

Intonational Means to Mark Verum Focus in German and French

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Abstract

German and French differ in a number of aspects. Regarding the prosody-pragmatics interface, German is said to have a direct focus-to-accent mapping, which is largely absent in French – owing to strong structural constraints. We used a semi-spontaneous dialogue setting to investigate the intonational marking of Verum Focus, a focus on the polarity of an utterance in the two languages (e.g. *the child IS tearing the banknote* as an opposite claim to *the child is not tearing the banknote*). When Verum Focus applies to auxiliaries, pragmatic aspects (i.e. highlighting the contrast) directly compete with structural constraints (e.g. avoiding an accent on phonologically weak elements such as monosyllabic function words). Intonational analyses showed that auxiliaries were predominantly accented in German, as expected. Interestingly, we found a high number of (as yet undocumented) focal accents on phrase-initial auxiliaries in French Verum Focus contexts. When French accent patterns were equally distributed across information structural contexts, relative prominence (in terms of peak height) between initial and final accents was shifted towards initial accents in Verum Focus compared to non-Verum Focus contexts. Our data hence suggest that French also may mark Verum Focus by focal accents but that this tendency is partly overridden by strong structural constraints.

Keywords

Verum Focus, function word, German, French, intonation

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Introduction

Consider the assertion in Figure 1 spoken by someone who is describing a situation illustrated in a picture: The intonation realization shown in Figure 1 may implicate that someone else has earlier claimed exactly the opposite, that is (*In my picture*) *the child is not tearing the banknote*¹ (e.g. Braun & Tagliapietra, 2010; Jackendoff, 1972). This example represents a case of focus on the polarity, which is commonly referred to as *Verum Focus* in the semantic literature² (e.g. Höhle, 1992; Klein, 2006; Romero & Han, 2004). In the current study, we investigate the intonational marking of *Verum Focus* in semi-spontaneous mini-dialogues across two typologically distinct languages, German and French.

There have been a number of intonation studies on the realization of contrastive focus; however, these have mostly been concerned with the intonational realization of content words, which primarily occur in referential expressions (e.g. *the LADY is tearing the banknote* as opposite to *the child is tearing the banknote*, cf. Baumann & Grice, 2006 for German; Jun & Fougeron, 2000 for French). Here we investigate the realization of a focus on the polarity of an utterance; a case where it is not directly obvious to what extent focus can be formally associated with a specific word of the utterance (cf. Gussenhoven, 1983). In cases with a polarity or *Verum Focus*, the pragmatic focus rests on the finite verb. It is no surprise, therefore, that *Verum Focus* is claimed to be realized with a pitch accent on the finite verb (i.e. the auxiliary *is* in Figure 1), see Höhle (1992). Uniformly, the German linguistics literature claims that a *finite* verb (which is morphologically inflected and in agreement with the subject) asserts a fact about the topic (i.e. *the child*) and the comment (i.e. *tearing the banknote* of the utterance).³ A contrastively accented finite verb *validates* this assertion if previously negated or questioned (as in Figure 1, cf. Klein, 1998, 2006). While this type of focus can in principle be encoded by a number of linguistic means (e.g. fronting operations and/or particles like the German *doch* and the French *si*, for details, see for instance Dimroth, Andorno, Benazzo, & Verhagen, 2010; Leonetti & Escandell-Vidal, 2009), here we pay attention to its intonational realization.

In Experiment 1 we will test how *Verum Focus* is marked in German. From previous work (e.g. Baumann, Grice, & Steindamm, 2006), we hypothesize that in *Verum Focus* contexts the finite verb⁴ receives a pitch accent, as illustrated in Figure 2. Specifically, Experiment 1 aims at providing more systematic evidence on the phonological description of *Verum Focus* in terms of accent placement and accent types. This will result in a more complete understanding of how *Verum Focus* is represented as an intonational phenomenon in German.

The definition of *Verum Focus* as an intonational phenomenon seems to be very Germanic-rooted (cf. Höhle, 1992; Klein, 1998, 2006). Therefore, it is particularly worthwhile to study the prosodic realization of *Verum Focus* in French, a language in which the tonal patterns are strongly governed by structural constraints. In brief, the lowest prosodic unit is the accentual phrase (AP),⁵ which is the domain of the final accent. The final accent is obligatorily placed on the last full syllable of the content word (i.e. H2 on *-ré* in Figure 3). French accentual phrases optionally contain an initial accent, which is typically realized on one of the first syllables of an AP-initial content

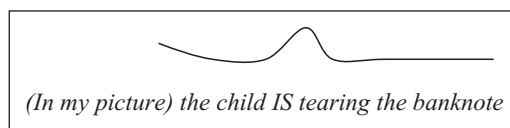


Figure 1. Illustration of a contrastive intonation contour realized on the finite and lexically empty verb *IS*.



Figure 2. Schematic representation of a falling nuclear accent realized in a German Verum Focus utterance (“In my picture the child IS tearing the banknote”).

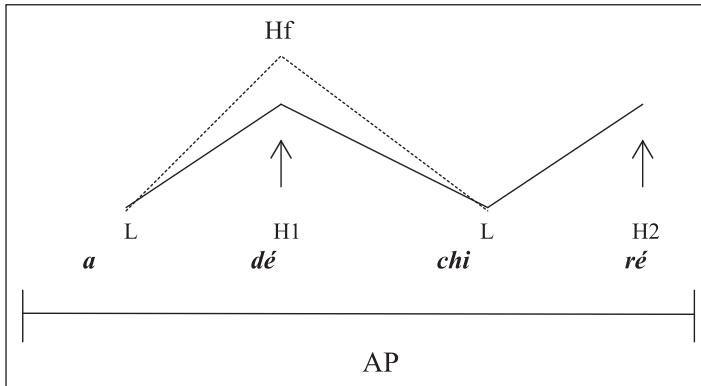


Figure 3. Schematic representation of an LHLH accentual pattern realized within the AP *la déchiré* (“has torn”). As indicated by the arrows, the final accent (H2) is realized on the last syllable of the content word (*ré*) and the initial accent (H1) on its first syllable (*dé*). In this example, the focal accent (Hf) is realized on the H1 (dotted line).

word (H1 on *dé-* in Figure 3). It is important to note that the initial accent is only rarely associated with AP-initial monosyllabic function words (cf. Jun & Fougeron, 2000, 2002). In narrow focus conditions, both the initial accent and the final accent can attract a so-called *focal* accent (Hf). In Figure 3, the dotted line shows an example of a focal accent on the initial accent.

Naturally, a strong effect of structural constraints on intonational realization may partly or totally rule out the use of intonational means to mark Verum Focus in French (e.g. an “accented” finite verb followed by “deaccented” *given* words as in German). It is not clear from the literature whether and how French speakers intonationally mark Verum Focus. In Experiment 2 we therefore tested French participants on the same materials as German participants to investigate whether or not pragmatic factors like Verum Focus license the presence of a focal accent on the phonologically weak, but functionally strong (cf. Klein, 1998, 2006) monosyllabic auxiliary (i.e. *a* “has” in Figure 3). The cross-linguistic comparison between German and French will inform us whether the functional importance attributed to finite verbal elements in German (cf. Bernini, 2009; Dimroth et al., 2010; Klein, 1998, 2006) also holds for French.

In what follows, we will conclude this introductory section by a more detailed definition of Verum Focus. Section 2 then presents a general overview of the phonology and intonational marking of focus in German before we describe the empirical study on the realization of Verum Focus in German in Section 3 (Experiment 1). In Section 4, previous studies on the phonology of French are reviewed, with particular attention to focus marking, followed by the description of Experiment 2 in Section 5. Finally, we will turn to the conclusions based on the main findings and the general implications of Verum Focus in both languages in Section 6.

1.1 Verum Focus on auxiliaries (finite and lexically empty verbs)

The phenomenon of Verum Focus is by all means at variance with our common understanding of focus as “highlighting” the “most important” “new” information of the utterance. If we go back to Figure 1 and consider its context utterance: *the child is not tearing the banknote*, the lexical items are identical in both assertions (and, therefore, information structurally *given* for the example shown in Figure 1), except for the polarity. In other words, Verum Focus represents a case where *nothing is new* to the speaker, except for the information that a relevant state of affairs indeed holds for a certain topic entity (i.e. the state of affairs *tearing the banknote* holds for the entity *the child*). Thus, a better way to account for this phenomenon is to analyze it in terms of *alternative sets* (cf. Jackendoff, 1972; Krifka, 2007; Rooth, 1992; Steedman, 2000; von Stechow, 1989). In Rooth’s framework (1992), for instance, the focus semantic value, which is added to the ordinary semantic interpretation of an utterance, is represented by a set of alternatives. In our specific case, the ordinary semantic meaning is, for instance, the proposition *the child is tearing the banknote*; whereas the focus semantic value is the set of alternatives that contrasts with the assertion in Figure 1, which is here represented by the whole utterance containing the inverse (negative) polarity, i.e. *the child is not tearing the banknote*. As a starting point for our investigation, we treat Verum Focus as a type of *narrow focus* that affects the polarity component of the utterance, while the rest of the utterance is considered to represent *background/given* information.

Unlike content words, which form prosodic words (ω) and hence constitute the domain of word stress (e.g. Nespor & Vogel, 2007), auxiliaries and most other function words are frequently unaccented and integrated into the prosodic structure at the phrase level (ϕ) as prosodic clitics, i.e. as “free” clitic (Fnc (Lex) $_{\omega}$) $_{\phi}$, as “internal” clitic ((Fnc Lex) $_{\omega}$) $_{\phi}$ or as “affixal” clitic ((Fnc (Lex) $_{\omega}$) $_{\phi}$). When narrowly focused, however, function words can change their prosodic status (Selkirk, 1995). In German, as reported in various articles (e.g. Féry, 2011; Höhle, 1992; Lohnstein & Stommel, 2009), monosyllabic auxiliaries can have a nuclear pitch accent and thus be promoted to a prosodic word (ω -promotion). To the best of our knowledge, there is no experimental evidence regarding ω -promotion of function words in French. We therefore investigated whether in Verum Focus contexts, monosyllabic auxiliaries can be realized with a focal accent. Results of our study will therefore also have implications for French intonational phonology.





2 Background on German intonational phonology

2.1 Pitch accent types

We refer here to the most recent autosegmental-metrical description of German, GToBI (*German Tones and Break Indices*) (see Grice, Baumann, & Benz Müller, 2005). Nonetheless, when discussing focus marking (cf. section 2.2), we also include other autosegmental-metrical approaches (such as Féry, 1993; Grabe, 1998; Wunderlich, 1991).

According to GToBI, there are two levels of phrasing: the intermediate phrase (ip), corresponding to a tone unit and demarcated by phrase accents (L- and H-), and the intonation phrase (IP), corresponding to a major tone group (Ladd, 2008) and demarcated by boundary tones (L% and H%). Each IP contains at least one ip; each ip at least one pitch accent. GToBI distinguishes six types of pitch accents: H*, H+L*, H+!H*, L+H*, L*+H, and L*. In Table 1, we illustrated their F0-contours when followed by an L-phrase accent. Furthermore, H-tones can be *upstepped* (i.e. realized with higher pitch than preceding H-tones in the same intermediate phrase, ^H) or *downstepped* (i.e. realized with a lower pitch than preceding H-tones in the same intermediate phrase, !H).

Table 1. Schematic contours of the six accent types according to GToBI (adapted from Grice et al., 2005). The thick black line indicates the stressed syllable, with which the starred tone is associated, the thinner black line indicates the anchor for the phrase accent (L-). Some of these accent types can be also combined with the H- phrase accent.

Accent types	Schematic contours
H* L-	
H+L* L-	
H+!H* L-	
L+H* L-	
L*+H L-	
L* L-	

Following Benzmüller and Grice (1998) as well as Grice and Baumann (2007), the “nuclear” syllable is the last pitch accent in an intermediate phrase and is usually perceived as the most prominent syllable of the phrase. In nuclear position, the full range of pitch accents is possible; each of them contributes a specific communicative function (for details, see Grice et al., 2005). Prenuclear accents, on the other hand, tend to be mainly realized with rising accents, such as H*, L+H*, L*+H, and more rarely as L* (e.g. Braun, 2006; Mehlhorn, 2001).

Phrase accents determine the contour from the last pitch accent until the end of the intonation phrase; GToBI mainly distinguishes two types: L- and H-. They have been shown to have a secondary association with a metrically strong syllable following the nucleus (Grice, Ladd, & Arvaniti, 2000). Intonation phrases can end with one of four kinds of boundary tones: L-%; L-H%; H-% and H-^H%.

2.2 Focus marking

In broad focus contexts, German places the nuclear accent on the internal argument of the intonation phrase, unless it is pronominalized or contextually given (e.g. Féry & Samek-Lodovici, 2006; Truckenbrodt, 2007; Uhmman, 1991).

In German, different tonal realizations are used to convey distinct information about structural meanings. Researchers generally agree upon the fact that downstepped pitch accents are more frequently used in marking the nuclear in broad focus than in narrow focus contexts. For instance, in a reading task conducted by Baumann et al. (2006), the authors found that in broader foci (cued by context questions like *What's new?* and *What about Manuela?*), German speakers produced more *downstepped* nuclear accents (!H*) than in narrow and corrective foci (cued by questions like *What does Manuela want to paint?* and *Manuela wants to paint faces?*). Instead, narrow and corrective foci were typically marked by accents with a *medial* peak (i.e. H* or L+H*), by unaccented post-focal elements and optionally preceded by prenuclear accents with lowered peak heights (e.g. Baumann et al., 2006; Féry & Kügler, 2008).

Pitch accents also correlate with the degree of givenness of referents and their activation state (i.e. given/active referent, accessible/semi-active referent, new/inactive referent). The medial peak accent (H*) is typically used for marking new information (i.e. when a referent gets active from a previous inactive status), while the early peak accents (i.e. H+L* and H+!H*) are used more to mark accessible information (i.e. when a referent gets active from a previous semi-active status). Given information (i.e. when a referent is already “active” in the listener’s mind), on the other

hand, is typically deaccented (e.g. Baumann & Grice, 2006; Baumann & Hadelich, 2003; Kohler, 1991).

Apart from such categorical differences, certain information structure distinctions are signaled by gradient, phonetic means. More specifically, when speakers use identical pitch accents for narrow and broad foci, pitch accents in narrow focus are realized with higher and later peaks and with a greater pitch excursion than phonologically identical accents in broad focus contexts (e.g. Baumann et al., 2006; Féry & Kügler, 2008).

Another way to intonationally encode a contrast in German is by producing the so-called “hat pattern” or “bridge accent” (Büring, 1997; Mehlhorn, 2001; Wunderlich, 1991). The hat pattern in German has been associated with double contrast sentences, containing both a contrastive topic and a contrastive focus (Büring, 1997; Mehlhorn, 2001). However, they appear to be more frequent in sentences involving quantifiers and accented adjectives than in syntactically neutral utterances (Braun, 2006). The hat pattern is generally described as a contour with a rising accent on the contrastive topic, a sustained high pitch, and a falling accent on the contrastive focus (Braun, 2006; Mehlhorn, 2001). In the German phonological literature, however, there is some disagreement on the accent types involved in this contour (e.g. Féry, 1993; Krifka, 1998; Wunderlich, 1991).

In sum, there are still some open issues regarding the intonational means to mark focus – and particularly Verum Focus – in German that this study addresses by analyzing productions in a semi-spontaneous dialogue setting.

3 The study: experiment I

3.1 Methods

A picture-difference task between two speakers was designed for the controlled elicitation of Verum Focus (henceforth VF) utterances in a dialogue-game. For a more detailed description of this protocol see *The polarity-switch dialogue* (Turco, 2009). This task elicits picture comparisons in the form of a dialogue between a confederate speaker and the participant.

The structure of the dialogue-game for the elicitation of VF is based on a three-step schema: (a) a *baseline* picture, accessible to both speakers, in which a situation is illustrated (e.g. *a child tearing a banknote*); (b) a *negation* picture, in which the opposite event is depicted (e.g. *the child is not tearing the banknote*), only accessible to the confederate; (c) an *affirmation* picture that is similar to the baseline picture (e.g. *the child is tearing the banknote*), only accessible to the participant. By providing context negation utterances (confederate: *In my picture X is not doing Y*), the task allowed us to elicit target utterances with the same word order but with a change on the polarity of the proposition (participant: *In my picture X is doing Y*).

Depending on the nature of the pictures (baseline, confederate picture and participant picture), other kinds of foci can be spontaneously elicited as well (e.g. narrow focus on different constituents, broad focus).

3.1.1 Participants. Eight German native speakers (two male and six female, average age = 23.3, $SD = 5.9$) were recorded. All were students at the University of Heidelberg and had been living in Heidelberg at the time of the recording. They originated from different parts of Germany but they all spoke Standard German. None of them had learned a language other than German before the age of 10. Furthermore, none of them had a reported history of speech/language impairment or other developmental deficits. They all received a small fee for their participation.

3.1.2 Materials. In the present experiment, we compared VF realizations to identical utterances containing a Predicate Focus; that is, a change in the action (henceforth non-Verum Focus, NVF).

An example VF condition is shown in the b-utterance in (1), an example NVF condition in the b-utterance in (2). Following established conventions, the domain of focus is marked by squared brackets with a subscripted F:

- (1) German VF mini-dialogue example between the confederate and the participant prompted by the three pictures:

Baseline picture (child tearing a banknote)

Confederate's picture (the child not tearing the banknote):

a. Auf meinem Bild hat das Mädchen den Geldschein nicht zerrissen

In my-F.SG.DAT picture has the-F.SG.NOM girl the-M.SG.ACC banknote NEG torn

Participant's picture (the child tearing the banknote):

b. Auf meinem Bild [hat]_F das Mädchen den Geldschein zerrissen

In my-F.SG.DAT picture has the-F.SG.NOM girl the-M.SG.ACC banknote torn

- (2) German NVF mini-dialogue example between the confederate and the participant prompted by the three pictures:

Baseline picture (a postman)

Confederate's picture (the postman delivering a package):

a. Auf meinem Bild hat der Postbote ein Packet abgegeben

In my-F.SG.DAT picture has the-M.SG.NOM postman a-N.SG.ACC package delivered

Participant's picture (the postman tearing a newspaper)

b. Auf meinem Bild hat der Postbote [eine Zeitung zerrissen]_F

In my-F.SG.DAT picture has the-M.SG.NOM postman a-F.SG.ACC newspaper torn

There were 32 VF trials, 32 NVF trials, and 50 filler trials. The 32 VF trials consisted of 12 trials, in which pictures depicted completed actions (auxiliary-items) encoded by telic and transitive verbs (e.g. Givón, 2001; Verkuyl, 1972), 12 trials in which pictures illustrated ongoing actions encoded by transitive verbs inflected in simple-present tense (lexical-items), and eight trials in which pictures depicted emotional states encoded by a copula verb (copula-items). Given that the interlocutors had to compare each other's pictures, both VF utterances and NVF utterances contained a further initial contrast on the prepositional phrase (e.g. *In MY picture...*), resulting in a double contrast rather than a simple correction context (Dik, 1981). The fillers consisted of picture-trials with differences in the entities of the utterance (i.e. either the syntactic subject or the object; e.g. confederate: *In my picture the man is drinking a beer* vs. participant: *In my picture the man is drinking a cola*).

In the present investigation we will concentrate on the auxiliary-items.⁶ These items contained a complex verb construction (i.e. auxiliary followed by a non-finite verb) to address the question

of whether speakers would locate the accent on the auxiliary, which is the carrier of the assertion, or not and if so, and if so, which accent types they would produce. The auxiliary was expressed with the monosyllabic *hat* in German (“has”). There were 12 VF auxiliary-items and 12 NVF ones (12 auxiliary-item pictures x 8 subject x 2 contexts (VF and NFV)). In the corresponding pictures, the referent (the subject noun, in our case) was always represented by one repeated entity in all the three pictures of each trial. All stimuli are listed in the Appendix (Table A1). An example triplet of pictures is shown in Figure 4.

A female native speaker of standard Northern German (26 years old) produced the context utterances. She was instructed to keep eye-contact and was trained beforehand on the intonation contours to use so that she could produce the same intonation contour for all participants naturally. In both conditions, she realized the entire utterance in two intermediate phrases. In the VF condition, she produced a prenuclear L^{*+H} accent on the possessive pronoun *meinem* in the prepositional phrase and a nuclear accent ($H^{*} L-$ or $!H^{*} L-$ or $^{\wedge}H^{*} L-$) on the German negation particle *NICHT* (“not”); the remainder of the utterance was unaccented. In the NVF condition, she also produced an L^{*+H} on the possessive pronoun, but the $H^{*} L-$ (or $!H^{*} L-$ or $^{\wedge}H^{*} L-$) nuclear accent was realized on the grammatical object of the utterance; in most of the cases the remainder of the utterance was unaccented.⁷

3.1.3 Procedure. Focus was manipulated as a within-subjects factor. Two lists were created with a pseudo-randomized order of the trials (separating two items with the same condition by at least two other items). Both lists started with a filler trial. Participants were assigned randomly to one of the two lists. They were instructed with a video-clip tutorial in the native language and familiarized with the task in a short warm-up session consisting of four trials. The baseline pictures (cf. section 3.1)

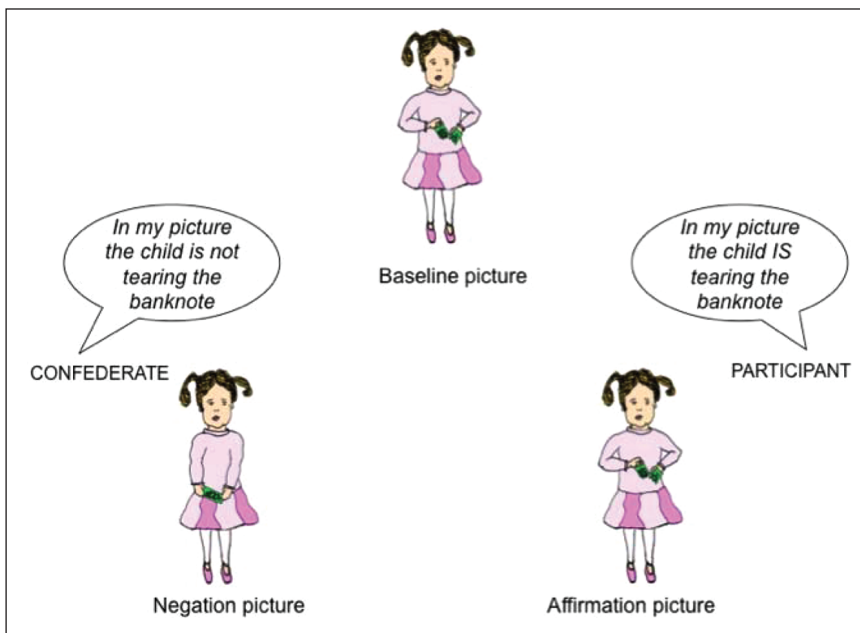


Figure 4. Example of Verum Focus marking protocol. In contrast to the Baseline picture where the child has a torn banknote in her hands, in the Negation picture the banknote is not torn and this cues the confederate to say that she is not performing the action of tearing the banknote. In the Affirmation picture, instead, the child IS tearing the banknote (as already “established” in the Baseline) and this cues the participant to mark Verum Focus (i.e., *IS*). The presence of a Baseline picture justifies and contextualizes the use of the negation utterance by part of the confederate.

were displayed on an IBM screen visible to both interlocutors; the individual pictures on two e-books, one for the confederate and one for the participant. Each picture described a single event and participants were instructed to only produce a single utterance. In the VF condition, the confederate described the negation picture in comparison to the baseline picture. The participant then had to describe the affirmation picture in comparison to the confederate's description of the negation picture. The confederate had the first turn in all the mini-dialogue trials and, by comparing his picture with the baseline, could provide the negation context so as to cue the participant to the production of the VF structures. In the NVF condition the procedure was the same, but the pictures showed two different actions performed by the same agent. The interlocutors could not see each other's pictures and were not pressured by any time constraints. In order to encourage participants to produce full sentences, they were told that their productions would later be used for another experiment, in which somebody else would have to match the corresponding pictures to their descriptions.

All sessions took place in experiment rooms and were sound-recorded using a Roland Edirol R-09 24bit digital wave/MP3 recorder and two Sennheiser ME40 phantom microphones (one for the confederate and one for the participant), which were linked to a six channel audio mixer (Alesis 6FX). The microphones were placed at approximately 30 cm distance from the speakers. For the simultaneous display of the pictures on the three screens, computers were connected via (W)LAN to a 3COM-LAN Switch in a client/server configuration. The productions were directly digitized on a PC with a sampling rate of 44.1kHz (16 Bit). The whole session, comprising of 114 trials, lasted approximately 20 minutes.

3.1.4 Research questions and predictions. We tested how the tonal structure of VF utterances differs in terms of accent placement and accent types with respect to NVF utterances. On the basis of recent studies on German focus-marking we predicted that there is a direct relationship between nuclear accent placement and focus exponent: a nuclear fall is expected on the auxiliary in VF contexts (cf. Dimroth et al., 2010; Höhle, 1992; Klein, 1998, 2006), and on the object noun in NVF contexts (cf. Féry & Samek-Lodovici, 2006; Truckenbrodt, 2007; Uhmman, 1991). As far as accent types are concerned, we hypothesized that the focus exponents (i.e. *hat* in VF and the object noun in NVF) will be predominantly realized with *medial* peak accents (i.e. H* or L+H*, e.g. Baumann et al., 2006). In both conditions the non-finite verb is expected to be unaccented (e.g. Uhmman, 1991). This also holds for the subject noun: in both conditions the referent encoded by the subject noun (e.g. *das Mädchen*, "the girl") represents *given* or *active* information (e.g. Baumann, 2006; Baumann & Grice, 2006) as it is introduced both visually (on screen) and auditorially by the confederate speaker.

Moreover, speakers also need to encode the contrast between the pictures (i.e. *In MY picture...*). Hence, an alternative prediction is that German speakers will produce *hat* patterns in VF cases. This prediction is strengthened by claims that *hat* patterns have been shown to be more frequent in Dutch productions when the two pitch accents are "to be made in close succession" (Levelt, 1989, p. 405). In our materials, the two contrasted words are only separated by one syllable (i.e. *Bild* "picture"), which might increase the likelihood of *hat* pattern realizations. However, no firm predictions are possible since previous reading studies in German do not agree on the occurrence of *hat* patterns in such contexts (Braun, 2006; Mehlhorn, 2001). Thus, we also investigate whether in semi-spontaneous productions *hat* patterns are frequently used in such double contrast conditions and, if so, which phonological form they have.

3.2 Data selection

The 192 productions for German were first coded on the phrase (ip), word and syllable level using the Praat software (Boersma & Weenik, 2009). In order to ensure coherence of the pitch analysis, 38 NVF utterances in which participants produced pauses within phrases, and utterances with hesitations or disfluencies were not included. Furthermore, 11 NVF and 29 VF utterances with different tenses or aspects (e.g. use of the aspectual adverb *gerade* at the moment) and with a verb different from that of the confederate were discarded, as these utterances do not only signal Verum Focus but may also signal a semantic contrast. This left 47 NVF and 67 VF cases for analysis. The utterances were labeled according to GToBI (Grice et al., 2005) by the first author. A random selection of 40% of the data for each condition (both VF and NVF) were also annotated by the third author to compute the Kappa Coefficient of Agreement⁸ (Cohen, 1960), a common measure of interrater reliability. In cases of disagreement we chose the annotation of the first author.

3.3 Results

The interrater reliability score for the labels on the auxiliary *hat* had a Kappa of 0.79 ($SD = 0.07$) for the observed categories H* L-, H+L*, H+!H*, and Unaccented (see Table 1).⁹ For the object noun, Kappa was 0.68 ($SD = 0.09$) for the accentual realizations H* L-, H+L*, and Unaccented (Table 1). Both Kappa values signal a very high level of agreement (Landis & Koch, 1977).

In most of the trials ($n = 47$ in NVF; $n = 59$ in VF), participants produced an intermediate phrase or an intonation phrase between the topic location (i.e. *Auf meinem Bild*) and the assertion (i.e. *hat das Mädchen den Geldschein zerrissen*). In other words, there were only a few VF trials in which the intermediate phrase spanned the entire utterance, including the prenuclear accent realized on the contrastive topic *Auf meinem Bild* (12%, eight times). These cases were realized as hat patterns with a pitch rise (always realized as L*+H) on the possessive pronoun *meinem*, a sustained high pitch (not changing more than 10 Hz) and a pitch fall either on the auxiliary (twice as H+L* and twice as H* L-) or on the object noun (once as H+L* and three times as H* L-). One example of a hat pattern realized as H+L* on the auxiliary is shown in Figure 5.

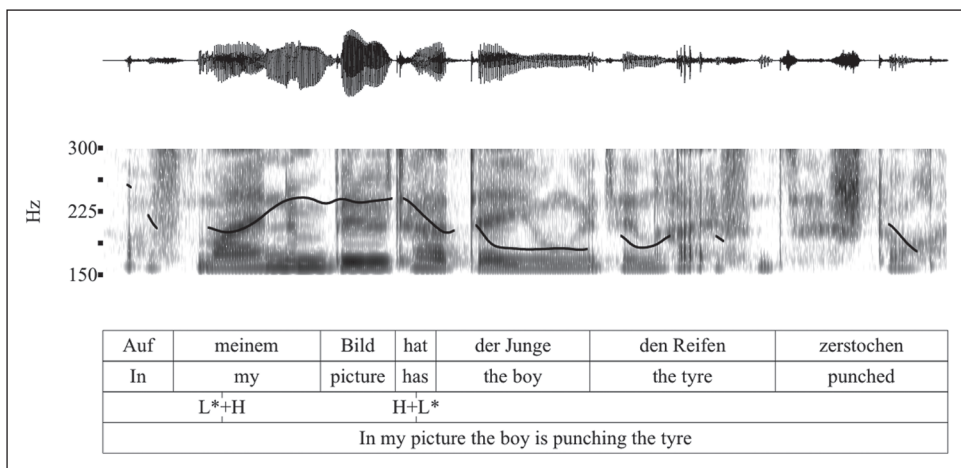





Figure 5. Example pitch track of a hat pattern contour with a rise on *meinem* (realized as L*+H) and a pitch fall on *hat* (realized as H+L*), spoken by a female German speaker. The pitch range is shown linearly from 150 to 300 Hz. Initial and final boundary tones are always low in all productions and therefore not shown in the figures.

Regarding the NVF and VF cases realized with a prosodic break, we first describe all accent realizations of the auxiliary for NVF contexts and compare them to the intonation patterns produced on the auxiliary in VF contexts. The same comparisons will be done for the accent realizations of the subject noun, the object noun and the non-finite verb.

In Table 2, we report the average percentage of occurrence and the standard deviation of each accent type realized on *hat* across both contexts. In NVF contexts, the auxiliary *hat* was generally not accented, with the exception of one case, where it was realized with a *medial* pitch accent (H* L-). On the other hand, in VF contexts, the auxiliary *hat* was mostly accented with the *medial* peak accent H* L- and with the *early* peak accents H+L* and H+!H*, whereas it was left unaccented in only few cases. Furthermore, in 4.6% of the cases the medial peak accent H* L- was *downstepped* (!H* L-) and in 51.4% it was *upstepped* (^H* L-).





The differences of accent realizations according to pragmatic context were statistically tested by performing a multinomial logistic regression analysis (Bates & Sarkar, 2007; Jaeger, 2008). We included *context* as a fixed factor (predictor) and *accentual realization* (H* L-, !H* L-, ^H* L-, H+L*, H+!H*, Unaccented) as a dependent variable. The reference category was set to the pitch accent typically used for focus marking in German, that is, the medial peak H* (e.g. Baumann et al., 2006). The intercept of the model represented the VF context. Not surprisingly, results showed significantly more unaccented auxiliaries in NVF than in VF contexts, $t = 4.62$, $p < 0.0001$, whereas the other accent realizations did not differ significantly across contexts (all p -values > 0.2).

Table 2. The average percentage of occurrence and the standard deviation of accent types realized on the function word *hat* with respective schematic contours (adapted from Grice et al., 2005).

Accents on <i>hat</i>	NVF		VF		Contour
	M (%)	SD (%)	M (%)	SD (%)	
H* L- (incl. !H* L- and ^H* L-)	1.4	3.9	86.7	15.4	
H+L* L-	0.0	0.0	1.6	4.4	
H+!H* L-	0.0	0.0	9.2	14.3	
Unaccented	98.6	3.9	2.5	7.1	

NVF: Non-Verum Focus; VF: Verum Focus.

Table 3. The average percentage of occurrence and the standard deviation of accent types realized on the subject noun with respective schematic contours (adapted from Grice et al., 2005).

Accents on the subject noun	NVF		VF		Contour
	M (%)	SD (%)	M (%)	SD (%)	
H* (incl. !H*)	42.7	20.9	12.5	35.4	
L*	15.5	14.5	2.3	6.4	
L+H*	9.1	10.4	0.0	0.0	
L*+H	9.2	17.1	0.0	0.0	
Unaccented	23.5	26.9	85.2	35.0	

NVF: Non-Verum Focus; VF: Verum Focus.

In Table 3, we report the average percentage and the standard deviation of each accent type realized on the subject noun across contexts. Surprisingly, in NVF contexts, the subject noun was mainly accented. It was produced with one of the following accent types: H* (16.3% of the H* cases were *downstepped*: !H*), L*, L+H*, L*+H. On the contrary, in VF contexts, the subject noun was mainly unaccented. Table 3 shows a frequent occurrence of H* in NVF contexts and a frequent occurrence of unaccented auxiliaries in VF contexts. A multinomial logistic regression analysis with H* as reference category revealed that speakers realized significantly less unaccented subject nouns in NVF than in VF contexts, $t = -3.93$; $p < 0.0001$, statistically confirming the effect of pragmatic condition. Other accent distributions did not differ significantly (all p -values > 0.8).





Finally, in Table 4 we report the average percentage and the standard deviation of each accent type realized on the object noun across contexts. In NVF, the object noun was always accented, predominantly with H* L- or H+L* L- (6.9% of the H+L* cases were *downstepped*: !H+L*). In VF, on the other hand, the object noun was generally unaccented; only in one case it received a pitch accent (i.e. H* L-).

Table 4 shows a frequent occurrence of H* L- realized on the object noun in NVF contexts and a frequent occurrence of unaccented object nouns in VF contexts. A multinomial logistic regression analysis revealed that speakers realized significantly less unaccented object nouns (compared to H* L- set as a reference category) in NVF than in VF contexts, $t = -5.45$; $p < 0.0001$. No other accent distributions differed significantly (all p -values > 0.8). Finally, the non-finite verb was unaccented 97.9% of the time in NVF and 97% of the time in VF contexts. Only in very few cases was it accented (once with H+L* in NVF and once with H* L- in VF). A multinomial logistic regression analysis (with H* L- as reference category) confirmed that accent distributions did not differ significantly according to pragmatic context (all p -values > 0.3). Figures 6(a) and 6(b) show examples of the most typical contours realized by our German speakers in the NVF and the VF condition.

3.4 Discussion

In German, the intonational realizations in NVF and VF conditions were very systematic and – at least as accent placement was concerned – fairly consistent with our predictions derived from previous studies. More specifically, in NVF contexts the auxiliary was generally unaccented and the nuclear accent was produced on the object noun, which is assumed to be the default location for broad focus cases (Büring, 2006; Uhmann, 1991; among others). The most frequent pitch accent realized on the object noun had a *medial* peak (H* L-). However, we found only a few

Table 4. The average percentage of occurrence and the standard deviation of accent types realized on the object noun with respective schematic contours (adapted from Grice et al., 2005).

Accents on the object noun	NVF		VF		Contour
	M (%)	SD (%)	M (%)	SD (%)	
H* L-	57.7	20.2	1.2	3.5	
H+L* L- (incl. !H+L*)	33.9	27.1	0.0	0.0	
L+H* L-	1.4	3.7	0.0	0.0	
L*+H L-	5.8	7.9	0.0	0.0	
Unaccented	1.2	3.3	98.8	3.5	

NVF: Non-Verum Focus; VF: Verum Focus.

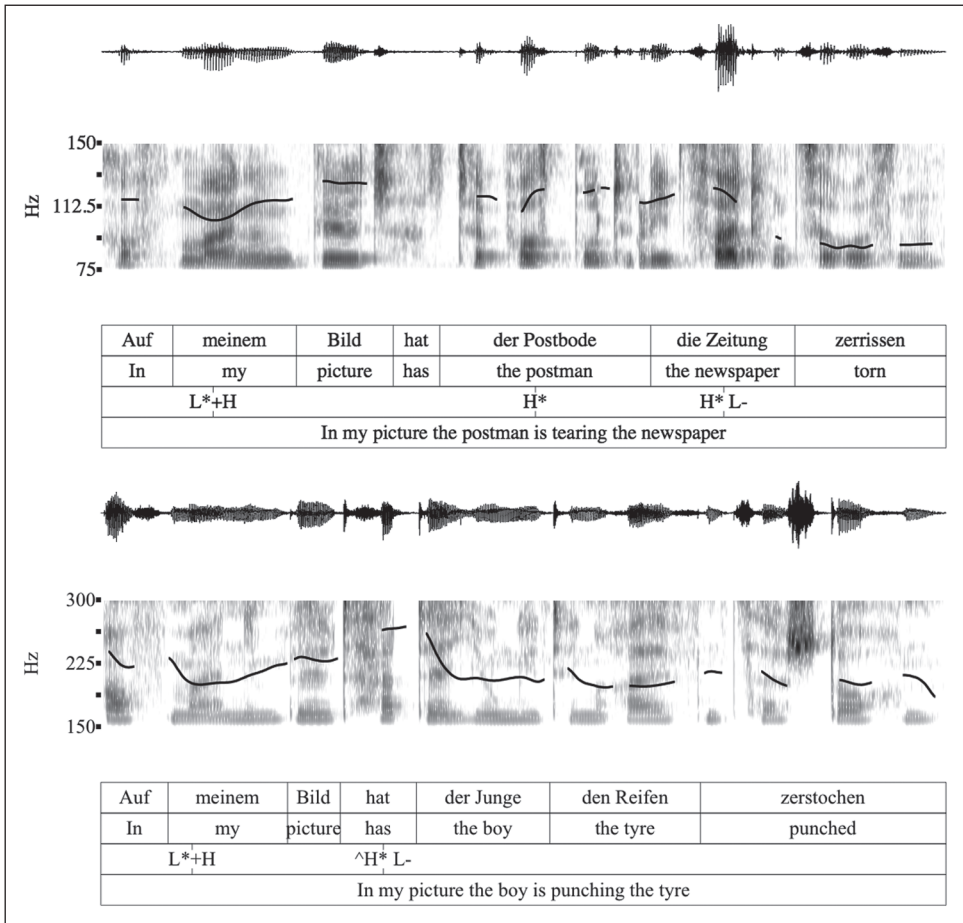


Figure 6 (a)-(b). Example pitch tracks of NVF utterance (upper panel) with an unaccented auxiliary *hat* and an accented object noun *die Zeitung* and of VF utterance (lower panel) with an accented auxiliary *hat* and an unaccented object noun *den Reifen*, spoken by a female German speaker. In the upper panel figure, the pitch range is shown linearly from 75 to 150 Hz, in the lower panel picture from 150 to 300 Hz.

downstepped accents in NVF with broader focus (!H* L-); far fewer than in other studies comparing broad and narrow focus realizations. It is conceivable that *downstepped* nuclear accents are more frequent in reading tasks than in more engaging dialogue tasks (e.g. Baumann et al., 2006; Féry & Kügler, 2008). If this assumption were correct, then *downstep* would not only be influenced by focus conditions, but also by the degree of interaction (i.e. read speech vs. conversational setting). An alternative explanation for the surprisingly few *downstepped* accents is that our broad focus cases were information-structurally more complex than in earlier studies, due to the additional contrast in the topic location in the preverbal field. What also surprised us was that the subject noun was realized with a pitch accent in 76.5% of the NVF cases (i.e. H*, L*, L+H*, L*+H), although it was clearly *given* (both visually and auditorially). It is likely that the accent on the subject noun was placed for rhythmic reasons, avoiding a long sequence of unaccented material between the pitch accent realized on the contrastive topic *Auf meinem Bild* and the pitch accent on the object noun (Büring, 2006, 2007). Such rhythmic accents are only legitimate before the nucleus. It is therefore not surprising that the subject noun was generally left unaccented in VF contexts,

where the subject followed the nuclear accent on the auxiliary. The results on the pitch accented subject noun in NVF suggest that clear correspondences between activation states and pitch accent types are more meaningful for nuclear accents than for prenuclear ones.

More important for our investigation is the realization of Verum Focus, which in our data was typically marked with a nuclear accent on the auxiliary *hat* (H* L-), followed by unaccented post-focal elements (i.e. subject noun, object noun and non-finite verb). The preference for the *medial* peak accent (H* L-) in VF contexts is in line with previous studies on narrow focus marking in German (e.g. Baumann et al., 2006; Féry & Kügler, 2008). In the majority of the cases the post-focal elements (i.e. subject noun, object noun, and non-finite verb) were indeed unaccented. This post-focal deaccentuation is typical for many languages including German (e.g. Féry & Kügler, 2008; Hanssen, Peters, & Gussenhoven, 2008; Xu, 2005). Hat patterns were very rare in our data, replicating the observation by Braun (2006) in a more interactive speech style. Consistent with previous claims, they only occurred in VF contexts with a double contrast. The few instances that were produced do not allow us to make strong claims about the phonological structure of hat patterns in German. The only commonality was an L*+H pre-nuclear accent on the possessive pronoun.

From an information structure viewpoint, the experiment also confirmed previous VF proposals on the relationship between finite verb, polarity focus and accent placement (cf. Höhle, 1992; Klein, 1998, 2006). In order to find out whether such a relationship also holds in languages other than German, the experiment was carried out with French speakers. Before we turn to the experiment, we first discuss possible effects of Verum Focus on the phonological system of French in the next section.

4 Background on French intonational phonology

4.1 Phrasing and accent patterns

We mainly rely on the description of French intonation in the Autosegmental-Metrical (AM) framework proposed by Jun and Fougeron (2000, 2002). Other models are only taken into account when necessary, for instance when discussing phonological aspects of French focus marking (e.g. Di Cristo, 1999, 2000).

There is general agreement that French has two levels of prosodic phrasing: the IP is the highest level and includes one or more accentual phrases (APs). More recently, an intermediate level of phrasing (ip) has also been attested, coinciding with major syntactic boundaries, e.g. between a complex subject noun and the verb (cf. D'Imperio & Michelas, 2010; Michelas & D'Imperio, 2010). Typically, an AP comprises a content word, optionally preceded by one or more function words. In French, this phrasal unit represents the domain of stress.

A typical tonal realization of an AP is featured as /LHiLH*/ in the French AM model (Jun & Fougeron, 2000, 2002). This default pattern is characterized by an *optional* initial accent (Hi)¹⁰ and an *obligatory* final accent (H*); in utterance-final APs, the final accent is realized mostly as L%. The initial accent is located near the left-edge of the AP, the final accent is constantly associated with the final full syllable of a content word, at the right-edge of the AP. This tonal realization corresponds to the “bridge accent”¹¹ (*arc accentuel*), as described in other models of French intonation (e.g. Di Cristo, 1999, 2000). Depending on rhythmic constraints, each of the tones can be under-shot. Authors further more agree upon the fact that this pattern is dictated by structural rules (i.e. a *bipolarization principle*): initial and final accents contribute to the rhythmic organization of the accentual phrase (i.e. *rhythmic* function) and signal the beginning and the end of this unit (i.e. *demarcative* function). Besides that, both Hi and H* can function as *loci* of the focal/emphatic

accent (Hf, see section 4.2). In the AM model adopted here (Jun & Fougeron, 2000, 2002), the initial accent is regarded as a *phrase accent*, the final accent as a *pitch accent*. Note however that the status of the initial accent is still a matter of dispute.¹²

While the acoustic properties and the role of the final accent are largely uncontroversial, factors influencing the occurrence of the initial accent are still under debate. There is evidence suggesting that performance-related factors (e.g. speaking rate, speaker idiosyncrasies), structural factors (e.g. utterance position, length of the AP, syntax) and pragmatic factors (e.g. correspondence between AP and focus) all affect the presence of initial accents and thus the accentual realization of an AP.¹³

One of the most well-documented constraints on the presence of initial accents is the number of syllables and the duration of the AP (i.e. initial accents are more frequent in APs made of content words with more than three syllables, Jun & Fougeron, 2002; Welby, 2006). For example, in two-syllable APs (or in fast speaking rate conditions), the full pattern LHiLH* can be undershot and give rise to other tonal realizations, which we illustrate in Table 5 (tonal patterns that are not realized due to undershoot are printed in square brackets).


Recently, German and D'Imperio (2010) showed that focus marking can also have an effect on the distribution of the initial accent, over and above an effect of AP length. More specifically, the authors investigated whether initial accents occur more often at the left-edge of focused than unfocused APs in interrogatives. They reported that the distribution of the initial accent is linked to information structural boundaries (more initial accents at the start of a focus domain).

Even more relevant to our interest in Verum Focus realizations is the relation between the morphological status of the word and the occurrence of the initial accent. A few investigations (e.g. Welby, 2006) have shown that the initial accent is typically realized on one of the first syllables of content words (*mots accentogènes*, cf. Garde, 1968), but not on monosyllabic function words (*mots non accentogènes* such as determiners, prepositions, auxiliaries, etc. cf. Garde, 1968), which are usually proclitized to the following noun (Delais-Roussarie, 1999). For instance, according to Jun and Fougeron's model (2002), the tonal pattern HiLH* (*d* in Table 5), with the undershot initial elbow (L) should be realized only when the AP starts with a content word (see also Welby, 2003).¹⁴

4.2 Focus marking

The notion of an emphatic/focal accent in French is controversial. First, it is very often confounded with the initial (rhythmic) accent (Hi), possibly because of its placement on one of the initial syllables of the AP-initial content word. Furthermore, what makes this notion complex is the fact that authors assume the existence of more than one type of emphatic accent: the *intensifying* accent (i.e. highlighting a word at the syntagmatic level, that is, relative to other words in the utterance) and

Table 5. Schematic F0 contours of the default tonal pattern LHiLH* and its variants. Square brackets indicate undershot tonal targets (adapted from Jun & Fougeron, 2000, 2002).²¹

Tonal patterns	Schematic contours
LHiLH*	
a. L[HiL]H*	
b. L[Hi]LH*	
c. LHi[L]H*	
d. [L]HiLH*	
e. LHiL[H*]	

the *contrastive* accent (i.e. highlighting a word on a paradigmatic dimension, relative to a limited set of alternatives, Di Cristo, 1999, 2000). As a matter of fact, experimental investigations have not supported such a distinction from an acoustic and perceptual viewpoint (e.g. Touati, 1987). Therefore, we shall adopt the general notion of what is commonly referred to as *focal* accent (Hf, cf. Bruce & Touati, 1990; Di Cristo, 1998; Jun & Fougeron, 2000) produced by French speakers in narrow focus contexts.¹⁵

Many studies on French focus marking have shown that a Subject-Verb-Object (SVO) utterance in a narrow focus context can have a different level of phrasing and/or tonal realization than the same utterance in a broad focus context. More specifically, in broad focus SVO utterances, initial and medial APs are typically realized with the default pattern /LHiLH*/, AP length permitting (cf. section 4.1). In narrow focus contexts, the focused constituent is realized with the Hf variably located on Hi and/or on H* (e.g. Fónagy, 1979; Garde, 1968; Séguinot, 1976), mainly depending on speaker's choice (Dahan & Bernard, 1996; Jun & Fougeron, 2000). The Hf is characterized by extra-pitch prominence, longer syllable duration and an increase in intensity (e.g. Dahan & Bernard, 1996; Dohen, Loevenbruck, Cathiard, & Schwartz, 2004; Jun & Fougeron, 2000; Rossi, 1999). Also, it can be occasionally preceded and/or followed by a pause (e.g. Dahan & Bernard, 1996; Féry, 2001; Séguinot, 1976). The post-focal region is deaccented (e.g. Delais-Roussarie, Rialland, Doetjes, & Marandin, 2002; Di Cristo, 1998; Jun & Fougeron, 2000). The pre-focal region is realized with a compressed pitch range and its last full syllable is lengthened, suggesting an ip-break before the focal domain (cf. Dohen & Loevenbruck, 2004).¹⁶

Thus, most of the studies on French focus marking have investigated acoustic correlates of the Hf or observed its variable location (on the Hi and/or the H*) within focused APs (e.g. Dahan & Bernard, 1996; Dohen & Loevenbruck, 2004; Jun & Fougeron, 2000). These observations were mainly conducted in read speech (e.g. Dahan & Bernard, 1996; Féry, 2001; Jun & Fougeron, 2000), which may differ from more spontaneous speech styles (cf. Grice, Savino, & Refice, 1997). Furthermore, previous work has always tested cases of narrow/contrastive focus on content words. In the specific case of focused function words, it is possible that this pragmatic factor can result in the realization of an Hf on monosyllabic proclitics (cf. Di Cristo, 1999, 2000), even though they are considered as non-accentable for rhythmic reasons (cf. section 4.1). This proposal, however, has never been tested with focused phonologically weak words like monosyllabic auxiliaries. Hence, we investigate whether or not the focal accent is realized on monosyllabic auxiliaries and, if so, how its presence modifies the tonal pattern of the verb phrase. Extending the investigation to other types of foci will provide a more complete picture on the interaction between pragmatic and structural constraints in French.

The starting point of our study is the above-mentioned semantic principle, which claims that focus on the positive polarity is formally associated with the finite verb (here, the auxiliary). Consequently, in VF cases, the auxiliary should be accented for assertion validation purposes (cf. Klein, 1998, 2006).

5 The study: experiment 2

5.1 Methods

We replicated Experiment 1 with French participants, using comparable materials and the same procedure.

5.1.1 Participants. Eight French native speakers (two male and six female, average age = 29.6 years, *SD* = 2.1) were recorded. They were master students at the University of Paris VIII, PhD students or sociology researchers at the CNRS in Paris. The participants originated from different

parts of France and had been living in Paris at the time when they took part in the experiment. None of them had learned a language other than French before the age of 10. Furthermore, none of them had a reported history of speech/language impairment or other developmental deficits. They all received a small fee for their participation.

5.1.2 Materials. The experimental conditions were identical to those in the German production study. Again, we compared identical utterances elicited in different contexts, here (3)b to (4)b.

- (3) French VF mini-dialogue example between the confederate and the participant prompted by the three pictures:

Baseline picture (child tearing a banknote)

Confederate's picture (the child not tearing the banknote):

a. Sur mon image l' enfant n' a pas déchiré le billet

In my-F.SG picture the-F.SG child NEG has NEG torn the-M.SG banknote

Participant's picture (the child tearing the banknote):

b. Sur mon image l' enfant [a]_F déchiré le billet

In my-F.SG picture the-F.SG child has torn the-M.SG banknote

- (4) French NVF mini-dialogue example between the confederate and the participant prompted by the three pictures:

Baseline picture (a postman)

Confederate's picture (the postman delivering a package):

a. Sur mon image le facteur a livré un colis

In my-F.SG picture the-M.SG postman has delivered a-M.SG package

Participant's picture (the postman tearing a newspaper):

b. Sur mon image le facteur [a déchiré un journal]_F

In my-F.SG picture the-M.SG postman has torn a-M.SG newspaper

In all target trials the auxiliary was expressed with the monosyllabic *a* ("has") followed by disyllabic and trisyllabic non-finite verbs. A list of stimuli and number of syllables of the non-finite verbs are provided in in Table A2 in the Appendix.

A male French Parisian confederate speaker (23 years old) produced the context utterances. He was instructed to keep eye-contact and to use the same intonation contour for all participants in a natural way. In NVF he mostly produced the utterance in three APs: the utterance-initial prepositional phrase, the subject noun, and the verb phrase. Only rarely, when the object was long, it was phrased separately, resulting in four APs. All APs were realized with the LHiLH* default pattern

or with its allophonic variants (depending on the AP's number of syllables). The same held for the VF condition, with the exception of the verb phrase in which a focal accent was realized on the negation particle *ne...PAS* ("not") (e.g. LHfL%).

5.1.3 Procedure. The French group was tested in a quiet room at the Department *Structures Formelles du Langage* UMR 7023 (CNRS) in Paris with the same procedure as used for the German group.

5.1.4 Research questions and predictions. Our primary question was whether French speakers mark Verum Focus with a focal accent on the auxiliary, the carrier of the assertion. We predicted that if the semantic principle (i.e. a direct relationship between finiteness, polarity focus and accent placement) proposed for German applied to French too, French speakers would place a focal accent on the auxiliary in the VF condition, but not in the NVF condition, resulting in a phonological distinction between the two contexts.

On the other hand, if such a semantic principle does not apply (or is weighted less strongly than structural constraints that disallow accented monosyllabic auxiliaries in AP-initial position), we expected the realization of an Hi on one of the first syllables of the non-finite verb. In principle, an initial accent on the non-finite verb could occur in VF and NVF cases alike, given that the focal domain starts at the auxiliary in both contexts. In other words, the auxiliary should be located at the left-edge of a focused AP in both contexts (cf. German & D'Imperio, 2010). We tested whether in cases with an Hi on the non-finite verb, speakers realize an Hf to distinguish VF from NVF contexts and if so, *where* they locate Hf (on Hi and/or on H*). Our focus is hence on the prosodic realization of the verb construction (the finite verb followed by the non-finite verb).

5.2 Data selection

For the French dataset, the 192 productions were coded on the phrase (AP), word and syllable level using Praat (Boersma & Weenik, 2009). We discarded 33 NVF utterances in which participants produced pauses within phrases, hesitations or disfluencies; 29 NVF and 12 VF utterances with different tenses or aspects (e.g. use of the aspectual construction *être en train de*) and 15 VF utterances with a verb different from that of the confederate. This left 34 NVF and 69 VF cases for analysis. The utterances were analyzed and labeled using the model described in Jun and Fougeron (2000, 2002) for French (cf. section 4.1). The first author labeled all the data. The third author annotated a random sample of 40% of the dataset (VF and NVF) for each context to compute inter-rater reliability scores. In cases of disagreement we chose the annotation of the first author.

5.3 Results

The interrater reliability score for the verb construction had a Kappa Coefficient of Agreement of 0.93 ($SD = 0.04$) for the categories LH*, LHiH*, HiLH*, LHiL* (see letters *a, c, d, e* in Table 5). For the object noun, Kappa was 0.79 ($SD = 0.11$) for the accentual realizations HiLL%, LHiL% and Unaccented.

On the basis of previous studies reporting the presence of initial accents on the left-edge of focused APs (cf. German & D'Imperio, 2010), we investigated their occurrence in both conditions. Furthermore, we tested whether their location (i.e. on the auxiliary or on one of the first syllables of the non-finite verb) is influenced by pragmatic condition. For the identification of initial accents, we largely followed the criteria defined by German and D'Imperio (2010). Initial accents that were realized on the auxiliary were coded as FW-Hi (function word), those on one of the first two syllables of the non-finite verb as CW-Hi (content word), and the absence of an initial accent as No-Hi.

When initial accents were realized on the auxiliary, they were either followed by a final high accent (labelled as HiLH*) or by a final low accent (HiLL*), both realized on the last syllable of the non-finite verb.

Initial accents on the non-finite verb (CW-Hi) generally had a peak on one of the first two syllables of the content word. These were always preceded by an elbow (L)¹⁷ between the auxiliary and the non-finite verb (see Welby, 2006). In verb phrases with disyllabic non-finite verbs (e.g. *vidé*), the initial accents were located on the first syllable of the non-finite verb. In trisyllabic non-finite verbs (e.g. *réveillé*), the initial accents were either located on the first ($n = 16$) or second syllable ($n = 12$). Table 6 displays the distribution of initial accents on the auxiliary (FW-Hi), on one of the first two syllables of the non-finite verb (CW-Hi) and cases without an initial accent (No-Hi) across contexts.

The first thing to note from Table 6 is that initial accents on the FW were realized only in VF cases. We tested whether this effect of pragmatic context was reliable over and above speaker specific preferences (cf. Dahan & Bernard, 1996) and the length of the AP (e.g. Jun & Fougeron, 2000, 2002; Welby, 2006). To this end, we calculated a binomial logistic regression model (Baayen, 2008; Pinheiro & Bates, 2002) with *FW-Hi* as dependent variable (the first row of Table 6 was coded as “Yes” and the remaining rows coded as “No”), and context (NVF, VF) and number of syllables of the verb construction (3, 4) as predictors. Finally, *speaker* and *item* were added as crossed random factors (allowing for speaker- and item-specific intercepts and slopes).¹⁸ The model revealed that there was a significant effect of context, $z = 2.37$, $p < 0.05$, but no effect of number of syllables, $p = 0.9$, and no interaction, $p = 0.9$. Thus, the analysis confirms that French speakers realize an Hi on the auxiliary only in VF contexts.









In what follows, we will investigate the accent types in the two conditions in more detail. Table 7 shows the distribution of each accent pattern realized on the verb construction.

Table 6. The average percentage of occurrence and the standard deviation of initial accents realized on the function word *a* (FW-Hi), on one of the first two syllables of the content word (CW-Hi), or not realized at all (No-Hi) across NVF and VF contexts.

Initial Accents (Hi)	NVF		VF	
	M (%)	SD (%)	M (%)	SD (%)
FW-Hi	0.0	0.0	27.9	33.1
CW-Hi	35.3	15.4	46.9	31.4
No-Hi	64.7	15.4	25.2	18.9

NVF: Non-Verum Focus; VF: Verum Focus.

Table 7. Average percentage of accent patterns (second column) realized on the auxiliary plus the non-finite verb and relative schematic contours aligned with a text example *la réveillé* (“has woken up”). Accent patterns are grouped according to the presence of an initial accent on the auxiliary (FW-Hi) or on one of the first two syllables of the content word (CW-Hi) or the absence of an initial accent (No-Hi). Percentage distributions of accent patterns are separated from one another by a slash.

Initial Accents (Hi)	Accent patterns on the verb construction	NVF (%)	VF (%)	Contour
FW-Hi	HiLH* / HiLL*	0.0 / 0.0	27.6 / 5.7	 
CW-Hi	LHiL* / LHi	0.0 / 0.0	11.6 / 4.3	 
	LHiH* / LHiLH*	29.3 / 6.0	17.4 / 8.7	 
No-Hi	LH* / LLH*	41.2 / 23.5	20.3 / 4.4	 

NVF: Non-Verum Focus; VF: Verum Focus.

From Table 7 we notice that there are two further accent types that only occur in VF contexts, LHiL* and LHi. Hence, in 49.2% of the cases French speakers distinguish the pragmatic difference between NVF and VF by means of different accent types. In 33.3% of the cases they realized an initial accent on the monosyllabic FW and in 15.9% of the cases, they produced an initial rise on one of the first syllable(s) of the non-finite verb, without a subsequent high AP-final accent.

In the remaining 50.8% of the cases NVF and VF appear to be marked with the same tonal realizations (i.e. LHiLH*, LHiH*, LLH*, LH*). Results of a multinomial logistic regression analysis showed that compared to the occurrence of the default pattern LHiLH*, all other accent types had the same distribution, LH*: $t = -1.09$, $p = 0.2$; LHiH*: $t = -0.85$, $p = 0.4$; with the exception of LLH*: $t = -1.81$, $p = 0.06$, which appeared to be marginally more frequent in an NVF than in VF context. As it stands, the analysis so far reveals that there is no clear pragmatic context effect on the choice of the accent patterns LH*, LHiH*, LLH*, LHiLH*.

We now turn to the second research question of our investigation in French, whether the Hf is located on the Hi and/or on H* in tonal patterns where both accents are realized (i.e. HiLH*, LHiH*, LHiLH*). We first investigated the HiLH* accent pattern, which only occurred in VF contexts. An indication for a focal accent Hf on the initial accent is that its peak is higher than the peak of the final accent (e.g. Dahan & Bernard, 1996; Dohen & Loevenbruck, 2004; Jun & Fougéron, 2000). In our HiLH* cases, the peak of the initial accent was on average 23.5 Hz higher than the peak of the final accent. However, different from the F0 values reported in Hz, measurements taken in semitones better account for speaker and gender-related variability. Thus, we computed the semitone difference between the height of the peak of the initial accent on the auxiliary (H1 in Hz) and the height of the peak of the final accent of the last syllable on the non-finite verb (H2 in Hz).¹⁹ A one-sample t -test confirmed that the semitone difference between H1 and H* was significantly different from zero, $t = 5.15$, $df = 20$, $p < 0.0001$ (average semitone difference = 1.8). The average semitone difference of 1.8 between H1 and H* suggests that the Hf was realized on the initial accent.²⁰ An example of an Hf realized on the Hi of an HiLH* pattern is shown in Figure 7.

Next, we extended our analysis to LHiLH* and LHiH*, i.e. two-peak accent patterns that were realized in both contexts, to investigate whether context affects fine phonetic detail in accent realization. To this end, we calculated the semitone difference between the height of the peak of the

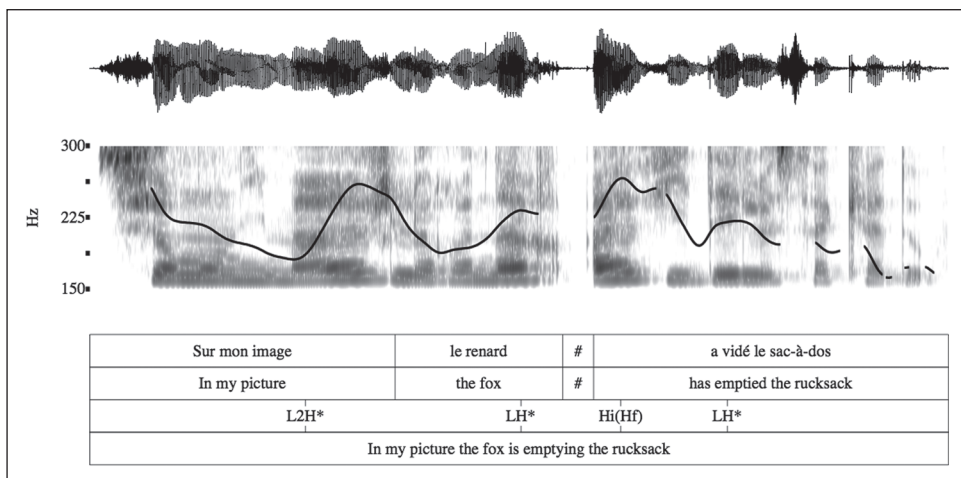


Figure 7. Example pitch track of a VF utterance with an Hf on the auxiliary in HiLH* cases, spoken by a female French speaker. The pitch range is shown linearly from 150 to 300 Hz.

initial accent realized on one of the first syllables of the non-finite verb (H1 in Hz) and the height of the peak of the final accent of the last syllable of the non-finite verb (H2 in Hz) and subjected it to a linear mixed effects regression model (Baayen, 2008) with *tonal scaling* as dependent variable and *accent pattern* (LHiH*, LHiLH*), *context* (NVF vs. VF) and *number of syllables* between the two peaks as fixed factors. The model allowed for individual adjustments of the intercept for speakers and items. To test the validity of the model, data points with residuals larger than 2.5 standard deviations from the mean were removed and the model was refitted. Resulting *p*-values were estimated as the posterior probability of a Markov Chain Monte Carlo (MCMC) simulation with 10000 runs. Results showed that there was a significant main effect of *context* ($\beta = -0.88$, *Lower Bound* = -1.26 , *Upper Bound* = -0.51 , $p < 0.0001$), no effect of *accent pattern* ($p = 0.8$), *number of syllables* ($p = 0.2$) and no interactions of the control variables with context (all *p*-values > 0.7): while the final accent was on average 1.08 semitones higher than the initial one in NVF contexts, the two peaks were equally high in VF contexts (see Figure 8). Hence in NVF contexts, which are not expected to attract an Hf, the final H* is realized with a higher peak than the initial Hi.

We finally present the accentual patterns realized on the object noun across both contexts. The multinomial logistic regression analysis with *accent pattern* as the dependent variable and *context* as the fixed factor (HiLL% was the reference category) revealed significantly fewer unaccented object nouns in NVF than in VF contexts, $t = -5.41$, $p < 0.0001$. Other accentual patterns did not differ significantly according to context (all *p*-values > 0.8). This corroborates previous findings that report deaccentuation of post-focal APs (e.g. Delais-Roussarie et al., 2002; Dohen & Loevenbruck, 2004; Jun & Fougeron, 2000). The occurrence of accent patterns on the object noun are shown in Table 8.

5.5 Discussion

The semi-spontaneous productions elicited with French speakers revealed that in half of the cases, VF is *phonologically* distinct from NVF cases, given the exclusive occurrence of the accent patterns

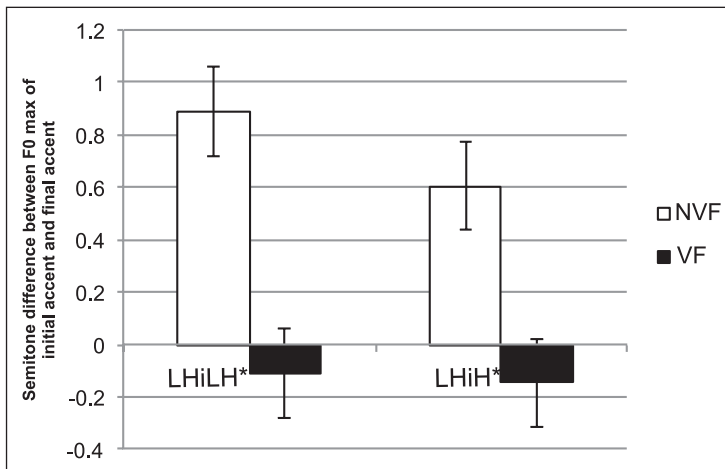


Figure 8. Semitone difference between F0 maximum of the initial and final accent, $\Delta ST = 12(\log_2 H1 - \log_2 H2)$, in LHiLH* and LHiH* accent patterns across NVF and VF contexts. Mean values are based on the statistical model and whiskers represent standard errors. Positive values indicate that the final accent is higher than the initial accent.

NVF: Non-Verum Focus; VF: Verum Focus.

Table 8. The average percentage of occurrence and the standard deviation of accent patterns on the object noun across NVF and VF contexts.

Accent patterns on the object noun	NVF		VF	
	M (%)	SD (%)	M (%)	SD (%)
HiLL%	38.4	39.5	2.2	4.0
LHiL%	57.5	36.2	4.1	5.7
Unaccented	4.1	10.8	93.7	7.2

NVF: Non-Verum Focus; VF: Verum Focus.

HiLH*, HiLL*, LHiL*, and LHi in VF contexts. In the other half of the cases, there was no phonological difference across conditions; the accent patterns LH*, LHiLH*, LLH*, and LHiH* occurred equally often in NVF and VF contexts.

We will first direct our attention to the phonological distinction across pragmatic conditions, which lend some support to a direct relation between pragmatic focus and focal accent location. While two of the accentual realizations produced in Verum Focus (LHi and LHiL*) have been previously reported to occur in narrow focus contexts (e.g. Jun & Fougeron, 2000), two of the patterns we found have never been documented before (HiLH* and HiLL*). Conceivably, the occurrence of HiLH* and HiLL* can be attributed to our specific materials (i.e. APs consisting of function and content words compared to APs consisting of content words only, see Jun & Fougeron, 2000, 2002; Welby, 2003). Acoustic analyses showed that for the HiLH* pattern, the height of the Hi placed on the auxiliary was significantly higher than the peak of the AP-final H* (realized on the last syllable of the non-finite verb). This provides evidence for the presence of a focal accent on the Hi. Taken together, these findings indicate that the semantic principle to accent focused constituents holds to some degree also for French. The fact that the auxiliary is accented in only one third of the cases suggests that structural constraints are ranked somewhat higher than pragmatic constraints; however, the occurrence of accented auxiliaries also points to an instable constraint ranking (e.g. Holt, 2003).

In the other half of the cases, speakers used accent types that occurred equally often in NVF and VF contexts (i.e. LHiLH*, LHiH*, LLH*, LH*). This equal distribution of accentual realizations across contexts seems to undermine our tentative suggestion that French speakers ARE able to mark Verum Focus on phonologically weak elements such as auxiliaries. This phonological view, however, hides some more interesting phonetic differences across contexts (reminiscent of phonetic differences in phonologically ambiguous focus structures in Germanic languages). An analysis of peak height differences between initial and final accents suggests that in NVF contexts the focal accent is realized on the H* rather than on the Hi (higher peaks on final H* compared to initial Hi), whereas in VF, both accents have equal scaling. On the other hand, there might not be an Hf in these Verum Focus contexts at all, given that the peak scaling differences in the accent types that only occurred in Verum Focus were considerably larger. No matter how the NVF peak scaling differences are interpreted, the VF peak scaling gives more emphasis to the initial accent than to the final accent (compared to the peak scaling in NVF contexts). Hence, whenever there is no focal accent mediating the relation between polarity focus and finite verb, "asserting" on the polarity is realized by scaling down the generally high pitch on the final accent. We are looking forward to investigating this issue in more detail in future studies.

Not surprisingly, the object noun following the analytic verb construction was mostly unaccented in VF contexts but not in NVF contexts (e.g. Jun & Fougeron, 2000). This clear difference across

pragmatic conditions shows that the pragmatic manipulation in the experiment was successful. From a perceptual point of view, the information structure might be decoded at the latest when processing the object noun. The presence of phonological and phonetic cues to disambiguation at the verb construction, however, suggests that listeners would be able to arrive at the correct information structural interpretation already while processing the verb construction (e.g. for the use of fine phonetic detail during online speech comprehension, see Dahan, Tanenhaus, & Chambers, 2002; Salverda & Tanenhaus, 2010). Future studies will have to investigate whether the probabilistic cues to information structure in the verb construction can indeed be used by French listeners.

6 Conclusion and future work

In the present study we investigated the phenomenon of Verum Focus, a contrast in the polarity of an utterance, which is typically marked by a pitch accent on the finite verb in Germanic languages (i.e. *the child IS tearing the banknote* as an opposite claim to *the child is not tearing the banknote*, Höhle, 1992; Klein, 1998, 2006). By using a semi-spontaneous task in mini-dialogue form, we tested how intonation marks the relation between Verum Focus and monosyllabic auxiliaries, i.e. phonologically weak forms, in German and French. Going one step further, we also touched upon more specific issues regarding the phonology of these two languages, which were discussed in more detail in the respective discussion sections above.

The first part of the investigation conducted on German (Experiment 1) confirmed previous semantic/pragmatic proposals on the relationship between *finiteness* (finite verb), polarity focus and accent placement (cf. Höhle, 1992; Klein, 1998, 2006). The functional importance that finite elements play in Germanic languages (cf. Bernini, 2009; Dimroth et al., 2010) is signaled by a systematic accentual prominence on the finite form of the verb. Compared to cases where the auxiliary is by default unaccented (i.e. non-Verum Focus condition), German speakers typically produced a nuclear pitch accent (H* L-) on the auxiliary *hat* in Verum Focus contexts; the auxiliary was hence promoted as the carrier of the assertion validation. Phonologically speaking, in terms of accent placement and accent type, the intonational realizations were quite consistent with previous studies on focus-marking in German (e.g. Baumann et al., 2006; Féry & Kügler, 2008). Another way to mark Verum Focus is via hat pattern contours, whose presence in more spontaneous speech was attested for the first time in this study. However, these contours were only rarely produced by German speakers. Even though this tonal pattern has been argued to facilitate the production of accents in close succession (Levelt, 1989 for Dutch), our German speakers chose to phrase both contrasts (i.e. on the topic and on the polarity) separately in the majority of the cases. A further aspect that deserves attention is the presence of “ornamental accents” (Büring, 2006, 2007) on the contextually given subject nouns, which were probably realized due to rhythmic organization principles. As a side remark, it is interesting to notice that even in a language like German, where there is a strong relation between intonation and information structure, structural/rhythmic principles can outweigh pragmatic aspects (i.e. the *activation status* of referents, cf. Baumann & Grice, 2006), at least in prenuclear position.

The interaction between structural and pragmatic factors was also observed in French (Experiment 2). In this language, phrasing and tonal constraints might work against the representation of Verum Focus as a typical case of intonational narrow focus expressed on the monosyllabic auxiliary. Following previous work on the interface between intonation and information structure, it was predicted that if auxiliaries were the carriers of the assertion validation (i.e. in Verum Focus contexts), this pragmatic function would be marked by the presence of a focal accent. In order to associate Hf with the auxiliary, the default tonal pattern of the accentual phrase (i.e. LHiLH*) has

to be phonologically restructured, and constraints against placing initial accents on monosyllabic phrase-initial function words need to be outweighed. Our findings indeed show that in 33.3% of the Verum Focus cases the auxiliary was realized with a focal accent (Hf). In another 15.9% of the cases, a focal accent was realized on one of the first syllables of the non-finite verb (i.e. LHiL*, LHi) with no following AP-final accent – again, these accent types only occurred in Verum Focus cases. Hence, in half of the cases, French speakers phonologically distinguished Verum Focus from non-Verum Focus on the verbal construction. While some of these accentual realizations (i.e. LHiL*, LHi) have been already reported in previous work on narrow focus marking (e.g. Jun and Fougeron, 2000), this study is the first to show the presence of a focal accent on monosyllabic function words (i.e. HiLH*, HiLL*).

Overall, if we compare the two languages in question, we get a clear understanding of how Verum Focus is typically marked in German, whereas for French, the unsystematic occurrence of the focal accent on the auxiliary and the wide range of intonational patterns realized within the targeted AP (including the finite and non-finite verb) open a new field for future work. As a preliminary conclusion, we think that the functional importance ascribed to the finite elements in Germanic languages either may not be attributable to French, as suggested by recent cross-linguistics studies on Germanic and Romance languages (cf. Bernini, 2009; Dimroth et al., 2010), or simply does not surface most of the times due to phonological constraints of the auxiliary, which is a phonologically weak element. The quite frequent occurrence of phonological differences for Verum and non-Verum Focus contexts and further phonetic differences in peak scaling across contexts lends support to the latter assumption. But in the end, more data (also from online speech perception studies) is necessary to adjudicate between these two explanations.

Obviously, the current results have implications for (tutored and untutored) second language acquisition (L2). Given the differential results for German and French Verum Focus marking and widely attested effects of L1 prosodic “transfer” on L2 (e.g. Braun & Tagliapietra, 2011; Mennen, 2004; Rasier & Hilgsmann, 2007), the intonational marking of Verum Focus can represent a learnability problem for learners of both languages.

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Notes

1. Other focus readings are also possible, like a reply to a *yes–no* question or a focus on the temporal aspect of the action, but they will not be discussed here. For details, see Klein (1998, 2006).
2. The same phenomenon is also referred to as *polarity focus* (e.g. Dik, 1981; Gussenhoven, 1983; Holmberg, 2007), *auxiliary focus* (Hyman & Watters, 1984) or *predicate/predication focus* (Güldemann, 2003).
3. In the German and French utterances, the elicited verb construction is inflected in present perfect tense (i.e. the auxiliary followed by a non-finite verb). In English a direct translation in the present perfect would be ungrammatical as the presence of the utterance-initial adverbial construction (*In my picture*) requires a simple past tense. The correct English translations of the German and French stimuli are provided in Appendix. However, throughout the paper, the English translations will be given in the

- progressive form (-*ing* construction), rather than the past tense as this allows us to preserve the analytical construction of the verb (i.e. finite verb plus non-finite verb).
4. This prosodic unit is known by many names, see Lacheret-Dujour and Beaugendre (1999) for a review.
 5. For an analysis of the other conditions see Turco (2013).
 6. Audio file examples of the confederate speaker's productions are provided online at the following website: <http://ling.uni-konstanz.de/pages/home/braun/forschung.html>.
 7. Kappa was calculated by using the following formula: $Kappa = (Po - Pc) / (1 - Pc)$. The observed percentage of agreement (Po) is the proportion of ratings where the raters agree on accent types. The expected percentage (Pc) is the proportion of agreements that are expected to occur by chance, as a result of the raters scoring in a random way. Thus, Kappa is calculated as the proportion of agreements that is actually observed between raters, after adjusting for the proportion of agreements that occur by chance.
 8. Due to the small data set, *downstepped* and *upstepped* accents such as !H*L- and ^H*L- were collapsed into the category H*L-.
 9. The initial accent is also called a *secondary stress* or *secondary accent* (Fónagy, 1979; Padeloup, 1990), *rhythmic regulatory stress* (Delais-Roussarie, 1994), etc. The final accent is also referred to as *primary stress*, *primary accent* (Fónagy, 1979; Padeloup, 1990), *internal accent* (Rossi, 1993), etc.
 10. Note that the French "bridge accent" should not be confused with the German "bridge accent" or "hat pattern".
 11. Other researchers (Di Cristo, 1998, 1999, 2000; Post, 2000) argue that both accents are *pitch* accents.
 12. We mention here only a few of the studies investigating factors on the presence of initial accents: *speaking rate* (e.g. Welby, 2006), *speaker idiosyncrasies* (Padeloup, 1990), *syntactic constituency* (Astésano, Bard, & Turk, 2007), *information structure* (German & D'Imperio, 2010), etc.
 13. Note that a function word can get an initial accent if disyllabic (e.g. Delais-Roussarie, 1995; Jun & Fougeron, 2002), or in cases of APs containing a long sequence of unstressed function words in a row (e.g. Delais-Roussarie, 1995; Dell, 1984; Mertens, 1987; Padeloup, 1990). Furthermore, the initial accent can be located on a function word depending on the *category* this belongs to (i.e. negation adverbs, demonstrative, tonic and relative pronouns can get accented, Delais-Roussarie, 1995, 1999; Mertens, 1993, among others) and its *phrase-internal position* (i.e. proclitics are never realized with an initial accent but enclitics can be pitch accented, e.g. Delais-Roussarie, 1999; Mertens, 1993).
 14. Also called "accent of focalization" (Rossi, 1993), "emphatic accent" (Dahan & Bernard, 1996), "emphatic initial accent" (*accent initiale emphatique*, cf. Di Cristo, 1999, 2000), etc.
 15. In a different approach by Féry (2001), phrasing is regarded as the primary strategy for marking focus in French: the narrowly focused constituent tends to be phrased on its own; otherwise syntactic phrases and accentual phrases typically coincide. Because the author regards initial and final accents as edge tones (and not as pitch accents), this account excludes the possibility of a direct projection of different information structures (broad vs. narrow focus) on the *tonal* realizations of the APs.
 16. Initial and late elbows were identified semi-automatically and hand-corrected by using the procedure described in Welby (2006, p. 351).
 17. Since a binomial logistic regression model cannot be calculated if there are no instances in a given condition, we replaced one instance without initial rise on the FW with a "Yes" in the NVF condition (Braun & Chen, 2010, footnote 3). The factor *speaker* could not be added as a fixed factor because of too few data points. However, if the presence of initial accent were due to speaker preferences, we would not see a main effect of condition.
 18. Following Nolan (2003), the semitone difference was calculated as $12(\log_2 H1 - \log_2 H2)$.
 19. A linear mixed effect model (Baayen, 2008) with *semitone difference* as dependent variable, *number of syllables* as predictor, and *speaker* and *item* added as crossed random factors revealed no effect of *number of syllables* on the *semitone difference* ($p = 0.9$).
 20. A further tonal pattern, implemented by Welby (2006) in Jun and Fougeron's model, is the L2H* (i.e. [LHi]LH*). This is realized as a rise from the late L (here indicated as L2) to the late H. Welby (2006) uses the L2 notation to distinguish the L2H* accent pattern from the LH* accent pattern (i.e. a rise from the initial L to the late H). In Table 5 the L2H* is not displayed in that we chose to illustrate only those tonal patterns that were realized on the accentual phrases investigated here.

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Appendix: German and French elicited utterances in the experimental setting of the polarity-switch dialogue

Table A1. German materials including information on the number of syllables of the non-finite verb. In the stimuli, non-finite verbs are printed in bold (and underlined in the equivalent English translation). Glosses are provided for the first utterance only.

Non-finite verb syllable number	Elicited utterances
2	<i>Auf meinem Bild hat die Frau die Blume gepflückt</i> In my picture has the-F.SG lady-F.SG the-F.SG flower-F.SG <u>picked</u> "In my picture the lady <u>picked</u> the flower"
3	<i>Auf meinem Bild hat der Junge den Reifen zerstochen</i> "In my picture the boy <u>punched</u> the tyre"
2	<i>Auf meinem Bild hat der Waldarbeiter den Baum gefällt</i> "In my picture the lumberjack <u>knocked down</u> the tree"
3	<i>Auf meinem Bild hat das Kind die Bonbons gegessen</i> "In my picture the child <u>ate</u> the candies"
3	<i>Auf meinem Bild hat der Fleischer das Fleisch geschnitten</i> "In my picture the butcher <u>cut</u> the meat"
3	<i>Auf meinem Bild hat der Herr die Krawatte geknotet</i> "In my picture the man <u>knotted</u> the tie"
4	<i>Auf meinem Bild hat der Einbrecher die Tür aufgebrochen</i> "In my picture the burglar <u>knocked</u> the door open"
3	<i>Auf meinem Bild hat der Jaguar die Schwalbe gebissen</i> "In my picture the jaguar <u>bit</u> the swallow"
3	<i>Auf meinem Bild hat das Mädchen den Geldschein zerrissen</i> "In my picture the girl <u>tore</u> the banknote"
3	<i>Auf meinem Bild hat der Obdachlose das Bier getrunken</i> "In my picture the homeless <u>drank</u> the beer"
3	<i>Auf meinem Bild hat der Herr die Sektflasche geöffnet</i> "In my picture the gentleman <u>opened</u> the champagne bottle"
2	<i>Auf meinem Bild hat der Straßenkehrer den Gehsteig gefegt</i> "In my picture the street sweeper <u>cleaned</u> the sidewalk"

Table A2. French materials, including information on the number of syllables of the non-finite verb. In the stimuli, non-finite verbs are printed in bold (and underlined in the equivalent English translation). Glosses are provided for the first utterance only.

Non-finite verb syllable number	Elicited utterances
2	<p><i>sur mon image la dame a cueilli la tulipe</i> In my picture the-F.SG lady-F.SG has <u>picked</u> the-F.SG tulip-F.SG “In my picture the lady <u>picked</u> the tulip”</p>
2	<p><i>sur mon image le garçon a crevé le ballon</i> “In my picture the boy <u>punched</u> the balloon”</p>
3	<p><i>sur mon image le gorille a avalé la bague</i> “In my picture the gorilla <u>swallowed</u> the ring”</p>
2	<p><i>sur mon image l'enfant a mangé les bonbons</i> “In my picture the child <u>ate</u> the candies”</p>
2	<p><i>sur mon image le renard a vidé le sac-à-dos</i> “In my picture the duck <u>emptied</u> the rucksack”</p>
3	<p><i>sur mon image l'enfant a déchiré le billet</i> “In my picture the child <u>tore</u> the banknote”</p>
3	<p><i>sur mon image le jaguar a attrapé l'hirondelle</i> “In my picture the jaguar <u>caught</u> the swallow”</p>
3	<p><i>sur mon image le gardien a arrêté le ballon</i> “In my picture the goalkeeper <u>fended off</u> the ball”</p>
3	<p><i>sur mon image le bûcheron a abattu l'arbre</i> “In my picture the lumberjack <u>knocked down</u> the tree”</p>
3	<p><i>sur mon image l'éléphant a défoncé le parquet</i> “In my picture the elephant <u>destroyed</u> the floor”</p>
3	<p><i>sur mon image l'oiseau a réveillé le policier</i> “In my picture the bird <u>woke up</u> the policeman”</p>
3	<p><i>sur mon image le balayeur a nettoyé le trottoir</i> “In my picture the street sweeper <u>cleaned</u> the sidewalk”</p>