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Focus and negation in Italian and German *why*-questions

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In the present study, we investigate whether negation interacts with the set of alternatives that are elicited by *why*-questions. More precisely, we examine whether negation modifies the so-called contrast-class (set of alternatives) in the same way as negation interacts with other constructions, such as focal elements in declarative sentences. To this end, we conducted a multiple forced-choice experiment on Italian and German *why*-questions in which we examined this interaction in broad and narrow focus conditions in the presence and absence of negation. The results indicate that in both languages, the presence of a narrow focus changes the set of alternatives of a *why*-question in comparison to a broad focus interpretation, even in the presence of negation. These findings show that focus guides the creation of alternatives. They further imply that the effect of negation on the set of alternatives is pragmatic because negation does not modify the truth-conditional value of the alternatives and it remains the same in the presence or absence of the narrow focus. The addition of negation turns a set of false contrasting propositions into a set of true contrasting propositions.

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1 Introduction

Why-questions are interrogative clauses that inquire about reasons, causes, and purposes. In comparison to other *wh*-questions, they display certain peculiarities from a syntactic, semantic, and prosodic perspective and some of them can be observed in several languages (Bromberger 1992; Stepanov & Tsai 2008; Shlonsky & Soare 2011; Soare 2021). For instance, some languages, which require obligatory subject-verb inversion in *wh*-questions, show pre- and postverbal subjects in *why*-questions, as it is the case in Italian, Basque, and a few Germanic vernacular varieties (Rizzi 2001; Walkden 2017: 57; Irurtzun 2021). Bianchi et al. (2018a) show that subject positioning in Italian depends on the information structural interpretation of the subject. More specifically, if the subject carries focus, i.e., the presence of relevant alternatives for the interpretation of the expression (Rooth 1992; Krifka 2008), it usually occurs in postverbal position, while it is interpreted as non-focal in preverbal position. By contrast, in verb-second languages, such as German, *why*-questions do not syntactically differ from other *wh*-questions as in Italian or in other Romance languages. In particular, as far as word order is concerned, the verb occurs usually obligatorily in the second position and preverbal subjects are generally excluded regardless of their information structural interpretation. In German *why*-questions, focus is marked by means of prosody. Despite the syntactic differences between Italian and German *why*-questions their semantics seem to overlap. In this paper, we build on the syntactic differences between the two languages in order to investigate how focus and negation interact in Italian and German *why*-questions. So far, this interaction has received attention in the context of declarative sentences. In these sentences, negation modifies the salient alternatives by interacting with the scope of focus. Depending on where the focus falls and how focus and negation interact, a different reading is available.

To the best of our knowledge, there is no research on the questions of how negation affects the creation of alternatives in *why*-questions, especially when focus and negation interact. This interaction provides interesting new insights into the special behavior of *why*-questions in Italian and German as well as the syntax-semantics interface more generally. Before we examine the interplay of focus and negation in Italian and German *why*-questions, we will present the syntactic, prosodic, and semantic peculiarities of Italian *why*-questions in more detail. Additionally, we will discuss how focus and negation may interact in these questions, based on previous studies on declarative sentences (see Section 2). In Sections 3 and 4, we present an experimental study which aims to investigate this interaction in Italian and German *why*-questions, respectively. We discuss the results in Section 5, before drawing some conclusions in Section 6.

2 Background

2.1 The special status of *why*-questions (in Italian and German)

In the last decades, several studies showed a variety of particularities of *why*-questions compared to other *wh*-questions (e.g., Rizzi 2001; Soare 2021). These particularities concern various domains. In this section, we report the main properties of Italian and German *why*-questions as

well as differences from other *wh*-questions from a syntactic, prosodic, and semantic perspective. Crucially, these differences are not restricted to Italian or German and are also found in other Romance and Germanic languages. Some of them occur even cross-linguistically (Torrego 1984; Stepanov & Tsai 2008; Irurtzun 2021).

2.1.1 A syntactic perspective

Rizzi (2001) points out some systematic syntactic differences between *why*-questions and other *wh*-questions in Italian. A first difference concerns the compatibility with focus fronting. The examples in (1a) to (1d) (Rizzi 2001: 290–92) show that *wh*-operators are incompatible with a fronted focus in direct questions both when the latter follows the *wh*-operator (1a), (1c) and when it precedes it (1b), (1d). By contrast, the *wh*-operator *perché* ‘why’ (and also *come mai* ‘how come’) differs from other *wh*-operators since it is compatible with a following fronted focus constituent (1a’) and (1c’), but this fronted focus cannot precede *why* (1b’) and (1d’).

- (1) a. *A chi [questo]_{focus} hanno detto (non qualcos’altro)?
to whom THIS have-3PL said (not something else)
‘To whom have you said THIS and not something else?’
- a’. Perché [questo]_{focus} hanno detto (non qualcos’altro)?
why THIS have-3PL said (not something else)
‘Why have they said THIS and not something else?’
- b. *[Questo]_{focus} a chi hanno detto (non qualcos’altro)?
THIS to whom have-3PL said (not something else)
‘To whom have you said THIS and not something else?’
- b’. *[Questo]_{focus} perché hanno detto (non qualcos’altro)?
THIS why have-3PL said (not something else)
‘Why have they said THIS and not something else?’
- c. *Che cosa [a Gianni]_{focus} hanno detto (non a Piero)?
what thing TO GIANNI have-3PL said (not to Piero)
‘What have they said to GIANNI and not to Piero?’
- c’. Perché [a Gianni]_{focus} hanno detto questo (non a Piero)?
why TO GIANNI have-3PL said this (not to Piero)
‘Why have they said this to GIANNI and not to Piero?’
- d. *[A Gianni]_{focus} che cosa hanno detto (non a Piero)?
TO GIANNI what thing have-3PL said (not to Piero)
‘What have they said to GIANNI and not to Piero?’
- d’. *[A Gianni]_{focus} perché hanno detto questo (non a Piero)?
TO GIANNI why have-3PL said this (not to Piero)
‘Why have they said this to GIANNI and not to Piero?’

A second difference between Italian *why*-questions and questions with other *wh*-elements is related to subject positioning. The latter requires subject-verb inversion and the subject occurs postverbally and cannot occur in preverbal position, as shown in (2):

- (2) a. *Che cosa **Gianni** ha fatto?
 what thing Gianni has done
 b. Che cosa ha fatto **Gianni**?
 what thing has done Gianni
 ‘What has Gianni done?’

Again, direct *why*-questions are more permissive and are compatible with both pre- and postverbal subjects (Bianchi et al. 2018a):

- (3) a. Perché **Gianni** è venuto?
 why Gianni is come
 b. Perché è venuto **Gianni**?
 why is come Gianni
 ‘Why has Gianni come?’

Bianchi et al. (2018a) show that the distribution of subjects in *why*-questions is sensitive to information structure, that is, preverbal subjects are related to a [-Focus]-interpretation, while postverbal subjects receive a narrow focus reading (see also Schmid et al. 2021; Krieger 2024). This is in line with Belletti (2004) who assumes that the inverted focal subject targets a dedicated focus projection in the periphery of the vP.

Based on these two differences, Rizzi (2001) argues that *perché* does not move from a position within TP to the CP domain. Instead, *why* is rather externally merged in the left periphery contrary to other *wh*-operators. More specifically, *why* occupies the Specifier of the Interrogative Head (henceforth Spec,IntP), a position otherwise filled by the interrogative complementizer *se* ‘if’ introducing embedded polar questions.¹ Other *wh*-operators, by contrast, move from a lower position, in which they are originally merged, to CP requiring a I-to-C movement (Rizzi 2001). The position where *wh*-elements move to is the specifier of the Focus Phrase (henceforth Spec,FocP), and this is the reason why they cannot co-occur with a fronted focus. This assumption is in line with Bianchi et al. (2018b) who suggest that the *why*-operator is externally merged directly in the left periphery because it applies to a complete proposition.

¹ It is worth mentioning an alternative analysis proposed by Shlonsky & Soare (2011), who argue that the *why*-operator moves from a lower position (Reason Phrase), probably still in the CP field, to the higher IntP proposed by Rizzi. This proposal is also compatible with the analysis that we will propose below. In the rest of the paper, we remain agnostic about the external merge position of the *why*-operator.

Further evidence for a special syntactic position of *why* comes from Cognola & Cruschina (2021) and Krieger (2024) who show that the discourse particle *poi* ‘then’ as well as vocatives can intervene between *why* and the verb. By contrast, these elements are excluded in other *wh*-questions:

- (4) a. *Ma a lei chi **poi** la rappresenta?
 but to her who PART her represents
 ‘Who represents her then?’
 b. E perché **poi** valgono le ragioni dei lavoratori [...]?
 and why PART hold the reasons of-the workers
 ‘And why are only the reasons of the workers of the power station considered [...]?’
 (Cognola & Cruschina 2021: 100–102)

- (5) a. *Cosa, **Natalia**, hai evidenziato nel testo?
 what Natalia-VOC have-2SG marked in-the text
 ‘What have you marked in the text, Natalia?’
 b. Perché, **Natalia**, hai evidenziato questo paragrafo?
 why Natalia-VOC have-2SG marked this paragraph
 ‘Why have you marked this paragraph, Natalia?’
 (Krieger 2024: 109)

In German, *why*-questions behave more similarly to other *wh*-questions from a syntactic point of view compared to their Italian counterparts. This is shown in (6) and (7) where in contrast to Italian, preverbal subjects (6) as well as fronted foci (7) are ruled out in German *wh*- and *why*-questions:

- (6) a. *Was **Johannes** machte?
 what Johannes did
 b. Was machte **Johannes**?
 what did Johannes
 ‘Was machte Johannes?’
 c. *Warum **Johannes** kam?
 why Johannes came
 d. Warum kam **Johannes**?
 why came Johannes
 ‘Warum kam Johannes?’
- (7) a. *Wem **[DAS]**_{focus} haben sie erzählt (und nicht etwas anderes)?
 to whom this have she said (and not something else)
 ‘To whom did they say THIS and not something else?’

- b. *Warum [**DAS**]_{focus} haben sie erzählt (und nicht etwas anderes)?
 why this have she said (and not something else)
 ‘Why did they say THIS and not something else?’

One possibility to account for this difference is discussed by Catasso (2021) who assumes that the German *warum*-operator is moved from the middle field to the CP, unlike the Italian *perché*-operator which is generated in the CP (Rizzi 2001). Catasso’s (2021) hypothesis is based on observations of the co-occurrence of German *warum* and modal particles as well as aggressive intensifiers which are generally assumed to be base-generated in the middle field. However, this assumption is problematic from a semantic perspective as *why* takes scope over the whole proposition (Bromberger 1992; Bianchi et al. 2018a) (for further details on the semantics of *why*-questions, see 2.1.3). Therefore, it seems more plausible to assume that *why* is merged in the left periphery in German. Further empirical evidence for an external merge position for German *warum* comes from observations in some Germanic varieties. In these varieties, preverbal subjects are attested in *wh*-questions, but only in those with the *wh*-phrase *why*, as shown in (8a) for Old High German (Walkden 2014: 119) and (8b) for Urban Vernacular German (‘Kiezdeutsch’) (Walkden 2017: 57):

- (8) a. fader alomahchtig ... te huí **tau** mim sô farlieti...?
 father almighty ... to what.INS you me so forsook
 ‘Almighty Father, why have you forsaken me?’
- b. warum **du** machst DINGS
 why you do thing
 ‘Why are you doing that?’

In sum, previous studies have shown that word order in Italian *why*-questions is restricted differently than in most other bare *wh*-questions (Rizzi 2001), while German *why*- and *wh*-questions behave mostly alike in this respect. Despite these differences, we assume an external merge position for *why* in both Italian and German.

2.1.2 A prosodic perspective

Italian *why*-questions are different from other *wh*-questions not only syntactically, but also from a prosodic perspective (Bocci & Bianchi & Cruschina 2021; Bocci & Cruschina & Rizzi 2021). Bocci & Cruschina & Rizzi (2021) showed this for the assignment of main prominence,² i.e., stress and the nuclear pitch accent (henceforth, NPA). The main prominence usually falls on *perché* (i.e., the *why*-operator) itself in Italian *why*-question, and not on the verb given the absence of focus fronting. The authors take this prosodic asymmetry to be directly linked to the different syntactic

² In Italian, the main prominence is by default assigned to the rightmost constituent (Nespor & Vogel 1986; Zubizarreta 1998). However, in direct *wh*-questions, the NPA is systematically assigned to a lexical verb.

derivation of *why*, which, “unlike other *wh*-elements, does not undergo cyclic movement from a clause internal position, but is externally merged in a left-peripheral dedicated position” (Bocci & Cruschina & Rizzi 2021: 294). A different pattern emerges in Italian *wh*-questions with bare *wh*-phrases other than *perché* and *come mai* (‘how come’) where the NPA is assigned to the lexical verb and not to the *wh*-element itself, as shown by Bocci & Bianchi & Cruschina (2021).

As far as German prosody is concerned, *wh*-questions show a broad range of different intonational contours. The most frequent ones are L + H* L-% and L + H* L-H%. In these questions, the NPA is usually associated with the object or the verb (Braun et al. 2019). As far as we know, there is no work that addresses the question of whether there are prosodic differences between *why*-questions and other *wh*-questions in German.

2.1.3 A semantic perspective

Why-questions differ from other *wh*-questions not only in their syntax and prosody but also in their semantics. An account to formalize *why*-questions is provided by van Fraassen (1980), who defines the *why*-question-answer pair in a context as follows:

- (9) B is a direct answer to question $Q = \langle P_k, X, R \rangle$ iff there is some proposition A such that A bears relation R to $\langle P_k, X \rangle$ and B is the proposition which is true iff $(P_k ;$ and for all $i \neq k, \text{ not } P_i ;$ and A) is true (van Fraassen 1980: 144).

A *why*-question is therefore a triple $\langle P_k, X, R \rangle$, where P_k is the *topic of the question*, X, a set $\{P_1, \dots, P_k, \dots\}$ of propositions, namely a *contrast-class*, and R is a *relevance relation*. Given a question $Q = \langle P_k, X, R \rangle$, a proposition A is considered relevant to Q if and only if A bears the relevance relation R to the couple (P_k, X) . Therefore, an answer to such a *why*-question takes the form:

- (10) B: P_k in contrast to (the rest of) X because of A.³

A proposition B qualifies as a *direct answer* to such a question if and only if there is some proposition A such that A bears relation R to (P_k, X) and B is the proposition which is true exactly if and only if $(P_k ;$ and for all $i \neq k \text{ not } P_i ;$ and A) is true.⁴ The example in (11) illustrates these basic notions (adapted from Beltrame 2018):

- (11) Why did John go to the cinema?
 a. **the topic: P_k :** “John went to the cinema”
 b. **the contrast-class X:** {“John went to the theatre”, “John went to the park”, “John went to the cinema”}

³ The answer B claims that P_k is true and that all the other members of the contrast-class are false. Additionally, B states that A is true and B claims with the word *because* that A is a reason. Following van Fraassen, the word *because* signals that A is relevant for this question in this context. Therefore, A bears relation R to $\langle P_k, X \rangle$ (van Fraassen 1980: 143).

⁴ Notice that van Fraassen (1980: 145) calls A the *core* of answer B.

- c. **relevance relation R:** {"a new movie of his favorite actor is out", (P_k, X)), ...}
- d. **the direct answer:** (P_k; and for all i ≠ k not P_i; and A)
- e. **the core of the answer A:** "a new movie of his favorite actor is out"
- f. **the answer B:** *Because a new movie of his favorite actor is out*

Beltrame (2018) and Beltrame & Chesi (2021) adopt the contrast-class idea in conjunction with the notion of focus, following Rooth (1992). Rooth's (1992) focus theory predicts that contextual factors play an essential role in selecting a set of mutually exclusive alternatives. Following this approach, a contrastive use of a focus phrase evokes a set of alternatives, which is "in some cases a pragmatically constructed object" (Rooth 1992: 86). Rooth (1992) accounts for focus by adding a semantic value, namely the focus semantic value for a sentence S, that is, the set of propositions obtainable from the ordinary semantic value by making a substitution in the position corresponding to the focus phrase. Following this proposal, it is plausible to interpret *why*-questions as follows (adapted from Beltrame & Chesi 2021):

- (12) Why did Adam eat [**the apple**]_{focus}?
 topic proposition = ordinary value = eat' (the apple') (Adam') (tense omitted)
 X = a contextually relevant subset of the focus semantic value:
 $X \subseteq \{\text{eat}'(x) \text{ (Adam')} \mid x \in D\}$ (with D the domain of entities, tense omitted)

(12) asks which relevant proposition P explains why Adam ate the apple instead of eating the pear, or the plum. In (13), a similar example is provided but the focus constituent is different:

- (13) Why did [**Adam**]_{focus} eat the apple?
 topic proposition = ordinary value = eat' (the apple') (Adam') (tense omitted)
 X = a contextually relevant subset of the focus semantic value:
 $X \subseteq \{\text{eat}'(\text{the apple}')(y) \mid y \in D\}$ (with D the domain of entities, tense omitted)

(13) asks which relevant proposition P explains why Adam ate the apple instead of Eddie or Flora. A comparison of the examples in (12) and (13) reveals the same linear order in both questions, but prosody diverges. Additionally, the two questions also differ with respect to pragmatics, that is, they ask for different information and are uttered in different contexts, even though the value of P_k is the same. Thus, the change of the focus value in (12) and (13) also provokes different answers to the questions. Example (12) can be answered by *because he forgot to buy the pear*, while example (13) requires an answer like *because Eddie and Flora already had breakfast*. Importantly, a shift of focus from one constituent to another does not trigger a different answer in other *wh*-questions (Dretske 1972: 419–20; Bromberger 1992; Stepanov & Tsai 2008):

- (14) a. When did [**Adam**]_{focus} eat the apple?
 b. When did Adam eat [**the apple**]_{focus}?
 c. Answer to a and b: On July 7 at 4 p.m. (Stepanov & Tsai 2008: 601)

2.2 Negation and its interaction with focus in Italian and German

In this section, we first provide a description of sentential negation in declarative sentences, before we report on previous studies of the interaction between focus and negation. Second, focus and negation are considered separately in Italian and German *why*-questions, providing some hypotheses for their interaction in this kind of questions.

Sentential negation can be expressed by *non* ‘not’ in Italian and *nicht* ‘not’ in German, see (15) and (16). Syntactically, it combines with an entire clause and semantically applies to a proposition, changing its truth value (Lasnik 1975):

- (15) a. Gianni ha lavorato.
Gianni has worked
‘Gianni worked.’
- b. Gianni non ha lavorato.
Gianni not has worked
‘Gianni did not work.’
- (16) a. Johannes hat gearbeitet.
Johannes has worked
‘Johannes worked.’
- b. Johannes hat nicht gearbeitet.
Johannes has not worked
‘Johannes did not work.’

According to Belletti (1990), there are at least two different positions for sentential negation: a higher one, the NegP, which is placed to the immediate left of the TP, and a lower one, probably in the low-TP/VP area. In Italian, *non* ‘not’ occupies the higher position above TP, while in modern German *nicht* ‘not’ occupies the lower position, as shown in (17).

- (17) a. CP > TP > NegP > VP . . . (German/Dutch)
b. CP > NegP > TP > VP (English/Romance)

(Catasso 2021: 136)

Concerning focus in declarative sentences, Krifka (2008) distinguishes between two different uses of focus: a semantic use of focus, and a pragmatic one. While the semantic use refers to factual information and has implications regarding the truth conditions of the sentence, the pragmatic use affects the communicative goals of the speaker without changing the truth conditions. In related studies (for a review, see Fălăuș 2020), there is ongoing discussion about the nature of the interaction between negation and the structures that generate alternatives, such as focus, questions, and presuppositions. In particular, it is debated whether this interaction is semantic or pragmatic. Variation of the presence or the absence of a narrow focus in the scope of negation

does not change the truth conditions of the proposition. Nevertheless, the set of alternatives might vary, suggesting that this interaction is pragmatic, as illustrated by the example provided in Büring (2016: 265) (see also Beaver & Clark 2009: 45 for a similar example):

- (18) a. Trane didn't mention your [**name**]_{focus} in court.
 b. Trane didn't mention [**your**]_{focus} name in court.

Although the truth value expressed by (18a) and (18b) does not change, the meaning implied by the two sentences is different. In fact, (18a) negates that the addressee's name was mentioned in court and implies that something else was mentioned, whereas (18b) negates that the addressee's name was mentioned in court and suggests that someone else's name was. In both (18a) and (18b), there is a positive polarity effect on the focal alternatives. Focus usually elicits a set of alternatives that are negated and in (18a) and (18b), these alternatives are positive. For the presence of focus in negated sentences, Al-Horais (2017) distinguishes between three different focus types in Arabic coming along with different syntactic structures: i) free focus (i.e., a narrow focus outside the scope of negation), ii) bound focus (i.e., a narrow focus in the scope of negation), and iii) wide focus (i.e., a sentential negation). These readings, which Al-Horais attributes to the scope of the negation, involve a different derivation, reflecting how focus interacts in a systematic way with syntax (compare (19) and (20)). Such an interaction can be adopted for Italian. The examples in (20) show the difference between wide focus (see (20a)) and bound focus (see (20b)) in Italian.

- (19) a. Gianni ha lavorato.
 Gianni has worked
 'Gianni worked.'
 b. Ha lavorato [**Gianni**]_{focus}.
 has worked Gianni
 'GIANNI worked'
- (20) a. Gianni **non** ha lavorato.
 Gianni not has worked
 'Gianni did not work.'
 b. **Non** ha lavorato [**Gianni**]_{focus}.
 not has worked Gianni
 'GIANNI did not work.'

In (20a), sentential negation is expressed (Al-Horais 2017). In this kind of sentences, the Neg-operator changes the truth value of the proposition. In (19b) and (20b), where a focal subject occurs in the scope of the negation (bound focus, Al-Horais 2017), the Neg-operator changes the

truth values of the proposition, but differently as in the previous example. It further implies that there is someone else instead of Gianni who worked. Interestingly, the alternatives elicited by the focus in (19b) are false or at least denied (i.e., *Mark did not work*), while the alternatives elicited by the focus in (20b) are true or at least not denied (i.e., *Mark did work*).

German is more rigid in reordering sentence arguments. Thus, such readings can only be conveyed through prosody and constituent negation (see (21) and (22)). In fact, German can use certain positions for *nicht* (e.g., immediately preceding the subject) for focus marking, as shown in (22). The operation in (22b), also called contrastive negation (Jacobs 1982; Jacobs 1991), leads to focus or topicalization on the target constituent (Bross 2023).

- (21) a. Johannes hat gearbeitet.
 Johannes has worked
 ‘Johannes worked.’
- b. [**JOHANNES**]_{focus} hat gearbeitet.
 Johannes has worked
 ‘JOHANNES worked.’
- (22) a. Johannes hat **nicht** gearbeitet.
 Johannes has not worked
 ‘Johannes did not work.’
- b. **Nicht** [**Johannes**]_{focus} hat gearbeitet, sondern Paul.
 not Johannes has worked instead Paul
 ‘It was not Johannes who worked, but Paul.’

In sum, Italian and German exhibit syntactic differences in the rearrangement of arguments and the position of negation. This also entails different linguistic strategies for signaling the presence of a focus. Starting from observations made in declarative sentences with respect to the truth value, focal alternatives, and their pragmatic interpretations, four different scenarios are considered: i) sentences that contain neither narrow focus nor negation (see (19a) and (21a)), ii) declaratives with narrow focus, as shown in (19b) and (21b), iii) declaratives with sentential negation (see (20a) and (22a)), and iv) sentences with narrow focus in the scope of negation, as illustrated in (20b) and (22b).

For *why*-questions the same four combinations with respect to the presence and absence of narrow focus and negation are considered. Recall, the contrast-class can be described as a set of alternative propositions generated by narrow focus in the scope of the *why*-operator (see section 2.1.3). The presence of narrow focus on the subject in Italian *why*-questions is expressed by means of word order and the appropriate prosodic contour, as shown in (12) and (13). However, it is more difficult to test the presence of a contrast-class when prosody and word order do not

signal narrow focus. In this case, the presence of a broad focus is assumed and the contrast-class is reduced to the polar set (i.e., {P; ¬P}, see Rooth (1992) for declarative sentences). For example, the contrast-class in the question (23) is the set of only two propositions (she eats; she does not eat).

- (23) A: Perché mangia?
 why eats
 ‘Why does she eat?’
 B: Perché ha saltato il pranzo.
 because has skipped the lunch
 ‘Because she skipped lunch.’

We also expect similar behavior of alternatives under the presence of negation. In this regard, Shlonsky and Soare (2011) noted that *why*-questions generally differ from other *wh*-questions since the *wh*-element blocks *wh*-movement as in (24b), while no such blocking is observed for *why* (24a). The ungrammaticality of a question like (24b) is explained by a relativized minimality violation induced by the intervention of negation (cf. Rizzi 1990):

- (24) a. Why didn’t Geraldine fix her bike?
 b. *How didn’t Geraldine fix her bike?

The same contrast between *why*-questions and other *wh*-questions can be observed in German (Catasso 2021) where *nicht* is assumed to be in a lower position than in English and Italian:

- (25) a. Warum hat Geraldine ihr Fahrrad nicht repariert?
 why has Geraldine her bike not repaired
 ‘Why didn’t Geraldine repair her bike?’
 b. *Wie hat Geraldine ihr Fahrrad nicht repariert?
 how has Geraldine her bike not repaired
 ‘How didn’t Geraldine repair her bike?’

From a semantic perspective, the question in (26) is similar to the question in (23), but with the addition of the Neg-operator *non* ‘not’ that takes scope over the Tense Phrase (TP) (Zanuttini 1991; Moscati 2010 on declaratives). The contrast class is the same, only the topic proposition changes: in (23) it is P, while in (26) the topic proposition is ¬P.

- (26) A: Perché **non** mangia?
 why not eats
 ‘Why does she not eat?’

- B: Perché ha mangiato troppo a pranzo.
 because has eaten too much at lunch
 ‘Because she ate too much at lunch.’

In sum, previous studies on declarative sentences have shown that under the presence of negation, the truth conditions change, whereas for focus in the scope of negation, the set of alternatives might be different. However, the interaction of focus and negation has so far not been studied for *why*-questions. Accordingly, the goal of this paper is twofold. First, we aim at deepening our knowledge about the particularities of Italian and German *why*-questions at the syntax-semantics interface. Second, we want to contribute to a better understanding of the interaction of focus and negation more generally, asking the following research question:

RQ: How do focus and negation interact in Italian and German *why*-questions?

Given the observations from previous studies on focus and negation in *why*-questions as well as on their interaction in declarative sentences, we expect that the interaction between negation and focal alternatives is the same at the semantic level, not least because *why*-questions create alternatives at the propositional level. However, from a pragmatic perspective, the contrast-class may differ in (27a) and (27b), as well as in (28a) and (28b), respectively, and the two questions might be felicitous in different contexts. In other words, the topic proposition is the same in the two questions in (27) and (28), but the set of alternatives is different. In both questions, we expect alternatives with positive polarity but (27a) and (28a) are built on broad focus alternatives (i.e., Johannes worked), while the set of propositions elicited by (27b) and (28b) is built on the DP (i.e., DAVID has worked). This suggests an interaction between negation and alternatives in *why*-questions similar to the one suggested by Büring in example (18) for declarative sentences.

- (27) a. Perché Gianni **non** ha lavorato?
 why Gianni not has worked
 ‘Why has Gianni not worked?’
 b. Perché **non** ha lavorato [**Gianni**]_{focus}?
 why not has worked Gianni
 ‘Why has GIANNI not worked?’
- (28) a. Warum hat Johannes **nicht** gearbeitet?
 why has Johannes not worked
 ‘Why has Johannes not worked?’
 b. Warum hat nicht [**Johannes**]_{focus} gearbeitet?
 why has not Johannes worked
 ‘Why has JOHANNES not worked?’

3 Study on Italian

In order to examine how focus and negation interact in Italian and German *why*-questions, we conducted a web-based experiment in Italian and German using a multiple forced-choice task.

3.1. Material

The experiment used 2x2 Latin square design and consisted of 24 items, resulting in four conditions and 96 experimental stimuli (*why*-questions). The two independent variables were *focus type* and *negation*. For *focus type*, we selected two levels: broad focus on the entire sentence and narrow focus on the subject. The respective focus types were elicited in two ways. First, we used word order to differentiate between broad focus and narrow focus. The word order pattern subject-verb (SV) is correlated with a broad focus interpretation, whereas verb-subject (VS) corresponds to a narrow focus reading on the subject, as shown in **Table 1**. Second, we employed intonation to underline the respective focus types and recorded the sentences, based on the results of Bocci & Cruschina & Rizzi (2021). Accordingly, in *why*-questions with a broad focus reading, *perché* ‘why’ bears a high pitch accent (H*) and the boundary tone is high (H%). By contrast, in *why*-questions with narrow focus on the subject, the pitch falls on the subject and is realized with a rising contour (L + H*) regardless of the presence of negation (Bocci 2013). Intonation is also important to exclude the possibility of participants building the set of alternatives on the VP in *why*-questions with preverbal subjects. For the independent variable *negation*, we differentiated between two levels [-Negation] and [+Negation], only focusing on the negation-operator *non* ‘not’, as shown in **Table 1**. Both factors were manipulated within items and within participants. A list of all items can be found in the supplementary materials M1.⁵

The dependent variable was the choice between four options that represented a potential continuation of the *why*-question which were added by a coordination construction with Italian *e* ‘and’. The four options differed regarding the constituent on which the set of alternatives was built. For the first and the second options (i) and ii) in **Table 1**, the set of alternatives was built on the TP level because the option represents an alternative to the whole TP within the *why*-question. For instance, the TP *e non ha riposato* ‘and did not rest’ in i) corresponds to an alternative of *l’impiegato ha lavorato* ‘the employee worked’ in the *why*-question. The *why*-questions in i) and ii) differ only with respect to the presence of the negation operator *non* ‘not’. For the third and the fourth option (iii) and iv) in **Table 1**, the set of alternatives is built on the subject DP and represents an alternative to the subject in the *why*-question. For example, *il*

⁵ The supplementary materials are openly available at the following Open Science Framework repository: https://osf.io/5nb7t/?view_only=b76f9f343db5461bb8ead0289d1daa91.

tirocinante ‘the intern’ in iii) and iv) is an alternative to *l’impiegato* ‘the employee’ in the *why*-question. Again, the sentences in iii) and iv) vary regarding the presence of negation.

	[-Negation]	[+ Negation]
broad focus	Perché <i>l’impiegato</i> ha lavorato ___? ‘Why did the employee work___?’	Perché <i>l’impiegato non</i> ha lavorato ___? ‘Why didn’t the employee work___?’
	i) e non ha riposato (and did not rest), ‘not TP’ ii) e ha riposato (and rested), ‘TP’ iii) e non il tirocinante (and not the intern), ‘not DP’ iv) e il tirocinante sì (and the intern did), ‘DP’	i) e non ha riposato (and did not rest), ‘not TP’ ii) e ha riposato (and rested), ‘TP’ iii) e non il tirocinante (and not the intern), ‘not DP’ iv) e il tirocinante sì (and the intern did), ‘DP’
narrow focus on the subject	Perché ha lavorato <i>l’impiegato</i> ___? ‘Why did THE EMPLOYEE work_?’	Perché <i>non</i> ha lavorato <i>l’impiegato</i> ___? ‘Why didn’t THE EMPLOYEE work_?’
	i) e non ha riposato (and did not rest), ‘not TP’ ii) e ha riposato (and rested), ‘TP’ iii) e non il tirocinante (and not the intern), ‘not DP’ iv) e il tirocinante sì (and the intern did), ‘DP’	i) e non ha riposato (and did not rest), ‘not TP’ ii) e ha riposato (and rested), ‘TP’ iii) e non il tirocinante (and not the intern), ‘not DP’ iv) e il tirocinante sì (and the intern did), ‘DP’

Table 1: Example of an Italian item.

To keep constant as many other factors as possible, we only included unergative verbs and animate common nouns for the subject with a definite article.

Additionally, we created 32 filler sentences, including 12 polar questions (six with and six without negation) as well as 20 *wh*-questions with other *wh*-elements that require obligatory subject-verb inversion, including *chi* ‘who’, *cosa* ‘what’, *dove* ‘where’, *quando* ‘when’, and *come* ‘how’ (ten with and ten without negation). We also provided four options as a possible continuation of these questions. These continuations were built in line with the experimental stimuli and either presented alternatives to the DP or to the TP. However, in contrast to the experimental stimuli, the options for the fillers were coordinated by Italian *o* ‘or’. The following examples present a polar question with negation (29) and a *wh*-question without negation (30):

- (29) Il portatile, non l’ha portato a scuola ___?
The laptop not it-has brought to school

- i) o a casa
or at home
 - ii) o lo zaino
or the bag
 - iii) o non l'ha proprio comprato
or not it-has even bought
 - iv) o l'ha proprio comprato
or it-has even bought
- (30) Cosa ha dimenticato a casa Giuseppe, la penna ___?
what has forgot at home Giuseppe, the pen
- i) o la matita
or the pencil
 - ii) o a scuola
or at school
 - iii) o non ha portato niente
or not has brought nothing
 - iv) o ha portato tutto
or has brought everything

3.2 Participants & Procedure

44 Italian native speakers took part in the experiment. The participants (mean age = 34.3, range = 18–71, 28 female, 16 male) were recruited in different Italian regions. 29 participants reported speaking a Northern, eight a Central, and seven a Southern Italian variety. They all participated all on a voluntary basis. We did not inform them about the purpose of the study.

Before the data analysis, we checked participants' choice of the 20 *wh*-questions (fillers) which only allowed for one of the four options. If participants' choice deviated in more than four fillers from the expected choice, they were excluded from the final analysis. Based on this criterion, none of the participants had to be eliminated.

The experiment was set up on the online platform offered by the IUSS Pavia, using JSPsych libraries (De Leeuw 2015). At the beginning of the study, participants completed a background questionnaire and completed the consent form. Afterwards, they were asked to select one of the four coordination options that sounded most natural to them. After this short introduction, the participants completed two practice items. One of the practice items was constructed identically to the test stimuli, the other one was identical to the fillers, as in (29). The main part of the task contained the experimental stimuli which were presented in a pseudo-randomized order combined with the filler sentences. The first part of the test and filler sentences were only presented orally

to ensure that participants considered word order and intonation for their choice, while the four continuation options were presented in a written form. Participants could listen twice to the recording.⁶ The total duration of the experiment was around 20 minutes.

3.3 Statistical analysis

In our experiment, we elicited unordered categorical data (choice, one out of four options) that we analyzed with a multinomial logistic regression model in R, using the package *polynomous*, as proposed by Han et al. (2013) and Levshina (2015). We defined choice as the dependent variable which consisted of four categorical continuation options. The main independent variables of interest were focus type (broad focus vs. narrow focus on the subject) and negation ([–Negation]) vs. ([+Negation]). To address potential variance in the data, we further considered participant and item⁷ as independent variables. For an overview of the model specification including interaction terms and fixed effects as well as the results for the main variables of interest, see supplementary materials M2.

3.4 Results

The results of our task are summarized in **Figure 1** which plots the percentage of selected options for non-negated and negated *why*-questions under broad focus and narrow focus on the subject. The results indicate that option ‘not TP’ was highly preferred in non-negated *why*-questions under a broad focus interpretation (see the top left part of the figure). In this context, ‘not DP’ was also chosen by participants to a low extent, while the percentage of options ‘TP’ and ‘DP’ was close to zero. For negated *why*-questions with a broad focus reading, participants favored the ‘DP’ option for which the percentage was only slightly higher than for the ‘TP’ option. A closer look at the individual level revealed that around 52% of participants chose both options ‘TP’ and ‘DP’ to a similar degree, while 21% showed a clear preference for ‘TP’ and 27% for ‘DP’. The option ‘not TP’ was selected around 10% of the time, whereas no one selected the option ‘not DP’ in this context (see top right part of the figure). For non-negated *why*-questions with a narrow focus interpretation of the subject, participants clearly preferred the option ‘not DP’, followed by ‘not TP’ which was chosen around 15% of the time. For both options, ‘TP’ and ‘DP’, the rate of selection was close to zero (see bottom left in the figure). For negated *why*-questions under a narrow focus reading on the subject, the ‘DP’ option was highly favored over the other options.

⁶ A female native speaker of Italian was recorded the stimuli in a sound attenuated booth at the University of Konstanz. She was asked to produce the sentences, taking care of the nuclear contours for each condition. The whole sentences were recorded (i.e., the question with the continuation) in order to get more natural recordings. Recordings were checked, cut and prepared afterwards in Praat (Boersma & Weenink 2015).

⁷ Note that we had to exclude the results for item 1 due to a coding error, but the results did not change with this exclusion.

Participants selected the ‘TP’ option around 20% of the time, while both ‘not TP’ and ‘not DP’ were chosen less than 10% of the time (see bottom right in the figure). In sum, the results suggest a clear pattern of preference for the option ‘not TP’ and ‘not DP’ in the case of non-negated *why*-questions, whereas the opposite pattern is found in negated *why*-questions in which the options ‘TP’ and ‘DP’ received a higher percentage.

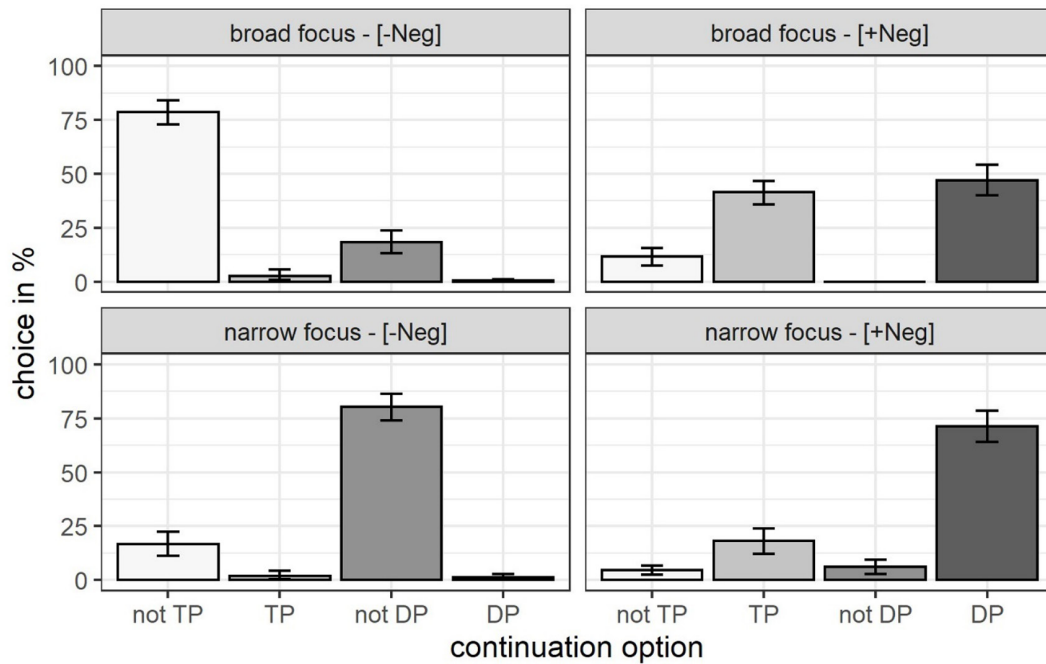


Figure 1: Percentage of selected options for *why*-questions across the negation and focus type conditions in Italian.

We ran a multinomial logistic regression model to test how focus type and negation modify the set of alternatives in Italian matrix *why*-questions. The statistical results are summarized in **Table 2**. Note that the results reported for this model always compare one option against all other three options. For the sake of simplicity, we do not repeat this below for each comparison.

The findings revealed that the ‘not TP’ option was chosen significantly less often under a narrow focus reading for both non-negated ($-3.184, p < 0.001$) and negated *why*-questions ($-1.091, p < 0.01$). The likelihood for the selection of ‘not TP’ was smaller under the presence of negation with a broad focus interpretation ($-3.639, p < 0.001$) and narrow focus reading ($-1.546, p < 0.01$).

The chance that participants selected the ‘TP’ option increased significantly under [+Neg] for both a broad ($3.485, p < 0.001$) and a narrow focus interpretation ($2.487, p < 0.001$) in comparison to [-Neg]. A comparison of both focus types shows that the chance for the ‘TP’

option decreases for the narrow focus interpretation under [+Neg] ($-1.331, p < 0.001$), while it does not differ significantly under [-Neg] ($-0.3337, p = 0.576$).

The results show that the ‘not DP’ option was selected more often under a narrow focus interpretation in *why*-questions without negation than under broad focus ($3.268, p < 0.001$). An effect of focus type was not observed in negated *why*-questions ($16.73, p = 0.979$). For *why*-questions with a broad focus interpretation, negation does not have an effect on the choice of the option ‘not DP’ ($-18.06, p = 0.978$), while *why*-questions with a narrow focus reading reveal a lower chance for option ‘not DP’ under negation ($-4.599, p > 0.001$).

The ‘DP’ option was chosen more often in negated *why*-questions under both focus types (broad focus: $5.751, p < 0.001$; narrow focus: $5.891, p < 0.001$). Focus type only affected the choice of ‘DP’ option in negated *why*-questions. In negated *why*-questions, the ‘DP’ option was selected more often under narrow focus than under broad focus ($1.235, p < 0.001$), whereas there was no effect of focus type in *why*-questions without negation ($1.096, p = 0.345$).

In sum, the results show that the chance of selecting ‘not TP’ was driven by both factors, focus type and negation. By contrast, the chances for the other three options were mainly driven by only one factor. For the option ‘not DP’, focus type was the driving factor, whereas negation was the driving factor for the options ‘TP’ and ‘DP’.

	‘not TP’ option	‘TP’ option	‘not DP’ option	‘DP’ option
Focus type	generally lower chance in narrow focus **(*)	[-Neg]: n.s. [+Neg]: lower chance in narrow focus ***	[-Neg]: higher chance in narrow focus *** [+Neg]: n.s.	[-Neg]: n.s. [+Neg]: higher chance in narrow focus ***
Negation	generally lower chance in [+Neg] ***	generally higher chance in [+Neg] ***	[broad focus]: n.s. [narrow focus]: lower chance in [+Neg] ***	generally higher chance in [+Neg] ***
Nagelkerke’s R squared of the model: 0.79				

Table 2: Summary of statistical effects of focus type and negation on the probability of selecting ‘not TP’, ‘TP’, ‘not DP’, and ‘DP’.

*** $p < .001$, ** $p < .01$, * $p < .05$, n.s. $p > .05$.

4 Study on German

4.1. Material

The materials for the German task were constructed in line with the Italian experiment, that is, 24 items were used with 4 conditions each. The independent variables of interest were the same

as in the Italian version: *focus type* and *negation*. For negation, two levels were distinguished: [-Negation] and [+Negation], considering the negation-operator *nicht* ‘not’ in compliance with the Italian task, as shown in **Table 3**. Concerning focus type, the elicitation of broad focus and narrow focus crucially differed from Italian because word order cannot be employed to express a certain focus interpretation. Instead, intonation and the position of the negation operator were manipulated, respectively. For both broad focus conditions, the *why*-questions were recorded with the intonational contour L+H* L-% with the nuclear pitch accent on the *wh*-element (e.g., Braun et al. (2019) for the intonation of German *wh*-questions). For the narrow focus conditions, the same nuclear contour was produced but with the NPA on the subject as it also marks contrastive focus (e.g., German Tones and Break Indices, Grice & Baumann 2002). In addition to intonation, we employed the relation between negation positioning and focus in German to reinforce the narrow focus reading of the subject (Blühndorn 2012: chap. 5). Therefore, the negation operator preceded the subject (see supplementary materials M2 for a list of all items).

	[-Negation]	[+ Negation]
broad focus	Warum hat der Angestellte gearbeitet ___? ‘Why did the employee work___?’	Warum hat der Angestellte <u>nicht</u> gearbeitet ___? ‘Why didn’t the employee work___?’
	i) und sich nicht ausgeruht (and did not rest), ‘not TP’ ii) und sich ausgeruht (and rested), ‘TP’ iii) und nicht der Praktikant (and not the intern), ‘not DP’ iv) und der Praktikant schon (and the intern did), ‘DP’	i) und sich nicht ausgeruht (and did not rest), ‘not TP’ ii) und sich ausgeruht (and rested), ‘TP’ iii) und nicht der Praktikant (and not the intern), ‘not DP’ iv) und der Praktikant schon (and the intern did), ‘DP’
narrow focus on the subject	Warum hat der ANgestellte gearbeitet ___? ‘Why did THE EMPLOYEE work_?’	Warum hat nicht der Angestellte gearbeitet ___? ‘Why didn’t THE EMPLOYEE work_?’
	i) und sich nicht ausgeruht (and did not rest), ‘not TP’ ii) und sich ausgeruht (and rested), ‘TP’ iii) und nicht der Praktikant (and not the intern), ‘not DP’ iv) und der Praktikant schon (and the intern did), ‘DP’	i) und sich nicht ausgeruht (and did not rest), ‘not TP’ ii) und sich ausgeruht (and rested), ‘TP’ iii) und nicht der Praktikant (and not the intern), ‘not DP’ iv) und der Praktikant schon (and the intern did), ‘DP’

Table 3: Example of a German item.

In accordance with the Italian task, choice was the dependent variable, again with four options that represent a possible ending of the *why*-question. They were also added by a coordination construction with German *und* ‘and’. These four options make reference to the constituent on which the set of alternatives is built, resulting in the same four possibilities as in the Italian experiment: for the options ‘TP’ and ‘not TP’ (see i) and ii) in **Table 3**), the set of alternatives was created on the TP level. For the options ‘DP’ and ‘not DP’ (see iii) and iv) in **Table 3**), the subject DP was the basis for the creation of the set of alternatives. Again, only unergative verbs and animate common nouns for the subject with a definite article were included in the German task.

In addition to the experimental items, 32 filler sentences were included that were constructed equivalently to the Italian ones (see section 3.1 for further details).

4.2 Participants & Procedure

41 native speakers of German completed the task (mean age = 29.2, range = 19–62, 36 female, 5 male). They participated on a voluntary basis and were not informed about the purpose of the study in advance. We used the same procedure for the German data collection and the same data preparation as for the Italian experiment. Based on the 20 *wh*-questions, which served as controls to check participants’ attention, one participant was excluded from the final analysis.

4.3 Statistical analysis

We followed the same statistical analysis as in the Italian task (for further details see section 3.3 and supplementary materials M1).

4.4 Results

Figure 2 presents the German results showing percentage frequency of the chosen options for non-negated and negated *why*-questions with a broad and a narrow focus interpretation. We found that the option ‘not TP’ was clearly favored by the participants (upper left part of the figure). In this condition, ‘not DP’ was also selected to some extent, while the percentage of the other two options were close to zero. *Why*-questions with negation and a broad focus reading (upper right part of the figure) showed the highest degree of variation. The option ‘DP’ was chosen for half of the stimuli, followed by ‘TP’ and ‘not TP’. A detailed analysis revealed that 32.5% of participants selected the options ‘TP’ and ‘DP’ to a similar extent, whereas 40% clearly preferred the option ‘DP’ and 27.5% the option ‘TP’. Concerning non-negated *why*-questions with a narrow focus interpretation of the subject (lower left part of the figure), participants clearly preferred the option ‘not DP’, but ‘not TP’ was also selected to a small extent. For *why*-questions with negation and a narrow focus reading (lower right part of the figure), ‘DP’ was highly preferred by the participants over the remaining options which were chosen for less than 10% of the presented stimuli.

Summarizing, the findings indicate a clear preference for non-negated *why*-questions as well as negated ones with a narrow focus interpretation of the subject, while more variation was found for the broad focus condition with negation.

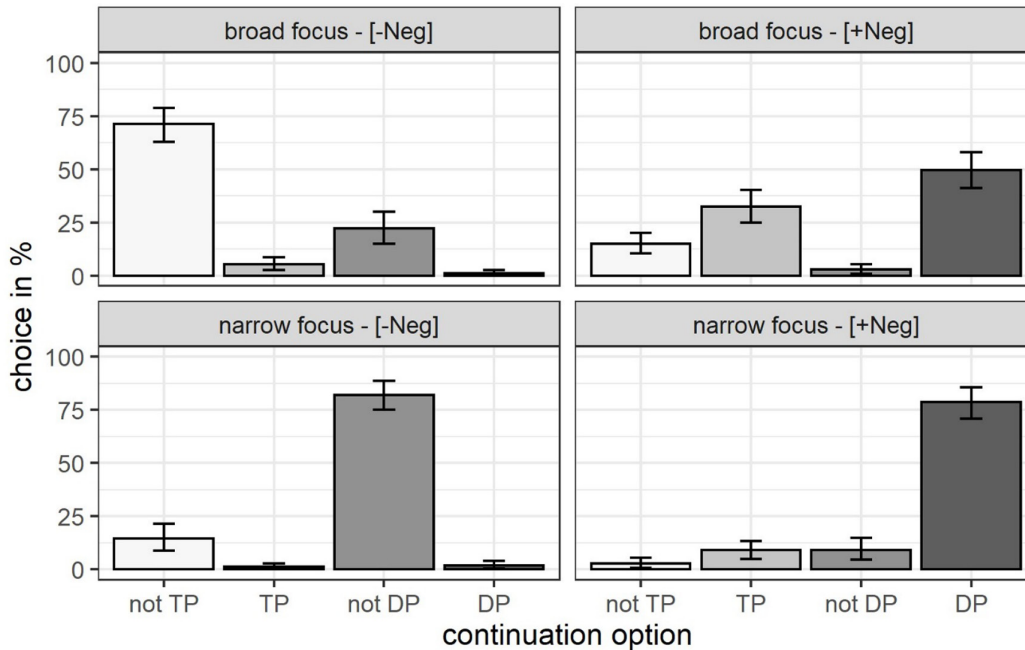


Figure 2: Percentage of selected options for *why*-questions across the negation and focus type conditions in German.

A multinomial logistic regression model was run to investigate how focus type and negation modify the set of alternatives in German *why*-questions. The statistical results are summarized in **Table 4**. The results show that the option ‘not TP’ was chosen significantly more frequently under a broad focus reading and in combination with (–3098, $p < 0.001$) and without negation (–1.892, $p < 0.001$). The presence of negation affected the choice of the option ‘not TP’ negatively in the broad (–3.061, $p < 0.001$) and narrow focus condition (–1.855, $p < 0.001$).

The probability of participants selecting the option ‘TP’ was increased under [+Neg] for both a broad (2.394, $p < 0.001$) and a narrow focus interpretation (2.184, $p < 0.01$) compared to [-Neg]. Concerning focus types, the probability of selection of the option ‘TP’ was lower for a narrow focus interpretation with negation (–1.784, $p < 0.001$) and without negation (–1.574, $p = 0.05$).

The option ‘not DP’ was chosen more often under a narrow than under a broad focus reading in *why*-questions with and without negation ([–Neg]: 3.248, $p < 0.001$; [+Neg]: 1.259, $p < 0.01$). For both focus interpretations, the presence of negation affected the selection of the option ‘not DP’ negatively (broad focus: –2.386; $p < 0.001$, narrow focus: –4.374; $p < 0.001$).

Participants selected the option ‘DP’ more frequently in *why*-questions with negation under both focus interpretations (broad focus: 4.802, $p < 0.001$; narrow focus: 5.917, $p < 0.001$). Focus type had an impact on the choice of the ‘DP’ option in negated *why*-questions. In *why*-questions with negation, the option ‘DP’ was chosen to a greater extent in the narrow focus condition than in the broad focus condition (1.638, $p < 0.001$), while there was no effect of focus type in *why*-questions without negation (-0.523 , $p = 0.48$).

Taken together, the findings indicate that the selection of the option ‘not TP’ was conditioned by focus type and negation, similarly as in Italian. In contrast to Italian, the selection of the options ‘TP’ and ‘not DP’ were also driven by both factors in German. For the option ‘DP’, negation had a greater impact in comparison to focus type, as in Italian.

	‘not TP’ option	‘TP’ option	‘not DP’ option	‘DP’ option
Focus type	lower chance in narrow focus ***	lower chance in narrow focus *(**)	higher chance in narrow focus **(*)	[–Neg]: n.s. [+Neg]: higher chance in narrow focus ***
Negation	lower chance in [+Neg] ***	higher chance in [+Neg] **(*)	lower chance in [+Neg] ***	higher chance in [+Neg] ***
Nagelkerke’s R squared of the model: 0.78				

Table 4: Summary of statistical effects of focus type and negation on the probability of selection of ‘not TP’, ‘TP’, ‘not DP’, and ‘DP’ in German.

*** $p < .001$, ** $p < .01$, * $p < .05$, n.s. $p > .05$.

5 Discussion

With the reported experiments, we wanted to test to what extent the interpretation of *why*-questions changes under the presence of focus (either narrow or broad) and negation, given that negation modifies the truth value of a sentence. The initial hypothesis was that since these alternatives are focal, when negation operates on a *why*-question without narrow focus, the alternatives are generated on the TP but not on a specific constituent of the sentence. Thus, the interaction between negation and focal alternatives is expected to be the same at the semantic level, suggesting a high syntactic position of the *why*-operator in the left periphery. This hypothesis is in line with previous studies (Stepanov & Tsai 2008; Bianchi et al. 2018a) that show a difference between *why*-questions and other *wh*-questions with respect to focal alternatives and quantifiers. More precisely, *wh*-elements are in the scope of the focus operators (32), whereas the focus operator is in the scope of the *why*-operator (31).

(31) (Why) ($\exists x:x = \text{Adam}$) (x ate the apple)

(32) $(\exists x:x = \text{Adam})(\text{When } t)(x \text{ ate the apple at } t)$ (Stepanov & Tsai 2008)

Moreover, when negation has a narrow focus in its scope (i.e., under the presence of a bound focus in the sense of Al-Horais 2017), the truth value of the proposition under the *why*-operator does not change in comparison to the absence of narrow focus. However, based on Büring's (2016) assumptions, we suggest that the set of alternatives does change. To test these two hypotheses in the experiments, two oppositions were crossed: the presence and absence of negation as well as the presence and absence of a narrow focus, resulting in four possible conditions in the two languages.

For both Italian and German, the main results were similar and seem to suggest that alternatives are generated in the same way. The findings confirm most of the expectations derived from declaratives. More precisely, we found that the option 'not TP' has a very low (almost zero) chance of being chosen either under the presence of a narrow focus or in combination with negation. Instead, it was chosen in *why*-questions with a broad focus interpretation and without negation. These results indicate that the set of alternatives is built on the TP, and that the alternatives are negated in this scenario, as proposed by Leben (1998) and Avesani & Vayra (2003) for declarative sentences:

- (33) a. Perché l'impiegato ha lavorato (e non ha riposato)? (option 'not TP')
 why the-employee has worked and not has rested
 a'. Warum hat der Angestellte gearbeitet (und sich nicht ausgeruht)?
 why has the employee worked and REFL not rested
 'Why did the employee work (and did not rest)?'

The option 'not DP' had a very high chance of being chosen when there was a narrow focus present in the *why*-question, but no negation for both Italian and German. For Italian, the data confirms the findings of previous studies on the interaction of focus and word order (Bianchi et al. 2018a; Schmid et al. 2021; Krieger 2024). In Italian *why*-questions, the postverbal subject is focal and the generated alternatives guide the interpretation of the *why*-question. In German, the same interpretation was obtained by prosody. Moreover, these results suggest that in general a narrow focus is commonly used to retrieve the contrast-class if the topic proposition Pk is not negated (in line with Rooth 1992, Bianchi et al. 2018a, and Beltrame 2018 for *why*-questions and declarative sentences). Thus, the alternatives in *why*-questions are:

- (34) a. Perché ha lavorato l'impiegato (e non il tirocinante)? (option 'not DP')
 why has worked the-employee and not the intern
 a'. Warum hat der Angestellte gearbeitet (und nicht der Praktikant)?
 why has the employee worked and not the intern
 'Why did the employee work (and not the intern)?'

The results were less straightforward when negation was considered, especially under a broad focus reading (i.e., wide focus in the sense of Al-Horais 2017). Interestingly, in both languages, the option ‘TP’ had a high probability of being chosen in the presence of broad focus and negation, but its probability dropped dramatically under a narrow focus reading. These results confirm the assumption that the alternatives can be built on the polar set of the whole TP (as suggested by Rooth 1992 for declarative sentences) in combination with a broad focus interpretation. However, the option ‘TP’ was not the only highly chosen option in negated *why*-questions with a broad focus reading. The option ‘DP’ had an even higher chance of being selected. This ambiguity suggests that in these *why*-questions, the alternatives can either be built on the whole sentence (35a-a’) or on the subject DP (35b-b’):

- (35) a. Perché l’impiegato *non* ha lavorato (e ha riposato)? (option ‘TP’)
 why the-employee not has worked and has rested
- a’. Warum hat der Angestellte *nicht* gearbeitet (und sich ausgeruht)?
 why has the employee not worked and REFL rested
 ‘Why did the employee not work (and rested)?’
- b. Perché l’impiegato *non* ha lavorato (e il tirocinante sì)? (option ‘DP’)
 why the-employee not has worked and the intern did
- b’. Warum hat der Angestellte *nicht* gearbeitet (und der Praktikant schon)?
 why has the employee not worked and the intern did
 ‘Why did the employee not work (and the intern did)?’

At this point, the question arises why such an ambiguity only occurs in *why*-questions with a broad focus interpretation in combination with negation, while it is absent with narrow focus. We assume that negation per se adds complexity at both the syntactic and the semantic level of the utterance, and under the absence of narrow focus, the scope of the negation is less evident, i.e., whether it is a bound focus (Al-Horais 2017) or not. Moreover, the fact that the ‘DP’ option is the clearly preferred one in *why*-questions with narrow focus in the scope of the negation (i.e., under bound focus in Al-Horais’ 2017 terms) has two implications: first, it corroborates our interpretation of questions with broad focus and negation. Second, it indicates that the alternatives driving the interpretation of the *why*-question are focal alternatives and behave as described by Büring (2016) for declarative sentences. More precisely, this finding shows that the alternatives are built on the DP (i.e., the subject), implicating that someone else instead of the employee worked, as illustrated in the following example:

- (36) a. Perché *non* ha lavorato l’impiegato (e il tirocinante sì)? (option ‘DP’)
 why not has worked the-employee and the intern did

- a'. Warum hat *nicht* der Angestellte gearbeitet (und der Praktikant schon)?
 why has not the employee worked and the intern did
 'Why did the employee not work (and the intern did)?'

In addition to these similarities for the most important results of our study, the findings also show minor differences between the languages. For instance, selections of the options 'TP' and 'not DP' were more straightforward in German than in Italian but this only applied to conditions in which they were marginally selected. These differences might be due to a task effect, that is, the experimental stimuli in our task were presented without a context, and participants had to rely only on the information provided by word order and prosody to choose the continuation of the *why*-question. In this respect, we want to stress that for each stimulus at least three out of four continuation options were compatible with the *why*-questions concerning the linear order, (i.e., for the three options there might exist a situation for which it can be combined with the *why*-question). Thus, not providing a context might create at least some space for participants' interpretation and lead to individual variation. This task effect might also explain why, although very marginally, some continuations were also chosen where they were not expected.

Overall, our results provide two important implications, even though the results have to be interpreted carefully due to the task design of forced-choice experiments. First, despite the syntactic differences between Italian and German regarding subject positioning, *why*-questions in the two languages behave very similarly at the semantic level. Second, from what has been reported in several sources in the literature (e.g., van Fraassen 1980; Beltrame & Chesi 2021), the alternatives of *why*-questions depend on information structure. Indeed, in both languages, narrow focus is used to elicit contrast-class alternatives. If narrow focus is absent, there is a tendency to build the alternatives on the propositional level, especially in absence of negation. Accordingly, the computation of alternatives should take place once the *why*-operator merges in the IntP in order to have scope over the entire proposition (as proposed by Stepanov & Tsai 2008). The hypothesis that the interaction between focus and negation in *why*-questions is very similar to that in declaratives is also confirmed by our results: negation per se changes the truth value of the expressed proposition, and influences the alternatives by determining whether or not they are negated in turn. Whereas the presence or absence of a narrow focus changes the level of the elicited alternatives (i.e., at the DP or at the TP). The fact that their interaction is pragmatic can partially justify the results obtained for questions with broad focus and negation. In this case, both readings seem to be available (i.e., alternatives constructed at the level of DP or TP). This could also be due to the fact that negation per se adds complexity at both the syntactic and semantic levels, leading to less evidence regarding the scope of negation. Another explanation for the selection of the DP-alternative might be that *why*-questions with sentential negation and

broad focus are also compatible with a contrastive topic interpretation of the subject similar to what has been shown in declaratives (e.g., Fery & Samek-Lodovici 2006).⁸

6 Conclusion

In this paper, we investigated the particularities of Italian and German *why*-questions at the syntax-semantics interface and the interaction of focus and negation in these clauses. For this purpose, we conducted a multiple forced-choice experiment in the two languages. The results showed that *why*-questions show the same semantic characteristics in Italian and German despite their syntactic differences (e.g., subject positioning). The findings further indicated that the set of alternatives in *why*-questions behaves like focal alternatives, even under the presence of negation. This finding was supported by *why*-questions with narrow focus and broad focus. For Italian *why*-questions without negation, our results confirmed the results of previous studies (Bianchi et al. 2018a; Krieger 2024). In *why*-questions with a preverbal subject, alternatives are built on the TP, while alternatives are built on the DP if the subject occurs in postverbal position. The same applies to German, where subjects generally cannot appear in a preverbal position, but prosody signals the presence of either a broad focus or a narrow focus, thus guiding the construction of alternatives. The presence of narrow focus changes the set of alternatives compared to broad focus. Instead, negation changes the truth value of the topic proposition, thus adding complexity to the sentence. This complexity might explain why our prediction concerning *why*-questions with sentential negation and the absence of narrow focus were only partially met as the scope of the negation might be less evident. Future studies should investigate the impact of the type of conjunction on the creation of alternatives. For instance, it would be interesting to study Italian *ma* and the German *aber* ‘but’ instead of the Italian conjunction *e* and the German *und* ‘and’ in the four possible continuations. *But*-conjunctions could block several ambiguous readings and consequently prevent some options from being chosen.

⁸ If this explanation is on the right track, the contrast class might be triggered by contrast rather than focus per se (see e.g., Vallduvi & Vilkkuna 1998).

Abbreviations

INS = instrumental, PART = particle, PL = plural, SG = singular, VOC = vocative

Data availability

The R code and data that support the findings of this study are openly available in Open Science Framework at https://osf.io/5nb7t/?view_only=b76f9f343db5461bb8ead0289d1daa91.

Ethics and consent

The study was created in accordance with the ethics clearance of the LingLabs of the University of Konstanz before data collection. All participants read and signed written consent forms before participating in the study.

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Competing interests

The authors have no competing interests to declare.

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