Experimental Testing of Focus Fronting in British English

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This paper presents experimental results concerning the grammaticality of focus fronting affecting DP/PP complements in British English across three types of conversational exchanges: replies to open questions, replies to closed questions, and corrective replies to an incorrect statement. Its distinctive features, described in further detail below, include (i) its size, it involved 101 participants; (ii) the usage of spoken experimental stimuli which allowed for prosodic cues, (e.g. stressed foci) that decreased the chances to misinterpret the stimuli through an incorrect assignment of focus and topic features, for example by interpreting fronted foci as topics, as it might happen with written stimuli; (iii) the careful design of the stimuli to prevent effects related to the syntactic properties of the assessed sentences; specifically, we ensured that the assessed sentences varied across four tenses and involved verbs taking animate and inanimate complements, as well as nominal and prepositional complements.

The experiment provided three main results, all statistically significant: (i) in-situ foci were assessed as significantly more natural than fronted foci across all three exchange types, confirming similar experimental results across corrective, mirative, and lexically contrastive exchanges provided for Italian in Bianchi, Bocci, and Cruschina (2015), for Spanish in Cruschina (2019)[1], and for imperative clauses in Italian, Spanish, and English in Frascarelli and Jiménez-Fernández (2021); (ii) fronted foci in response to closed questions were assessed as significantly more natural than fronted foci in response to open questions; (iii) fronted foci in response to open questions were assessed as significantly more natural than fronted foci in corrective responses.

Some of these results, especially (i) and (iii), were unexpected. We provide our interpretation in section 4, discussing how they provide support for (a) the in-situ analysis of

[1] Bianchi, Bocci, and Cruschina (2015) and Cruschina (2019) use the term 'contrastive' for focalized items like *TAXI* in (1) where focus involves contrast against another lexical item but does not involve a corrective interpretation. Since the term *contrast* is very frequently used in the information structure literature for corrective exchanges, we prefer to characterize exchanges like (1) as *lexically contrastive* and keep using the unqualified term *contrastive* for the corrective exchanges examined in this paper.

(1) A: I am going home.
B: Take a TAXI$_F$ (not the subway).

contrastive focalization, (b) the availability of contrastive replies to open questions as per Skopeteas and Fanselow (2011) and against widely held assumptions to the contrary, (c) the definition of contrast as involving the denial of focus alternatives as proposed in Neeleman and Vermeulen (2012), and (d) the degrading effect of linguistic processing on naturalness judgements.

Section 1 provides the theoretical context that led us to running this experiment. Section 2 details the experiment's components and overall organization. Section 3 provides the statistical results. Section 4 offers our interpretation of the results, already summarised above.

1 Theoretical context

Ever since Rizzi's (1997, 2004) and Belletti's (2001, 2004) seminal works on the position of contrastive and non-contrastive focus in Italian, focused constituents have been generally assumed to be able to front when involving a contrastive interpretation and unable to front under a non-contrastive, presentational reading. Exactly how contrast should be defined and which discourse contexts elicit its presence, however, has been and still is under debate; see amongst others Rooth (1992, 2016), Büring (1997, 2003), Kiss (1998), Molnár (2002), Kenesei (2006), Zimmerman (2007, 2008), Krifka (2008), Repp (2010, 2016), Horvath (2010), Krifka and Musan (2012), Neeleman and Vermeulen (2012), Bianchi and Bocci (2012), and Cruschina (2021), as well as the works in Molnár and Winkler (2006), Repp and Cook (2010), and in this volume.

Experimental data revealing which discourse contexts genuinely allow for fronting, and hence under current assumptions also which contexts allow for the presence of contrast, play an important role in advancing this debate, as they provide a clearer picture of the linguistic data that need to be explained, as well as test the divergent predictions made by competing analyses about those data. The experiment reported here tested the availability of focus fronting in corrective, open question, and closed question exchanges with the goal of determining whether close questions involved contrast, as this in turn distinguishes between Krifka's (2008) and Neeleman and Vermulen's (2012) analyses of contrast, as further explained below.

Corrective exchanges like (1) were included in the experiment with the expectation that they would provide the benchmark case for grammatical sentences containing contrast. Rizzi (1997) and most subsequent literature, including the more articulated investigation in Bianchi and Bocci (2012), Bianchi (2013) and Bianchi, Bocci and Cruschina (2015) on Italian data, assume that corrective exchanges involve contrast and license focus fronting as its visible, albeit optional, effect. To our suprise, these exchanges were instead assessed as those where

fronting is least natural amongst those we tested, showing how important it is to empirically and crosslinguistically test even the most uncontroversial assumptions. In section 4, we interpret this unexpected result as due to the degradation of naturalness assessment brought about by processing load and interpret them as potential evidence for in-situ analyses of contrastive focalization. (The 'F' subscript marks the focused phrase. Main stress in capitals.)

(1) Contrastive exchanges: A: John hit Bill.
B: TOM_F, he hit.

Similarly, the experiment included open question exchanges like (2) under the widely held assumption that they do not license contrast, and hence could not license fronting either, thus potentially acting as a benchmark for the absence of contrast. Our experimental results challenge this assumption, showing that fronting in open question exchanges is more readily available than in corrective exchanges. In section 4, we follow Skopeteas and Fanselow (2011) in interpreting this result as stemming from the possibility for speakers to provide contrastive replies even in contexts that do not require the presence of contrast.

(2) Open question exchanges: A: Who did John hit?
B: TOM_F, he hit.

Finally, we included closed questions exchanges, illustrated in (3). These were the cases most pertinent to our original research goal, which aimed at empirically identifying the most successful analysis of contrast amongst the two provided in Neeleman and Vermeulen (2012) and Krifka (2008). Their analyses appeared particularly fit for empirical testing because they make convergent predictions for corrective and open question exchanges, but diverge with respect to closed questions, which are considered to involve contrast (and hence potentially fronting) under Neeleman and Vermeulen (2012:8-9), whereas they are necessarily non-contrastive under Krifka (2008:258-59), as explained in more detail below (see also Samek-Lodovici 2018).

(3) Closed question exchanges: A: Who did John hit, Tom or Bill?
B: TOM_F, he hit.

Neeleman and Vermeulen (2012) define contrast as denying the validity of at least one of the alternative propositions contained in the focus value of a sentence. Intuitively, the focus value of a sentence contains all the propositions formed by replacing the focused constituent with a contextually salient alternative as per Rooth (1985, 1992, 2016). For example, the focus value

of (3B) consists of the propositions 'John hit Tom' and 'John hit Bill'. Under Neeleman and Vermeulen's analysis, speaker B may use contrast to deny the alternative 'John hit Bill', thus predicting the grammaticality of contrast-induced focus fronting in (3B).

Under Krifka (2008:259), instead, focus is contrastive whenever the Common Ground – the shared knowledge formed by all propositions that both interlocutors know to hold and be mutually known to hold – contains at least one proposition that differs from the proposition being asserted but it is also a member of its focus value (i.e. a proposition identical to the asserted proposition but for the focused constituent). For example, in the corrective exchange in (1) above, the proposition 'John hit Tom' asserted by speaker B involves contrast because it differs from the proposition 'John hit Bill' introduced into the Common Ground by speaker A and, crucially, the proposition 'John hit Bill' just mentioned also belongs to the focus value of speaker B's assertion.

Under Krifka's analysis, however, contrast is predicted to be absent in closed question exchanges like (3) because questions are maintained to manage expectations about the future updating of the Common Ground and as such they cannot add propositions to it. Therefore, question (3A) does not add any proposition to the Common Ground, which remains empty. Consequently, (3B) does not involve contrastive focalization, since the asserted proposition – namely 'John hit Tom' – does not contrast with any proposition in the Common Ground. Since contrast is absent, focus fronting is predicted to be unavailable as well.[2]

Our experimental results showed closed question exchanges emerge as the most natural context for focus fronting. This result would appear to support Neeleman and Vermeulen's analysis. The results associated with open question and corrective exchanges, however, do not fit the convergent predictions made by either of Krifka's and Neeleman and Vermeulen's analyses, a point we return to in section 4.

The next two sections describe the experimental setup and presents the experimental results in statistical terms, followed by our interpretation in section 4.

[2] More precisely, the prediction follows from Krifka's (2008) characterization of contrast once combined with the assumption that contrast optionally licenses fronting. As pointed out by an anonymous reviewer, this latter assumption is raised only in passing in Krifka (2008:259) which mentions "[the existence of] evidence for particular marking strategies for contrastive focus like the use of particular syntactic positions […]". Therefore, while the prediction follows from Krifka's analysis, it should not be attributed to Krifka directly.

2 Method

2.1 Participants

One hundred and one participants were recruited from University College London, Queen Mary University and York University by advertisement and through the Prolific online recruitment service, which is used widely in academic research. All participants (48 male, 51 female, 2 other) were aged 18-65 and were native British speakers of English. Informed consent was obtained from all participants, who were remunerated at a rate of £9.50 per hour for participation in the study.

2.2 Materials

This study aimed to measure participants' grammaticality judgments of focus fronting across three conversational exchanges: open questions, closed questions, and corrective exchanges.

The task consisted of 96 mini dialogues in the form of adjacency pairs (Sacks et al. 1974, Schegloff and Sacks 1973). Within Conversation Analysis, adjacency pairs refer to two successive turns in conversation produced by different participants whereby the second utterance is conditionally relevant by its prior turn, for example, question-answer, statement-correction, greeting-greeting, invitation-acceptance, request-acceptance, and so on. All adjacency pairs in the study were of the type questions-answer action or statement-correction action. Each adjacency pair included a single utterance from speaker A setting the discourse context and a single response from speaker B containing the experimental item or a filler item. As further explained below, speaker A's utterance was presented in written form, whereas speaker's B response was presented as audio, i.e. the participants heard a spoken sentence.

The 96 adjacency pairs included 36 fronted target items where focus occurred fronted, 36 corresponding in-situ items where focus remained in-situ, and 24 fillers. In each adjacency pair, the context provided by speaker A was one of three forms: (i) an open question (e.g. *Who did John hit?*); (ii) a closed question with two choices (e.g. *Who did John hit, Tom or Bill?*; or (iii) a statement (e.g. *John hit Bill*).

For the open and closed question contexts, speaker B's response consisted of an answer focalizing the constituent corresponding to the wh-phrase. For the fronted target items, speaker B's response involved focus fronting (e.g. *TOM, he hit*). For each target item there was a corresponding in-situ item where focus remained in situ (e.g. *he hit TOM*). For corrective exchanges, the context provided by speaker A was a statement that speaker B's response corrected (e.g. A: *John hit Bill.* – B*: TOM, he hit*). Here, too, for each target item there was a corresponding item where focus remained in-situ (e.g. A: *John hit Bill.* – B: *He hit TOM*).

Across all three contexts, speaker B's responses consisted of pre-recorded single sentences. Having single sentences ensured that naturalness judgements were made in regard to the target item and not influenced by linguistic information within additional sentences that could affect the focus, topic, or givenness status of the constituents in the target item. Presenting auditory stimuli provided a more naturalistic presentation of the stress pattern of the fronted element and mitigated against participants attempting to apply their own prosody, which again could potentially determine an incorrect assignment of focalization and topic features to the target sentences that could affect their grammaticality judgements (on this issue, see Frascarelli and Jiménez-Fernández 2017, 2021).

Also, six of the target responses to the closed questions fronted the first alternative mentioned in the question (e.g. A: *Who did John hit, Tom or Bill?* – B: *TOM, he hit*), while the remaining 6 closed question responses fronted the second alternative (A: *What did Jane send, roses or tulips? – B:* TULIPS, she sent)[3]. This alternation in closed questions was designed to mitigate against participants demonstrating a bias towards selecting items that had occurred in a particular position in the context, or assuming that the task was investigating their judgments of a recency effect. However, to ensure that judgments of fronted sentences could not be attributed to a lexical bias towards specific items or to change in prosody, the same 12 choices (six corresponding to the first alternative and six for the second) were kept invariant across the responses to the 3 fronted contexts (i.e. B's response used *TOM*, rather than Bill, across the related open and closed question items as well as in the related statement-correction item. Similarly for the adjacency pairs involving the second alternative, say *TULIPS*).

Additionally, there were two sets of 12 non-corresponding in-situ fillers, which deviated from the target items more significantly. The first set involved adjacency pairs where speaker A produced the same open and closed questions described above (e.g. A: *Who did John hit?* and A: *Who did John hit, Tom or Bill?*), but speaker B's response was a single word (e.g. B: *Tom.)*, while in the second set B's response consisted of a single sentence containing a negative marker negating the presupposition in speaker A's question (e.g. *He didn't hit anyone*). Examples of experimental stimuli are listed in Table 1.

[3] The speakers' identifiers 'A' and 'B' used in these examples are provided for clarity. They did not appear in the experimental stimuli. See the *Procedures* section below.

Table 1: Task stimuli for target items and corresponding in-situ items for open and closed questions, corrective exchanges, and non-corresponding filler items.

Exchange type	**Speaker A's written context**	**Speaker B's spoken response**	
		Fronted	**In-situ**
Open questions	Who did John hit?	TOM, he hit.	He hit TOM.
Closed questions (1st alternative)	Who did John hit, Tom or Bill?	TOM, he hit.	He hit TOM.
Closed questions (2nd alternative)	What did Jane send, roses or *tulips*.	TULIPS, she sent.	She sent ROSES.
Corrective exchanges	John hit Bill.	TOM, he hit.	He hit TOM.
			Non-corresponding in-situ Fillers
Open questions	Who did John hit?		TOM.
Closed questions	Who did John hit, Tom or Bill?		He didn't hit anyone.

Twelve verbs were used across all item sentences and had an equal distribution of either Determiner Phrase (DP) (*N=6*) or Prepositional Phrase (PP) (*N=6*) expressing an animate (*N=6*) or inanimate argument (*N=6*); see Table 2. Prepositional phrases had either '*to*' and '*for*' as head and were equally distributed across animate and inanimate arguments of the verb. Four tenses were used across the sentences: past tense (either regular or irregular form), present simple, present perfect, or present progressive. Each tense occurred 3 times and these were equally distributed across the DP and PP animate and inanimate argument structures.

Table 2: Verbs and tenses used across speaker A's contexts and speaker B's responses (both experimental items and fillers).

	Determiner Phrase	**Prepositional Phrase**	**Tense**
Animate	*hit*	*speak to*	Past
	see	*worry about*	Present
	meet		Present perfect
		wait for	Present progressive
Inanimate	*send*		Past
		paint with	Present
	have	*travel to*	Present perfect
	buy	*apply to*	Present progressive

The audio stimuli used as target items were recorded by the second author on an Olympus DM-20 dictaphone and edited in Audacity, an open-source digital audio editor, to create separate sound files. Recordings of responses for the adjacency pairs were saved as individual mp3 files and uploaded onto UCL Gorilla. All the stimuli involve main stress on the focused word, e.g. *TOM, he hit*. All audio stimuli are available for inspection online via the UCL Research Data Repository (RDR) at Samek-Lodovici and Dwyer (2022).

2.3 Procedures

The naturalness judgement task was presented online on the Gorilla platform (Anwyl-Irvine, et al., 2020). Prior to the administration of the grammaticality judgment task, and following the completion of informed consent and providing of demographic information, working memory function was assessed using the WAIS-III (Wechsler, 1997) Reverse Digit Span, which requires verbal working memory and attention, and, additionally, tests cognitive control and executive function. This was administered to determine that potential differences in naturalness judgements were independent of working memory. For this reason, the score on Reverse Digit Span was entered as a covariate in the main analysis.

2.3.1 Working memory

Each trial began with a black fixation point on a white background. This was followed by a sequence of randomised digits, each presented in turn for 2000ms before disappearing from the screen. On the right of the screen was a red number pad with digits from 0 to 9. The participants

were asked to repeat the sequence of randomised digits in reverse order by entering them on the keypad. They were instructed to wait until all numbers had been shown before entering their response and to not write the numbers down as a memory strategy. If the participant responds correctly to three sequences of the same length, the next trial presents a longer sequence with one additional digit. The task automatically finishes when the participant responds incorrectly on three occasions under the same span length. The working memory span score represents the longest number of sequential digits that is correctly reported. The responses provided by the participants were scored automatically by the software. Prior to the task, they were given a trial of two sequences in order to familiarise themselves with the format of the task and to ensure they knew how to use the on-screen keypad.

2.3.2 Grammaticality judgements

Participants were informed that they would be presented with contextualised mini dialogues involving two speakers (speaker A and speaker B). Presentation of the dialogues was randomised automatically by the software.

At the start of the judgement task, before all trials, participants were told that speaker A's utterances would be presented in written form on the screen for 3 seconds. They were also asked to read aloud speaker A's statements or questions as they were presented on the screen. Figure 1 shows how the utterance was then presented in each trial.

Figure 1: Presentation of speaker A's utterance

Once this context disappeared from the screen, the target item (speaker B's spoken response) was presented auditorily while simultaneously showing an empty speech bubble on the screen (Figure 2).

Figure 2: Presentation of B's response. Participants saw this image while listening to B's response.

Participants were asked to carry out a grammaticality judgement of speaker B's utterance after they heard each sentence: they were instructed to rate the grammaticality of the target sentences according to a 7 item Likert scale by pressing buttons 1 to 7 on the on-screen keyboard (Figure 3).

Figure 3: Presentation of the Likert scale

Their responses to each item were recorded automatically by the software. There was no limit to the allowed response time but once the participant had responded by providing a judgement score (i.e. by pressing a button), the task automatically moved to the next trial item. There was no time limit for the entire task duration either. Completion time was on average approximately 15 minutes.

3 Results

The experimental data gathered in this experiment and used for the statistic analysis described in this section are available for inspection at Samek-Lodovici and Dwyer (2022).

The Likert scores for grammaticality judgement responses across the 101 participants were summed to produce 6 total scores: 3 for the target fronted structures and 3 for the corresponding in-situ items, with the following means (M) and standard deviations (std): open questions fronted M=45.87 (std=17.65) vs. open questions in-situ items M=72.5 (std=11.65); closed questions fronted M=47.65 (std=17.35) vs. closed questions in situ items M=72.35 (std=12.34); corrective exchanges fronted M=38.46 (std=15.62) vs. corrective exchanges situ items M=60.1 (std=18.08)). Data were entered into a one-way repeated measures ANCOVA with working memory scores as a covariate and analyzed in IBM SPSS Statistics for Windows, Version 27.0. Mauchly's test indicated that the assumption of sphericity had been violated, $\chi^2(14) = 465.96$, $p < 0.001$. Therefore, degrees of freedom were corrected using Greenhouse-Geisser estimates of sphericity ($\varepsilon = 0.39$).

The repeated measures ANCOVA with a Greenhouse-Geisser correction determined that there was a statistically significant effect of structure type ($F(1.937,191.802) = 5.524$, $p = 0.005$), there was no effect of working memory ($F(1,99) = 1.338$, $p = 0.25$), and no interaction between structure and working memory ($F(1.937,191.802) = 2.013$, $p = 0.14$), demonstrating that working memory did not influence judgements[4]

Post hoc analysis of pairwise comparisons with a Bonferroni adjustment were carried out to compare differences between item types. These revealed that there was a significant difference between each of the 3 contexts for fronted structures and their in-situ counterparts: fronted replies to open questions vs. in-situ replies ($p < 0.001$); fronted replies to closed questions vs. in-situ replies($p < 0.001$); fronted replies to corrective exchanges vs. corrective

[4] The F-value is the ratio of two variances (two mean squares), measuring the dispersal of the data points around the mean. The F-value is calculated as: F-value = variation between sample means / variation within the samples. The further the individual data points are from the mean, the higher the degree of variance. The F-value is large when the variation between the sample means is high relative to the variation within each of the samples. The p-value (probability value) represents the likelihood that the data would have occurred by random chance (i.e. that the null hypothesis is true). It is a value between 0 and 1 - the smaller the p-value, the stronger the evidence that the null hypothesis should be rejected.

exchanges in-situ replies($p < 0.001$), with participants scoring all 3 fronted structures less natural than their in situ versions in each case.

The Bonferroni adjusted pairwise comparisons of the fronted items showed that participants rated fronted replies to closed questions significantly more natural than fronted replies to open questions ($p < 0.05$), and fronted replies to open questions significantly more natural than fronted replies to corrective exchanges ($p < 0.001$). Fronted replies to closed questions were also scored as significantly more natural than fronted replies in corrective exchanges ($p < 0.001$).

The box and whisker chart for the target fronted sentences and corresponding in-situ sentences is provided in Figure 4. From left to right, the figure lists the box and whisker charts for fronted items in open question responses, in-situ items in open question responses, fronted items in closed question responses, in-situ items in closed question responses, fronted items in corrective responses, and in-situ items in corrective responses. Each box and whisker chart shows the median and mean value for each context (respectively marked as the line dividing the 2nd and third quartiles, and as 'X'). To avoid cluttering, these numbers were cut at one decimal place. The two-decimal place averages are 3.83 (OpenQsFronted), 6.04 (OpenQsInSitu), 3.97 (CloseQsFronted), 6.03 (ClosedQsInSitu), 3.20 (CorrectExchFronted), and 5.01 (CorrectExchInSitu) respectively.

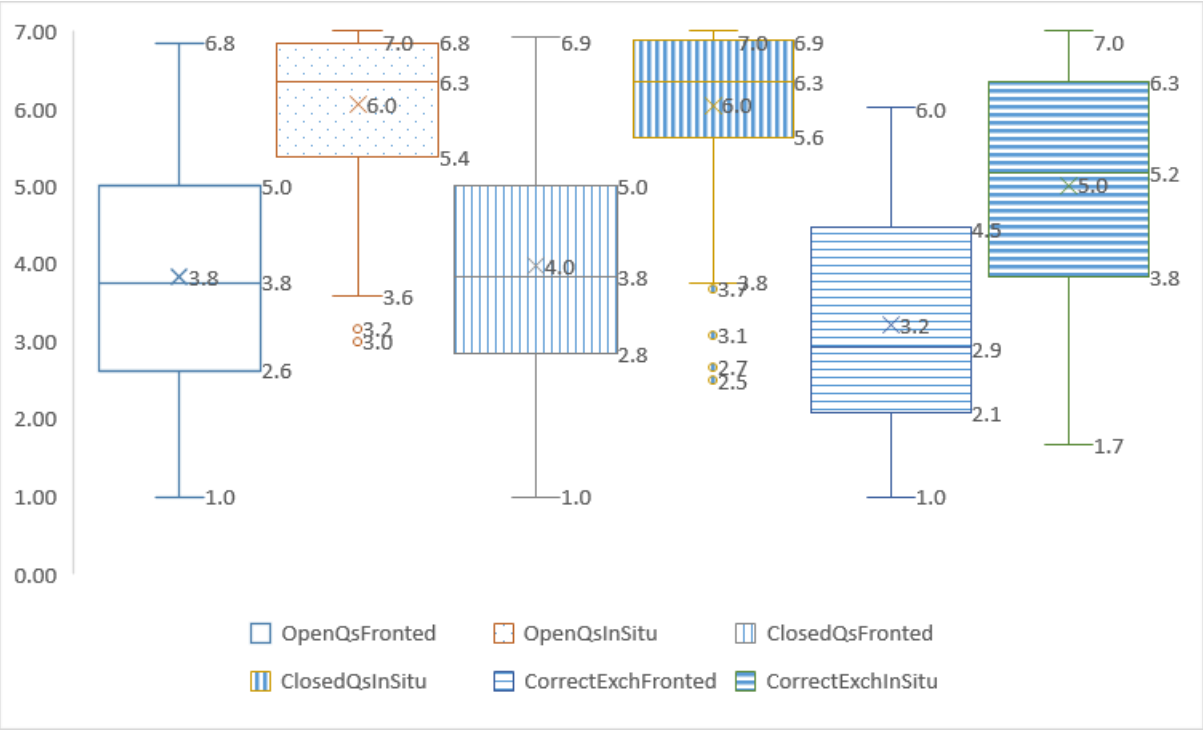

Figure 4: Box and whisker charts.

4 Discussion

When we designed the experiment, we expected fronting to be most natural in corrective exchanges due to the widely assumed presence of contrast under these contexts, and least natural with open questions due to the equally widely assumed absence of contrast in these second set of contexts. The experimental results do not fit with these assumptions, showing that these assumptions do not accurately capture the linguistic reality of focus fronting in British English and need to be reconsidered. Below, we offer our interpretation of these results, taking the naturalness judgements provided by the experimental participants as proxy for grammaticality judgements. Note that our experiment only concerned the fronting of focused complements, thus remaining insensitive to any subject/object asymmetries such as those described in Breul (2007) and Skopeteas and Fanselow (2010).

4.1 Fronting vs in-situ focalization

We start with the divergence between in-situ and fronted focalization, where the higher grammaticality of in-situ foci over fronted ones emerged as statistically significant across all three exchange types. This result lends support to claims that contrastive focalization can be interpreted in-situ (Rooth 1992, 2016, Wagner 2020: section 3.16) and, therefore, also to the claim that contrastive focalization per se does not require the existence of a left-peripheral FocusP projection obligatorily attracting all contrastive foci to its specifier (Samek-Lodovici 2015, to appear, see also Brunetti 2004, Costa 2013, Abe 2016, Borise and Polinsky 2018 respectively proposing in-situ focalization in Italian, Spanish, Japanese, Georgian within wider analyses of specific phenomena, as well as Kolliakou 2004, Szendrői 2010, Samek-Lodovici 2010 in relation to focalization within DPs).

An in-situ focalization analysis would still have to explain why foci may front despite fronting being disfavoured relative to in-situ realization. Analyses that allow contrastive focalization to occur in-situ usually view its fronting as licensed by independent optional processes such as, in Italian, the syntactic marking of the rest of the clause as discourse-given through the application of right dislocation (Samek-Lodovici 2015), or, in Dutch, the marking of the focus background in terms of syntactic-sisterhood (Neeleman and van de Koot 2008).

Fronting might remain associated with the presence of contrast, but only as an optional operation constructing a syntactically marked structure that facilitates the conveyance of the intended interpretation, as proposed in Skopeteas and Fanselow's (2011) analysis of contrastive replies to open questions discussed in greater length in section 4.2 below.

In all these analyses, the additional processing required by the independent processes responsible for fronting could be the factor that determines its experimentally attested lower grammaticality relative to in-situ constructions. Since the additional processes responsible for fronting are all optional, it is sufficient for some speakers to disfavour the additional processing associated with those processes to lower its overall grammaticality, independently of the specific context being tested (see also Breul 2007).

While the analyses supporting focalization in-situ must explain the cases where fronting remains marginally acceptable, the FocusP analyses á la Rizzi (1997) positing a left-peripheral FocusP projection face an even harder task in explaining the high grammaticality of in-situ focalization. These analyses maintain that contrastively focused phrases obligatorily raise to the specifier of FocusP for interpretative reasons, with fronting corresponding to structures where movement is visible (i.e. occurring before spell-out) and in-situ focalization corresponding to structures where movement is covert (i.e. post spell-out), or, as in Bianchi (2019), assuming that fronting precedes spell-out but it is followed by the deletion of the specFocusP copy. Crucially, under all of these analyses, the processing load of the in-situ constructions would appear at best identical and at worst higher than the processing load of their fronted counterparts, thus offering no explanation for why the in-situ option is preferred by native speakers across all contexts.

4.2 Fronting across different exchanges

The experiment shows that fronting under closed questions is significantly more grammatical than under open questions, where, in turn, it is significantly more grammatical than in corrective exchanges. These results raise three questions: (i) why fronting in open question exchanges emerges as grammatical against widely held expectations; (ii) why fronting in corrective exchanges is assessed as marginally grammatical at best and less grammatical than under open questions, again against widely held expectations; (iii) whether the experiment provided sufficient information to empirically test the analyses of contrast in Neeleman and Vermeulen (2012) and Krifka (2008) as originally planned.

Starting with question (i), the assumption that contrast-induced focus fronting should not occur in open question exchanges is rooted in Rizzi's (1997) and Belletti's (2001, 2004) seminal papers on Italian focalization, with Rizzi's examining contrast-induced focus fronting in the left-periphery, and Belletti's analysing non-contrastive focalization located between T and VP. Together, these papers suggested a division of labour with contrastive focus targeting the left-periphery and non-contrastive focus targeting a lower region within TP.

Hard evidence for the unavailability of focus fronting in open question exchanges is hard to come by. On the contrary, there are multiple experimental results that attest the presence of focus fronting under open questions. They include the fronting of non-contrastive object foci in Southern Peninsular Spanish in Jiménez-Fernández (2015a), the higher frequency of focus fronting under open questions when measured against fronting under corrective exchanges in Catalan in Feldhausen and Vanrell Bosch (2014) – a result very similar to those reported in this paper for British English – and, finally, the experimental results reported in Skopeteas and Fanselow (2011) about the interpretation of fronted object foci in open question exchanges across Hungarian, German, Spanish, and Greek.

The latter study shows that in German, Spanish, and Greek fronted objects can be interpreted contrastively even when occurring in replies to open questions, with contrast interpreted as excluding focus-induced alternatives as in Neeleman and Vermeulen's definition. Skopeteas and Fanselow propose an interesting reason for why fronting might be available in open questions exchanges. Under their analysis, open questions remain associated with non-contrastive focalization. However, speakers may nevertheless reply with a marked structure – namely focus fronting – to signal a marked interpretation, namely a contrastive one. Put differently, open questions do not themselves license contrastive focalization in their replies, but they do not disallow it either. If correct, the relatively high 3.82 average score assigned to fronting under open questions in our experiment would reflect the presence of participants that chose to interpret fronted replies in these exchanges as grammatical because they are potentially licensed by a contrastive interpretation.

Once coupled with Neeleman and Vermeulen's definition of contrast, Skopeteas and Fanselow's (2011) analysis also accounts for the higher average assigned to fronting in closed questions (3.97) relative to open questions (3.82). If closed questions license contrast as proposed by Neeleman and Vermeulen, and contrast licenses fronting, then fronting is necessarily more natural under closed questions, where it is inevitably present, than under open questions, where its presence is dependent on the choice of individual speakers to allow a contrastive interpretation rather than mandated by the discourse context. Since the same cannot be said for Krifka's analysis of contrast, these experimental results offer some support to Neeleman and Vermeulen's analysis of contrast.

Question (ii), seeking the reason for the marginal grammaticality of fronting in corrective exchanges, is the most difficult. Here, we can only offer two hypotheses that will need further research.

The first hypothesis concerns the possible presence of two grammars across speakers of British English, one allowing for focus fronting in corrective exchanges and the other disallowing it (on the availability of micro parametrization in relation to focus fronting, albeit in Spanish varieties, see Jiménez–Fernández 2015b). If this were the case, the participants' judgements for fronting in corrective exchanges should cluster into two groups, with participants that disallow fronting returning relatively low grammaticality values and those allowing for fronting relatively higher values. As shown by the histogram in Figure 5, the average values assigned by the 101 participants across the 12 stimuli involving fronting in corrective exchanges provides some initial support to this hypothesis, as they appear to cluster in two groups, one in the 1.5-3.0 range, assessing fronting as marginally ungrammatical, and the other, less numerous, in the 4.5-5.0 range, assessing fronting as marginally grammatical.

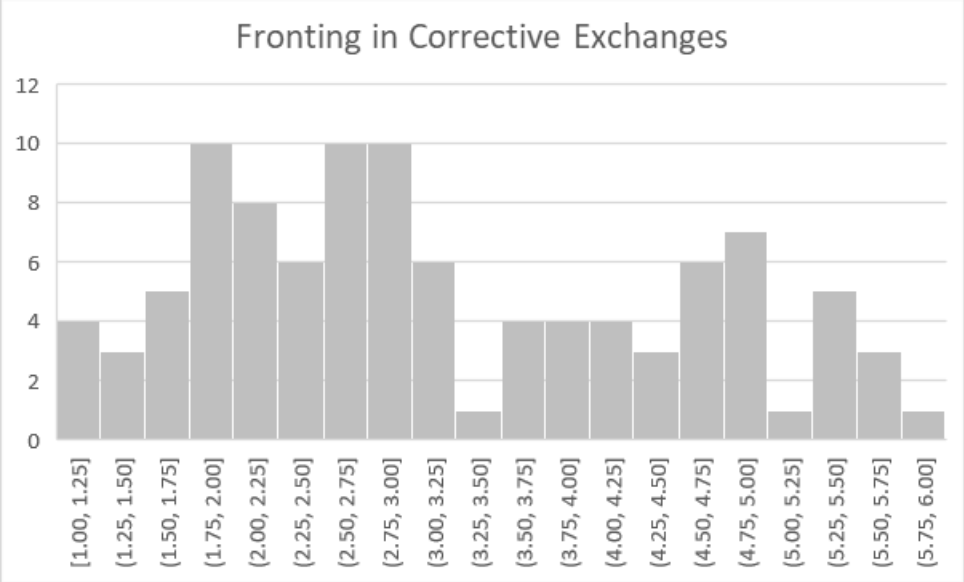

Figure 5: Number of participants with similar mean value for the 12 stimuli involving fronting under corrective exchanges.

As suggested by an anonymous reviewer, the same clusters would also be expected to be absent for the in-situ responses of corrective exchanges, which again would appear to be the case on inspection of the corresponding histogram provided in figure 6.

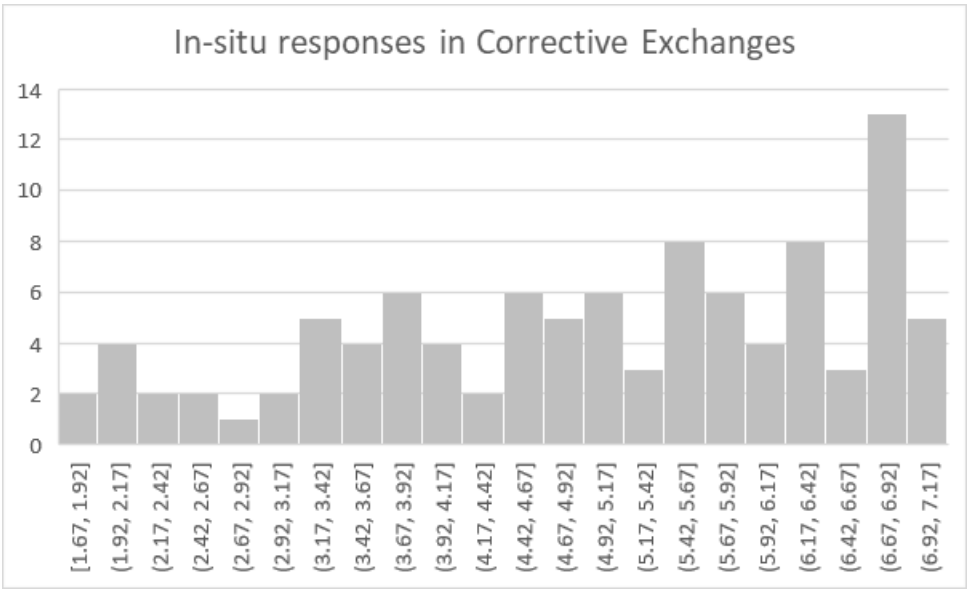

Figure 6: Number of participants with similar mean value for the 12 stimuli involving in-situ responses under corrective exchanges.

The second hypothesis exploits the adverse impact of processing on naturalness assessments discussed in section 4.1 above. Corrective exchanges are the most processing intense amongst those tested because corrections require speakers to withdraw the proposition being corrected from the Common Ground and replace it with a new correct one (van Leusen 2004). If processing effort adversely affects naturalness judgements, then it would affect the judgements for corrective exchanges the most due to their heavier processing load, providing a potential explanation for the observed low grammaticality judgements when compared with the other exchanges. If this effect is real, it should be controlled for during the experiment design phase with the goal of teasing apart the effects of processing from those of grammaticality. Adding stimuli that are certainly ungrammatical while less likely to involve heavy processing would provide a helpful point of comparison.

Finally, let us consider question (iii), concerning the analyses of contrast in Krifka (2008) and Neeleman and Vermeulen (2012). The experimental results appear only partially informative. On the one hand, focus fronting appears most natural in closed question exchanges, a result that taken in isolation supports the definition of contrast in Neeleman and Vermeulen (2012), since only their definition allows for contrast – and hence optional fronting – to be licensed in these exchanges for the reason explained in section 1. Furthermore, in the discussion of question (i) above we saw how Neeleman and Vermeulen's analysis can combine with Skopeteas and Fanselow's (2011) insights to provide an account for the occurrence of fronting in open questions exchanges.

However, even Neeleman and Vermeulen's analysis maintains that contrast is present in corrective exchanges, a fact not confirmed by the experimental results. As discussed above in relation to question (ii), only a better understanding of the linguistic factors determining this outcome will determine whether Neeleman and Vermeulen's hypothesis remains valid, or whether it should be partly revised.

5 Conclusion

This paper reports the results of an experiment concerning the grammaticality of focus fronting in corrective and open/closed question exchanges in British English, while controlling for prosody as well as verbal tense and argument type (DP/PP, animate/inanimate).

Collectively, the 101 participants assessed (i) in-situ focalization as more natural than fronting across all exchanges, (ii) fronting in response to closed questions as more natural than under open questions, and (iii) fronting in response to open questions as more natural than in corrective statements. As explained in section 4, there are reasons to interpret these results as potential evidence for (i) an in-situ analysis of contrastive focalization, (ii) the availability of contrast-induced fronting even in response to open questions whenever speakers wish to convey a contrastive interpretation as per Skopeteas and Fanselow (2011), (iii) the definition of contrast proposed by Neeleman and Vermeulen (2012) where contrast conveys the denial of one of the alternative propositions evoked by focalization, and, finally, (iv) the potential adverse effect of processing loads on grammaticality assessments.

Our experiment also demonstrates the importance of running empirical tests even for widely held assumptions, such as the assumption that focus fronting is less grammatical in response to open questions than in corrective exchanges, an assumption refuted by our results.

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