenborn 1992, Weissenborn et al. 1989, Wode 1976
	L2	Becker 2005, Dietrich and Grommes 1998, Meisel 1997, Parodi 2000, Dimroth 2008, Schimke 2008
Hebrew	L1	Weissenborn et al. 1989
Hungarian	L1	Barbarczy 2006
Italian	L1	Volterra and Antinucci 1979
	L2	Bardel 1999, Bernini 2000
Japanese	L1	Clancy 1985, Ito 1981, McNeill and McNeill 1973, Sano 1998, Wakabayashi 1983
Korean	L1	Choi 1988, Hahn 1981
Latvian	L1	Rūķe-Draviņa 1972
Mandarin	L1	Lee 1982
Polish	L1	Smoczyńska 1885
Russian	L1	Snyder and Bar-Shalom 1998
Swedish	L1	Lange and Larsson 1973
	L2	Hyltenstam 1977
Tamil	L1	Ramadoss and Amritavalli 2007, Vaidyanathan 1991
Turkish	L1	Aksu-Koç and Slobin 1985

It is not possible to summarize the findings on the acquisition of negation in these different languages, but cross-linguistic variation will be discussed where it becomes important for more general issues, e.g. the question of whether it is easier to acquire different functions of negation if there is a different negation word for each of them, or the question of whether word order regularities in a given language influence the acquisition process.

Section 2 deals with developmental patterns in the L1 acquisition of negation and covers research on children's acquisition of negative meanings (2.1) and forms (2.2), thereby focusing on the acquisition of lexical items (2.2.1) and their position in the sentence in relation to their scope (2.2.2). Section 3 compares these findings to what is known about negation in L2 acquisition and presents similarities (3.1) and differences (3.2). For the reasons mentioned above it focuses on formal properties of negative utterances, in particular the acquisition of lexical items and their position and scope properties. Section 4 presents some conclusions.

2. Developmental patterns in L1

This section summarizes findings from the acquisition of meaning and form of negation, focusing on orders of acquisition and their implications for L1 development.

2.1. How children acquire the functions of negation

Young children start to express negation before they actually learn to speak, but their early negation gestures and words do not yet cover the entire array of negative meanings available in adult language. It is widely accepted that development starts with affective or volitional functions of negation like the ones that have already been described by Stern and Stern (1928). These authors concluded "Das erste *nein* des Kindes bedeutet nicht „nein, das ist nicht so", konstituiert also nicht ein negatives Urteil, sondern es bedeutet: „nein, es soll nicht so sein", „nein, das will ich nicht", „nein, das sollst du nicht tun", stellt also eine abwehrende Stellungnahme dar" (p. 267).[2] Stern and Stern also found that the development from here to the acquisition of truth-functional negation often takes several months.

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[2] "Children's first *no* does not mean 'no, this is not the case' and thus does not constitute a negative judgment, but means 'no, it should not be like this', 'no, I don't want that', 'no, you should not do this', and therefore presents a rejecting statement."

Since this early distinction of the two extreme points in this development (from affective/volitional to truth-functional), researchers have applied a more fine-grained matrix. In particular, many studies have addressed the question of whether there is developmental continuity between the early affective functions of negation and the higher order logical or truth-functional negation (Pea 1980: 157). This has given rise to methodological discussions, since the sequential development of negative meanings does not necessarily equal the order of acquisition of negative expressions. As long as children do not make formal distinctions it is unclear if different meanings correspond to psychologically real semantic categories in their conceptual system (Cameron-Faulkner et al. 2007: 275).

As a consequence it is unclear how many categories should be distinguished and quite a few different taxonomies have been suggested. Table 2 shows the relatively fine-grained classification proposed by Choi (1988) as an example because it also includes negative meanings emerging relatively late.

Table 2. Categories for a classification of early negative meanings (following Choi 1988)

Category	Description	Example
NONEXISTENCE	child's expectation of the presence of an entity at a particular place or time was not met	*allgone X/X allgone*
FAILURE	negates occurrence of a specific event	*not work, not fit*
REJECTION	negation of object or action present in the context	*not eat*
PROHIBITION	negation of others' action present in the context	*no!*
DENIAL	negated proposition represented in the interactants verbal assertion	*is this a car? – no, that's a pony*
INABILITY	child negates a physical ability	*I can't*
EPISTEMIC NEGATION	child negates possession of knowledge	*I don't know*
NORMATIVE NEGATION	discrepancy between state of affairs and the child's expectations (norms) of the objects involved	*him (= horse) can't go on a boat*
INFERENTIAL NEGATION	involves inference about listener – no overt assertion precedes the child's negation	*I not broken this*

Given the difficulties in distinguishing these different types in particular in the early phases of acquisition, other researchers have collapsed some of the categories. A review of a variety of studies reveals that the following three broader categories are widely used (e.g. Pea 1980, Hummer et al. 1993).[3]

A. REJECTION/REFUSAL
B. DISAPPEARANCE/NONEXISTENCE/UNFULFILLED EXPECTATION
C. DENIAL

The following survey on the acquisition of negative meanings from early nonverbal behavior up to the one word stage is based on this tripartite distinction.

2.1.1. Functions of negation expressed up to the one-word stage

Cross-linguistic evidence suggests that REJECTION/REFUSAL is the first semantic category of negation children are able to express (Pea 1980). It comprises children's expressions of rejection of an external object or action as well as those of refusal to comply with a request. Before they start to speak young children can push an undesired object away or turn their head in order to express this function. Rejection is also the first type of negation that surfaces in speech: The first form used for this function in English is the word *no*, but gestural messages persist later (Guidetti 2005). As Horn (1989: 166f.) points out there are many extra-linguistic ways of expressing meanings like rejection or disappearance, and even when expressed in speech, these meanings do not require the presence of overt morpho-syntactic negative markers. For example, an earlier negative statement can be rejected by means of a positive utterance. Studies of the acquisition of negative meanings have widely ignored these possibilities and focused on overt negation in gesture and speech.

The early acquisition of rejection is probably due to its simplicity. Rejection typically applies to holistic actions or events and the topic of this type of negation has no need for internal representation, because it is always present in the context.

The second negative function that is typically attested in children's gestures and speech refers to expressions of DISAPPEARANCE or of NON-EXISTENCE. The latter type always involves the non-existence of an ex-

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[3] A different order of acquisition has been found for negative meanings expressed in multi-word speech (e.g. Bloom 1970; see next section).

pected entity and is therefore often seen as related to negation occurring in the context of UNFULFILLED EXPECTATIONS (Pea 1980). The reason why this type of negation appears later than instances of rejection is seen in the fact that denying the presence of something requires an abstract cognitive representation of the relevant object (Pea 1980). This type of negation has therefore been studied in relation to the development of object permanence. Tomasello and Farrar (1984) found a clear relation between this cognitive ability and the emergence of what they called "absence-relational words" (1984: 486) such as *allgone*, but also *more, find, another*.

The last function of negation to appear developmentally is DENIAL, used to negate the truth of a statement, in the beginning mainly statements expressing facts in the world. Denial or truth-functional negation is acquired relatively late because it requires that children can simultaneously represent two mental models, one representing the true state of the world and one representing its false counterpart (Hummer et al. 1993).

Volterra and Antinucci (1979) focus on children's pragmatic development and assume that they have to learn how to negate "a corresponding positive presupposition attributed to the listener" (p. 283). At first the information which the child presupposes and then negates is always available in the ongoing event or the immediately preceding utterance. Later the child must reconstruct such presuppositions internally because they become less recoverable from situational cues in the context. Pea (1980: 31), however, argues convincingly that Volterra and Antinucci's (1979) emphasis on the role of the addressee's presupposed beliefs would overburden the inferencing capacities of pre-two-year-olds.

These issues cast doubts on the assumption that the first occurrences of denials (between 1;8 and 1;11 according to Hummer et al. 1993) really indicate that children have acquired higher order truth-functional negation (Pea 1980). Can we assume that this acquisition gets by without intermediate steps or is there a more continuous developmental progression from rejection and disappearance negation to the truth-functional negation of statements?

Gopnik and Melzoff (1985) assume that the expression of failure of plans can serve such a bridging function, because it occurs also in child monologues and is thus no longer bound to social action. Hummer et al. (1993) cite cross-linguistic support for a more continuous development that comes from the acquisition of languages using different lexical items for rejection and higher order negation. There is some evidence that words used for early pre-logical negation are later over-generalized for the expression

of denials, where the target language would use another negation word (e.g. Clancy 1985 on Japanese, Vaidyanathan 1991 on Tamil).

A number of studies (Drozd 1995, Hummer et al. 1993) suggest in addition that what superficially looks like denial is actually often expressing a kind of metalinguistic negation (for an overview see Horn 1989: chapter 6). Hummer at al. (1993) study children's negative answers to yes/no questions involving a wrong comment (e.g. *Is this a cow?* while pointing to the picture of a dog). The authors suggest that children's denials in such a context need not be interpreted as instances of truth-functional negation, but could instead mean something like "your utterance violated the rules of the naming game" (Hummer et al. 1993: 617). Context analyses of spontaneously occurring denials likewise show that young children often use these in order to reject another person's use of language that is inappropriate in their eyes (Drozd 1995). Early denials might thus not be instances of truth-functional negation but rather they may be similar to the earlier functions expressing unfulfilled expectations with respect to a habitual norm of language use. Hummer et al. (1993) conclude that "there seems to be empirical evidence for the developmental emergence of the concept of falsity from a much more inclusive category of disagreement. (…) most children below five are not able to differentiate between false statements (…) and anomalous statements." (p. 617).

Even though there are still open questions concerning the exact cognitive prerequisites and the number of intermediate developmental steps one can conclude that new meanings emerge when progress in cognitive development allows more abstract topics to be negated. The different negative meanings are acquired in a relatively invariant sequence (Pea 1980), whereas individuals differ as to which lexical items they use to express the same meanings and in the meanings most prevalent their language use.

2.1.2. Functions of negation expressed in multi-word speech

So far we have been concerned with acquisition orders of negative meanings that children express with gestures or negative lexical items used in isolation. Interestingly, slightly different orders of acquisition have been found in multi-word speech, where what is negated is expressed verbally and not inferred from the (extra-)linguistic context. There is converging evidence from several languages (Choi 1988 on English, Korean, and French, McNeill and McNeill 1973 on Japanese, Bloom 1970 on English) that NON-EXISTENCE (and not REJECTION) is the first semantic category of ne-

gation to be expressed in multiword speech. Table 3 summarizes Bloom's (1970: 172–173) findings.

Table 3. Negative meanings in multi-word speech (following Bloom 1970)

Category	description	example
NONEXISTENCE	referent not manifest in context, where it was expected	*no pocket*
REJECTION	existing or imminent referent rejected or opposed by the child	*no dirty soup*
DENIAL	an actual or supposed predication was not the case	*adult: there's the truck child: no truck ('this isn't a truck')*

Choi (1988) assumes that rejection is expressed later than nonexistence in multiword speech. Children's early one-word utterances are sufficient for the rejection of objects or actions that are salient in the context. This is different for disappearance and nonexistence where children comment about objects that are not or no longer directly evident in the context. There is thus more pressure on further formal development, and the first word combinations involving negative items are thus often of the type *no X* / *X no* or *allgone X* / *X allgone*.

In isolated occurrences as well as in connected speech it is assumed that children's acquisition of new forms often lags behind their acquisition of new functions.[4] Bloom (1991) proposes that this might be due to properties of English as a target language where meaning differences are blurred because several types of negation can occur with the same negative form. As a consequence, researchers have hypothesized that target-like form-function mapping is acquired more rapidly if the different negative meanings are covered by different lexical items (Cameron-Faulkner et al. 2007: 255). The evidence from the acquisition of languages with such properties is mixed, however. McNeill and McNeill (1973) studied the acquisition of semantically contrasting negative items in Japanese. They found that children established the relevant semantic contrasts from early on, even though they did not always take all relevant semantic features into account. Rūķe-Draviņa (1972) on the other hand reports that children acquiring Latvian

[4] Compare also the discussion of overextended forms in Choi (1988: 530) and Pea (1980: 107).

used the available three different negation words in free variation despite their semantic contrast.

Direct comparisons involving unrelated target languages (e.g. Choi 1988) reveal a relatively large overlap between the developmental patterns. This suggests that the preconditions for the expression of different types of negation that are linked to young children's general cognitive development play a greater role for the acquisition of negative functions than the structure of the input language. Cross-linguistically children initially negate only events that they do not have to refer to linguistically because they are present in the immediate context. Only later do they learn to make negative comments about non-present objects or actions. The expression of denial requires even more abstract representation and thus appears even later. In a first step children seem to use denial in order to signal that their interlocutors' use of language in a concrete situation does not correspond to their expectations. Researchers agree that adult-like truth-functional negation is the last major semantic category that children acquire.

2.2. The formal expression of negation in child language

This section is devoted to the acquisition of formal properties of negation. It deals with the influence of the syntactic context on the choice of lexical items and with the position of the negators in children's utterances. Out of all the negative meanings discussed in the previous section, the relevant studies have mainly focused on the form of denials. An additional important distinction is the one between anaphoric and sentential (clausal) negation. Anaphoric negation relates to the content of an earlier utterance. It can occur in isolation or preceding an utterance that is following the negated one (*This is red. No, this is orange.)*. Sentential negation applies its negative meaning to the utterance in which it occurs, instead of to an earlier one (*This is not red*).[5] Many of the target languages studied have a special lexical item for sentential negation, but it can sometimes not easily be distinguished from anaphoric negation in child language. This distinction is important because the question of whether children treat anaphoric and sentential negation differently (lexical items, positions) has played a crucial role in the debate on the acquisition of forms of negation, both with respect to lexical and with respect to syntactic development.

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[5] The term 'sentential negation' does, however, not imply that we are dealing with full sentences. The negated utterances can be elliptical or (in particular in learner language) otherwise incomplete.

2.2.1. The acquisition of negative lexical items: anaphoric vs. sentential negation

Cross-linguistic evidence shows that children's first negation words typically correspond to the form of the adult anaphoric negator, presumably because this form often occurs in isolation or at least in sentence external position and is therefore more salient in the input. It is an open question, however, if the adult anaphoric negator is used for anaphoric negation only. Wode (1976) claims that there is a presumably universal developmental stage at which children use the anaphoric negative also for sentential negation.

More recent data speak against the universality of such a stage. French anaphoric *non*, for example, is never used for sentential negation: "children have a sentence external position for *non* and a sentence internal one for sentential negation with *pas*" (Weissenborn et al. 1989: 28; see also Choi 1988).

For other target languages the picture is not as clear. With respect to German, for example, there are contradicting claims concerning the occurrence of *nein* as a sentential negator (thus replacing the target-like *nicht*). Weissenborn et al. 1989 find some examples in their data (see example 1), but claim that these occurrences do not cluster in the transition phase between anaphoric and sentential negation, and are therefore unlikely to constitute a distinct acquisitional stage.

(1) *Nein ich putt mache*
No I kaputt make (Simone 2;2)

Deprez and Pierce (1993) on the other hand maintain that there is a phase during which children systematically overuse *nein* for sentential negation, sometimes even in utterance internal position; cf. example 2.

(2) *Ich nein schlafen*
I no sleep (from Felix 1987)

These authors assume that the phenomenon is not due to the overgeneralization of early anaphoric negation, but that learners tend to overuse the negative item with least phonetic complexity. Stromswold and Zimmermann (1998) point out that these contradicting findings are mainly due to the methodological difficulty of distinguishing sentential from anaphoric negation. They present a careful context analysis of the available transcripts and come to the conclusion that the vast majority of all potentially sentential negatives occurred with *nicht*. In German the picture is thus not as clear as in French, but there does not seem to be a stage in child language develop-

ment at which *nein* would be systematically replacing *nicht* or at which both negators would occur in free variation.

The acquisition of English presents a different picture again. A classic study by Klima and Bellugi (1966) found that there was indeed a first stage at which anaphoric *no* and sentential *not* were used in free variation in contexts of sentential negation (see also Harris and Wexler 1996). In a later step *n't*-negators were added to the repertoire (starting with unanalysed *can't* and *don't*) and only after that children distinguished between *no* and *not* in an adult-like way.

Wode (1976: 100) assumes that the long period of confusion between *no* and *not* in English is due to the phonological resemblance between these negation words that makes it difficult for children to analyze and distinguish the relevant lexical items in the input. Whereas children learning other languages overcome this learning problem quite rapidly and start consistently using the target language's item for sentential negation, the acquisition of English shows a more gradual development.

Cameron-Faulkner et al. (2007) collected a dense longitudinal database of one English speaking child aged 2;3–3;4 and found that *no* and *not* did not actually occur interchangably as was assumed by Klima and Bellugi (1966). Although there was some overlap, the use of *no* for sentential negation (e.g. *no move, no reach*) was found to decrease at the age of 2;6 while the use of *not* in similar contexts (e.g. *not lose it, not play, not reach*) started to increase at around the same time and became the dominant negator by 3;0 (Cameron-Faulkner et al. 2007: 267). The distribution of negation in this big corpus shows that there is no stage of completely random distribution, but rather that children distinguish the two negators at least quantitatively. The authors suggest that the input frequency is responsible for *no* being the first negator used by the child. Once *no* is established as a familiar negator the child keeps relying on this established form and uses it also for multiword negation (*no X*) instead of imitating existing multi-word combinations in the input.[6] This would correspond to a conservative learning strategy according to which new functions are first expressed by old items (Choi 1988), but one wonders why this is the case in some languages more than others (compare the evidence for French and German above). These findings concerning the acquisition of lexical items for sentential negation and the role that the earlier anaphoric negators play in this process are tightly linked to another important issue: the acquisition of a position for sentential negation.

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[6] This also presents an interesting challenge to the usage-based approach to language acquisition that Cameron-Faulkner et al. (2007) put forward.

2.2.2. The acquisition of word order and a position for negation

This section deals with the acquisition of word order in negated sentences. The focus of the research has again been on sentential negation, but here the term is not only used in contrast to anaphoric negation but also in contrast to constituent negation. Negation not only reverses the truth-value of a sentence, but additional means (e.g. word order, prosody, special lexical items) can be used to indicate which part of the negated sentence is incompatible with its positive counterpart (Klein, submitted). In some cases these additional means identify only one particular constituent as the incompatible part of the sentence. With the exception of some comprehension studies mentioned in the end of this section, such narrow scope cases have not been studied extensively in child language. Most studies have focused on so-called sentence negation instead, the most neutral case in which the entire sentence or at least the entire VP is in the scope of negation.

How do children integrate their newly acquired negation words into their utterances at the beginning of the multi-word stage? Longitudinal data from children learning English and German have been studied quite intensively because they exhibit a systematic use of non adult-like structures in the early stages of acquisition, in particular the so-called 'Optional Infinitive Stage' (see Jordens 2002; Wexler 1994, and the discussion below). Based on data from Bloom (1970), Klima and Bellugi (1966), Felix (1978) and Wode (1976), Felix (1987: 98) provides the following overview for the development of sentence negation in English and German.

Table 4. Stages in the development of sentence negation in English and German

English	German
Stage I (Neg + S)[7]	
no the sun shining	*nein hauen* (don't bang)
no Daddy hungry	*nein schaffe ich* (I can't manage)
no see truck	*nein spielen Katze* (I don't want to play with the cat)
Stage II (*no*/*nein* + VP)[8]	
Kathryn no like celery	*ich nein schlafen* (I don't sleep)
I no reach it	*das nein aua* (that doesn't hurt)
man no in there	*ich nein hat eins* (I don't have one)

[7] This corresponds to stage IIb in Wode (1977), who includes additional earlier phases in his model.

[8] See the discussion in the preceding Section concerning the use of *nein* for sentential negation.

Stage III (*not*/*nicht* + V; *don't* + V, V + *nicht*)	
Kathryn not go over there	*Eric nicht schlafen* (E. doesn't sleep)
I don't go sleep	*ich nicht essen mehr* (I don't eat more)
this one don't fits	*Henning brauch nicht Uni* (H. doesn't have to go to the university)

Whereas Felix's Stage II ('Neg + VP') is restricted to the negator *no* for English, other researchers maintain that early occurrences of forms like *can't* and *don't* in utterance internal position should equally be counted under stage II (see examples below). At this time, however, these are used as unanalysed holophrases, and their positive counterparts (*can, do*) do not yet occur.

(3) *I can't catch you*
I don't know his name

When *don't, can't* and later *won't* and *didn't* are used as negatives at Stage III the positive versions *do, can*, and *will* also occur, which suggests that children can analyse *don't* as *do* + *not*. In fact, nonthematic verbs are now always correctly negated, but children still sometimes omit the auxiliary and the copula and then use the negator *not* to express negation as in the following examples.

(4) *I not hurt him*
This not ice cream

Clark and Clark (1977) point out that the age at which children reach these developmental stages varies tremendously. They compared the development of the children Adam, Eve, and Sarah and found that Stage III was reached by Adam at 3;0, by Eve at 2;0, and by Sarah at 3;5.

With respect to the orders of acquisition summarized in Table 4, two major issues have given rise to further investigations. The first issue has to do with the evidence for sentence external negation at Stage I (Bloom 1991; Drozd 1995, Stromswold and Zimmerman 2000). The second issue relates to the reasons for the variability that is observed at Stage III (pre-verbal *not* vs. *don't* in English; pre-verbal vs. post-verbal *nicht* in German) and its relation to the acquisition of finiteness. We will take these issues up in turn.

2.2.2.1. Is there a development from external to internal positions of sentential negators?

According to a number of studies on the acquisition of English and German (see above) the first multi-word structure children use in order to express sentential negation is one in which the negator is placed in a sentence external position, preceding the negated sentence in the majority of cases. A variety of reasons for the occurrence of negation in this position have been put forward. McNeil and McNeill (1973) assume that such a sentence external position is a spell out of the basic ("deep structure") position for sentence negation. In English the negator has to be moved into its target-like sentence-internal surface position. No such movement is necessary in Japanese, where negation always appears in its sentence final basic position and children do not produce any deviant word orders.

Klima and Bellugi (1966) suggest that the reason for sentence external positions of negation is that children avoid interruptions in the core part of the sentence, while Wode (1977) assumes that the 'Neg + S' structure is due to the overgeneralization of a pattern that children encounter in anaphoric contexts in the adult input. Slobin (1985: 1239) proposes that children put negation in sentence initial position because they want to indicate "that the scope of negation should be the proposition, as indicated by the verb or the clause as a whole, rather than any particular nonverbal lexical item within the clause".

An explanation in a very similar vein is offered by Van Valin (1991). If these early negators have the whole proposition in their scope, the most natural place for them to occur is outside their scope domain. Importantly, Van Valin (1991: 22) assumes that external negation is likely to occur at a time in development when such propositions do not yet show an internal structure, but are rather unanalyzed holophrases.

These are plausible explanations, and some of them would also work hand in hand. The problem is, however, that a number of other studies have challenged the idea of a 'Neg + S' stage altogether. The most prominent opponent is probably Bloom (1991) who claims that "a stage of sentence external negation in early acquisition is a myth" (p. 144).

Bloom's main argument is that what looks like external negation is in the majority of cases an artifact of missing subjects. At the relevant stage, subjects are frequently omitted. If they are present, however, Bloom (1991) claims that negation tends to appear in sentence internal position (e.g. *Kathryn no shoe;* but see Déprez and Pierce (1993) for counter evidence).

Stromswold and Zimmerman (2000) present a context analysis that reveals that most of the putative instances of external sentential negation are compatible with an analysis as anaphoric negation in which the sentence initial negator has scope over the preceding rather than the following sentence. The following example (adapted from Stromswold and Zimmermann 2000) illustrates the difficulty (without an indication of a specific context) of assigning an anaphoric (A) or a non-anaphoric reading (B) to negation in early child speech.

(5) Andreas (2;1)

Ann: *Thorsten holt einen, bleib du hier*. ('Thorsten went to get one, you stay here')

And/A: *nee, ich guck*. (no I watch; 'No, I don't want to stay here, I'll (come and) watch')

And/B: *nee ich guck*. (no I watch; 'I don't watch')

Given these ambiguities, Van Valin (1991) proposes to study the acquisition of negation in SOV languages. In such languages, sentence external negation, if present, would be expected in a sentence final position whereas anaphoric negation would be placed in sentence initial position. Van Valin cites examples of sentence external negation from Turkish.

(6) Turkish (Aksu-Koç and Slobin 1985)

Yap-ıcağ-ım ıth (*do*-FUT-1sg NEG; 'I won't do it.') where the adult form would be

Yap-mı-yacağ-im (*do*-NEG-FUT-1sg)

It is hard to judge from the available evidence, however, if these examples are isolated occurrences or reflect a more systematic pattern of use.

Drozd (1995) studies occurrences of pre-sentential negation in English that a context analysis identifies as clearly non-anaphoric and comes to the conclusion that in most cases, these do not express ordinary denials. Building on a hypothesis by Horn (1989: 462) he assumes that negation in these cases is metalinguistic (as opposed to truth-functional) because children use it in order to object to a previous utterance. The meaning of these uses could thus be glossed as *Don't say X (to me)*. An utterance like the one in (7) below would thus not mean 'It is not true that Nathaniel is a king', but rather 'I object to your saying *Nathaniel's a king*'" (Drozd 1995: 588).

(7) *No Nathaniel a king*

Additional evidence for the metalinguistic function comes from the observation that, out of the three early negative meanings distinguished in Section 2.1 (i.e. rejection, nonexistence, and denial) only rejection and denial occur with pre-sentential negation. Nonexistence statements like *No there's a pony* do not occur and would indeed not be compatible with a metalinguistic reading of the type explained above (Drozd 1995: 589). It is also shown that most utterances with pre-sentential negation occur in contexts in which children are echoing utterances of their adult interlocutors as in (8) below.

(8) Mother: *That's a cake. We're going to have it for dinner.*
Peter (2;3): *No that's a cake*. (= 'No way that's a cake!')

Based on his finding that the vast majority of pre-sentential negations with *no* are echoic and consistent with an exclamatory paraphrase like *no way*, Drozd concludes that there is indeed no general stage of external sentence negation for the negator *no*. Instead, the occurrences in question are instances of 'metalinguistic exclamatory sentence negation'.[9]

This is particularly interesting because it speaks to the issues of continuity between the so-called pre-logical functions of negation (rejection and nonexistence) on the one hand and truth-functional denial on the other that was raised in Section 2.1. Considering the developmental gap between these two (but not restricting this claim to negation in a particular position) Hummer et al. (1993) had proposed like Horn (1989) and Drozd (1995) that what looks like truth-functional denial might actually often have a metalinguistic meaning expressing that some preceding statement has an unwarranted content or form rather than that it is false.

Taken together it seems as if the role that sentence external negation plays in L1 development varies cross-linguistically and probably also inter-individually. Furthermore it is possible that its frequency has been over estimated because of the difficulty of distinguishing it from anaphoric negation. Where it occurs it often involves a different negator and it might also differ in function from sentence internal negation in that it is more metalinguistic. Concerning the latter point, however, it is doubtful that all of children's early sentence internal negations are of the truth-functional kind. They might in fact also express the rejection of an earlier statement on grounds of disagreement with any of its properties rather than only falsity.

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[9] Utterances with initial *not* were less often echoic and compatible with exclamatory paraphrases. This is another argument against the claim (Klima and Bellugi 1966) that *no* and *not* are used in free variation.

Sentence internal negation would then differ from sentence external negation in that it is less echoic, but not necessarily in that it is less metalinguistic.

Wherever sentence external negation occurs, the different reasons that have been put forward (see above) in addition to assigning it a different function certainly go a long way in explaining it. But those accounts that are based on the assumption that children producing sentence external negation are actually using surface position in order to signal the sentence negator's wide scope (Slobin 1985; Van Valin 1991) must then also explain on which grounds children give this system up and acquire the target language's internal position for sentence negation. Van Valin (1991: 26) assumes that this developmental shift towards sentence internal negation occurs when children break up their holophrastic representation of a clause into a nucleus and a periphery and understand that it is the nucleus that is the reference point for operators like negation. A related way of saying this is that these early holophrastic units are assigned an internal information structure, whereupon negation tends to be placed between the topic and the comment of such utterances (Jordens and Dimroth 2006).

Once children consistently use sentence internal negation this still does not mean that they always put the negator in an adult-like position. Table 4 (above) illustrates that at Stage III, children produce pre-verbal as well as post-verbal internal negation.

2.2.2.2. What causes the variable word orders at Stage III?

Let us first consider the variability between *nicht*-V and V-*nicht* observed in German. It was noticed from early on (Wode 1976) that verbs in the *nicht*-V pattern mainly occurred in non-finite form (infinitives, participles) whereas verbs in the V-*nicht* pattern were mainly finite. This pattern mirrors the distribution of finite and non-finite verbs in the input. German declarative main clauses have two positions for verbs: whereas non-finite forms occur in sentence final position, finite verbs raise to the second position (V2), i.e. to the left of the negator that is typically placed in a pre-non-finite position (9a). If there is only one (finite) main verb, it is raised to V2 and the negator stays behind. In these cases its surface position can be sentence-final (9b).

(9) a. *Paul hat nicht gelacht*. (Paul has-3SG not laughed; 'Paul didn't laugh.')
b. *Paul lacht nicht.* (Paul laugh-3SG not; 'Paul doesn't laugh')

Clahsen (1988) analysed occurrences of the type V-*nicht* as resulting from a morphological procedure in which children interpret the negator as a kind

of affix to the finite verb. This would however imply that there is a stage at which no other constituents can intervene between the finite verb and the negator, which other researchers (e.g. Weissenborn et al. 1989) question on the basis of examples like the following.

(10) Simone (2;1): *das macht der maxe nicht* (this does Max not; ‚Max doesn‘t do this‘)

A finiteness-related distribution was not only linked to a bias in the adult input but also to children’s own grammatical representations that reflect a strong dependency between verb raising and morphological finiteness (V-*nicht* with finite verb forms and *nicht*-V with non-finite verb forms). This distribution is either assumed to be the consequence of an UG constrained dependency that only young children have access to (e.g. Meisel 1997) or it is seen as the end point of an acquisition process in which finite nonthematic verbs like the copula or auxiliaries, play an important role (e.g. Jordens and Dimroth 2006).

In languages like Dutch, English, and German, such finite nonthematic verbs have been analysed as lexically empty carriers of assertion (Klein 2006). The copula and auxiliary verbs are the first unambiguous assertion markers attested in child language (Jordens and Dimroth 2006), but, importantly, they are acquired later than negation. Before the acquisition of finite nonthematic verbs, children can make (positive) assertions but they do not mark this with the target language’s grammatical means. The positive counter-part of 11a (from Table 4) would thus be 11b (with a thematic verb that is not marked for finiteness).

(11) a. *Kathryn not go over there*
b. *Kathryn go over there*

When auxiliaries first appear in child language they are always used in a finite form and in a finite position (thus preceding negation). This gives rise to the target English word order (*I don’t go sleep*) and a similar word order with German or Dutch auxiliaries. In these languages, however, negation with thematic verbs does not necessitate the insertion of an auxiliary. Finite thematic verbs raise to the V2 position and leave negation behind. Before this regularity is acquired, negation follows nonthematic verbs, but precedes or follows thematic verbs. The variation attested at Stage III (see Table 4) is then the result of early, probably root-learned occurrences reflecting the distribution of patterns in the input that children partly repro-

duce before morphological finiteness marking becomes productive (Wode 1976: 94, Jordens 2002).

Importantly, this variation is not due to problems with the placement of negation but rather reflects different stages in children's acquisition of finiteness. Development goes from pre-verbal negation in non-finite utterances to post-verbal negation with nonthematic verbs, and, in languages where this is grammatical, post-verbal negation with finite thematic verbs.

2.2.2.3. Further development

When children have finally mastered the target position for sentential negation there is still more to learn. As pointed out in the introduction to this section, sentence negation does not only reverse the truth value of the sentence containing it, its position is often also used to indicate where the current sentence differs from its true counterpart (i.e. scope marking). Whereas in many languages, there are default positions for negation that are compatible with wide and narrow scope readings (scope must then be signaled by additional means, for instance intonation), there are also positions dedicated to the expression of narrow scope.

Production studies on the acquisition of narrow scope marking are scarce, however. What has been studied more intensively is children's interpretation of relative scope in sentences containing negation and another quantifier. In such cases, both operators can typically be interpreted in their linear order (in which case the first operator has scope over the second) or vice versa (so-called scope reversal). Musolino, Crain, and Thornton (2000) and Lidz and Musolino (2002) showed that children have a clear preference for translating surface order into scope relations when interpreting sentences like (12).

(12) *Every duck didn't cross the river*

Following their preference for linear interpretation children thus take (12) to mean that for every duck it is true that it did not cross the river, whereas adults prefer a scope reversal interpretation in these cases (= Not every duck crossed the river).

English sentences like (12) do not seem to be very natural.[10] This is different from a phenomenon in Dutch and German, where indefinite NPs are regularly 'scrambled' over negation. When trying to understand these con-

[10] Gennari and MacDonald 2006 found that children are biased by the existence of more natural adult-language realizations.

structions, children do not rely on the surface order but seem to prefer a non-adult-like inverse scope interpretation (Krämer 1998).

(13) a. *De jongen heeft een vis niet gevangen.* (the boy has a fish not caught)
b. *De jongen heeft geen vis gevangen* (the boy has no fish caught)

Krämer (1998) finds that children between 4 and 7 do not make a difference between (13a) and (13b). When presented with a picture story in which a boy catches all but one fish both sentences are rejected as incorrect descriptions, whereas adults correctly accept (13a). Unsworth et al. (to appear) show however that children can be pushed by the context to accept (13a). When it is made clear that it is the boy's task to catch all the fish and children are then explicitly asked if he really did, they readily accept (13a) as a true description. Unsworth et al. (to appear) therefore conclude that children must have access to the adult-like readings as well.

3. Developmental patterns in l2

The acquisition of negation is one of the best studied domains in untutored L2 acquisition by older children and adult learners. Investigations of negation at different stages of L2 development have concentrated on Dutch, English, French, German, Italian, and Swedish as target languages (see Table 1). Starting from the assumption that L2 learners are already competent speakers of their L1, no special attention has been devoted to the emergence of negative functions like rejection and disappearance that were attested early children's speech. Instead, the focus has been on denials and the acquisition of the relevant formal means for their expression on the sentence level.

Evidence on the L2 acquisition of negation has often not been gathered in its own right, but rather in order to test hypotheses concerning the relation between the acquisition of finite verbal morphology and finite syntax. In many of the target languages finite verbs raise over negation to a position higher up in the syntactic structure of the relevant sentences. Negative sentences are thus a classic means to investigate the position of verbs in learner language, which is often ambiguous in simple utterances, in particular if L2 learners start out with an SVO word order (cf. Haberzettl 2005).

The findings reported in the subsequent sections are mainly concerned with the acquisition of different lexical items for the expression of negation and their integration in the developing sentential structures, partly as a function of wide vs. narrow scope in different information structures. The influence of the structure of negation in the learners' L1 (transfer) cannot be sys-

tematically treated here for reasons of space. In particular in the early stages of L2 acquisition patterns from L1 seem to be less influential than language internal principles for the development of utterance structure (Perdue 1993; Stauble 1984). The focus is on a comparison to the relevant findings from L1 acquisition. Similarities are summarized in 3.1, differences in 3.2.

3.1. Where L1 acquisition resembles L1 acquisition

For the L2 acquisition of languages with post-verbal (rather: post-finite) negation there is converging evidence for orders of acquisition that are similar to those observed in child language (see Section 2.2.2). The developmental patterns summarized in Table 5 below have been found in the ESF project (Perdue 1993), a longitudinal and cross-linguistic study on L2 acquisition by untutored adult learners. The orders of acquisition for sentence negation in English (Giuliano 2003; Silberstein 2001), French (Giuliano 2003; Véronique 2005), and German (Becker 2005; Dietrich and Grommes 1998) are largely confirmed by other studies (e.g. Cancino et al. 1978; Clahsen et al. 1983; Meisel 1997), and also for other target languages with post-finite negation (e.g. Swedish, see Hyltenstam 1977).

Table 5. Four major steps in the L2 acquisition of sentence negation in English, French, and German

Phase	Structure	English	French	German
I	Neg-X	for me no very concentration	[nepade eprimeri][11] ((this is) no print shop)	nix andere kind (no other child)
II	Neg-V	I prove two time but no speak English	pas [parlar] français (not speak French)	ich nix komme (I not come)
III	$V_{nonthem.}$ -Neg	I don't see very well	là bas [ne pe pa sortir] (over there neg can not leave; '[the speaker's husband] was not allowed to leave the place (= Chile)')	ich kann nicht verkauf (I can not sell)
IV	V-Neg	—	la personne [ne travaj pa] (the person neg work not; 'the person doesn't work')	er arbeitet nicht gut (he works not well; 'he doesn't work well')

[11] Target deviant learner realizations are transcribed in square brackets. See Perdue (1993) for details

According to Perdue et al. (2002), Stage I reflects a nominal utterance organisation. At this stage negation can directly precede all sorts of (mainly nominal) lexical items. From Stage II onwards, verbs and their argument structure play an important role for utterance organisation (this stage corresponds to the 'Basic Variety'; Klein and Perdue 1997). In learners of English, French, and German, negation precedes the VP. Importantly, at this stage verbs are not yet productively marked for finiteness. Stage III corresponds to the first step in the development of a finite utterance organisation, in which non-thematic verbs (copula, auxiliaries, modal verbs) are the first verbal items productively used in finite forms and positions. In the target languages presented in Table 5 these items appear to the left of the negator in surface structure without exception. Syntactic and semantic reasons for this special behavior of non-thematic verbs have been put forward (see Becker 2005, Giuliano 2003, Jordens and Dimroth 2006, Parodi 2000). The gist of these approaches is that the category of finiteness is easier to grasp for L2 learners when it is carried by non-thematic verbs that do not have much lexical content.

At Stage IV learners have understood how to mark utterances with thematic verbs for finiteness in cases where no such independent carrier of finiteness is present. In French and German this means that from Stage IV onwards, negation occurs to the right of thematic verbs as illustrated by the examples in Table 5. As Becker (2005: 29) points out, however, the acquisition of finite verb morphology is a long process and some variation in the form and position of finite verbs is to be expected.

Overall it can be concluded that the way in which negation is integrated depends on the structure of the underlying utterances – in particular on non-finite as opposed to finite utterance organisation. In 2.2.2 we saw a similar tendency in the development of negation in L1 acquisition. We can conclude that in L2 as well as L1 acquisition, the expression of negation precedes the grammatical marking of assertion through finiteness; see Klein 2006).

Concerning the later acquisition of finiteness, it is relatively undisputed that non-thematic verbs are the first verbs used productively in finite form and position (i.e. to the left of negation in verb raising languages). There is, however, an ongoing debate concerning the relation between morphological and syntactic features of the finiteness of thematic verbs in L1 vs. L2 acquisition. The claim is that there is a direct relation between morphological finiteness and verb raising only in L1 acquisition whereas there is more variability in L2 acquisition, i.e. both finite and nonfinite verbs can show up to both sides of negation (Meisel 1997). Verhagen and Schimke (2009)

assemble the available evidence for L1 and L2 acquisition of French and German and demonstrate that there is a certain degree of variability in both L2 and L1 data, so that the differences between both types of acquisition in this domain are probably smaller than previously assumed.

3.2. Where L2 acquisition differs from L1 acquisition

Careful analyses of data from the first phases of L2 acquisition (e.g. Becker 2005; Bernini 2000; Silberstein 2001) reveal that L2 learners differ from L1 learners in the communicative potential of even their earliest productions of negative utterances. Whereas communicative needs and communicative means develop largely on a par in L1 acquisition (cf. the stepwise acquisition of negative meanings discussed in Section 2.1), this is clearly not the case for L2 acquisition. There is no need for L2 learners to go through the process of acquisition of negative functions a second time.

Utterances produced by older children or adults learning an L2 are more complex from early on. Whereas it has been proposed for L1 acquisition that young children tend to start from a holistic representation for what is negated (Jordens 2002, Van Valin 1991), it is less clear that there is such a stage in L2 acquisition. Studies relying on detailed contextual analyses of beginning L2 speech (Andorno 2008, Perdue 1996) found that early L2 utterances have an internally partitioned structure that learners can exploit for the expression of negation. From the ‚Neg-X' Stage onwards (Table 5) learners can put elements that do not belong to the scope of negation into sentence initial (topic) position (Becker 2005, Silberstein 2001). As illustrated in (14) for L2 English, such topics can be relatively complex (‚+' indicates a short break).[12]

(14) a. *in london + no very sun*
b. *me + for holiday + no september*

Beginning L2 learners not only mark that topical elements do not belong to the scope of negation, they also block scope extension to the right of the negator by stressing the affected element and de-stressing the following part of the utterance (stress indicated through capitals).

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[12] All L2 examples in this Section are from the ESF database hosted at the Max-Planck-Institute for Psycholinguistics in Nijmegen; (14) – (16) are from the learner Santo (L1 Italian, L2 English), (17) is from Angelina (L1 Italian, L2 German).

(15) M: *so you're a very good cook then*
S: *no VERY good*

Another important device for the marking of information structure that occurs in the beginning phases of L2 acquisition is the use of so-called I-Topics. Utterances with I-Topics have a special intonation contour and evoke a contrastive reading (Büring 1995) that can be used by learners in order to express that some topical constituent is *within* the scope of negation, in contrast to another (implicit or explicit) topic.

(16) Interviewer: *do you have your driving license?*
Learner: *original copy no* [Silberstein 2001]

(17) Learner: *mein mann (h)aber de auto, ich nix* (my husband have the car, I not) [Becker 2005]

The main differences between older L2 learners and young children acquiring negation in their L1 lies in the availability of the functions of negation at the outset of acquisition. Even though the formal repertoire at the beginning of the acquisition process is equally restricted in L1 and L2 acquisition, clever usage of the different utterance patterns and their information structure in context allows L2 learners to express negation with different scope properties even before they have acquired the relevant target language means.

4. Conclusion

The acquisition of negation has been studied intensively in both L1 and L2 development. Wherever researchers have undertaken direct comparisons of both types of acquisition processes, they have come to very different conclusions with respect to overall similarities and differences. Cook (1993: 43), for example, raises the issue of "the specific developmental structures 'Neg + X' and 'Subject Neg VP', which universally occur in studies of L1 acquisition across languages as diverse as Latvian and Hungarian, and in studies of L2 acquisition of English and German as well as in pidgin and Creole languages". He wonders why it is that learners produce such structures in the absence of models in the input and comes to the conclusion that "There is evidence for a common grammar at particular stages of language development, more or less regardless of L1 or L2." (Cook 1993: 43; see e.g. Jordens 1987 for a similar claim). Meisel (1997: 228), on the other hand, points out that L2 learners, as opposed to L1 learners "do not refer to the [± finite] distinction when acquiring the placement of the negative ele-

ment" and consequently views "…first and second language acquisition as fundamentally different in nature."

Clearly, however, these claims apply to different phases in development. Cook's (1993) statement of similarity refers to the use of negation before the acquisition of assertion marking through finiteness. Meisel (1997) investigates the behavior of negation during the acquisition of finiteness and finds that children are more consistent than adult L2 learners in raising verbs with finite inflections over negation and leaving non-finite verbs in an unraised position within VP. Far-reaching claims are based on these observations. Meisel assumes that due to maturational constraints only children have access to procedures of language acquisition that conform to UG (e.g. concerning the relation between feature strength and verb raising) whereas adults have to rely on domain-general problem solving faculties instead (see also Bley-Vroman 1990). There is, however, an ongoing debate concerning adult L2 learners' access to UG (e.g. Prévost and White 2000) and concerning the empirical evidence underlying claims about the placement of verbs relative to negation in L1 and L2 (Verhagen and Schimke 2009). Some researchers therefore assume that similarities in utterance structure outweigh differences also at these later stages (e.g. Dimroth et al. 2003).

What we can maintain at this point is that both L1 and L2 learners explicitly express negation before they acquire finiteness as the target language's grammatical means of assertion marking. While, at this time, L1 learners are still struggling with the acquisition of negative meanings and with the reanalysis of putatively holistic representations of the information to be negated, L2 learners can exploit the communicative potential of relatively simple structures more successfully.

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