Stress Shift, Focus, and Givenness in Czech

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This paper is concerned with the prosodic expression of information structure in Czech. We investigate the issue of stress shift, which we understand as a deviation from the default (rightmost) sentence stress realization. Stress shift can be motivated by focus (e.g., Junghanns and Lenertová 2007) or givenness (Šimík and Wierzba 2015). In this paper, we put forth a new generalization, the stress shift generalization in (1), illustrated by the schemas in (2), where b > c indicates that (2b) is more acceptable than (2c) (F-subscript indicates focus, boldface — stress, underlining — givenness).

(1)   *Stress shift generalization*
      Stress shift to focus is more acceptable than stress shift merely
      away from a given element.
(2)   b > c
      a.   X Y **Z**   *default stress*
      b.   X [**Y**]$_F$ <u>Z</u>   *stress shift to focus*
      c.   [X Y <u>**Z**</u>]$_F$ *stress shift away from a given element*

If correct, the generalization supports the view that focus and givenness are in principle independent of each other (contra Wagner 2012, pro

Stevens 2013). We argue that the generalization is captured by the newly proposed STRESS FOCUS RIGHTMOST constraint in (3), which is a more specific version of the classical STRESS FOCUS constraint (which merely requires stress to be in focus). In case of narrow focus on a single word SF and SFR collapse in predictions with respect to sentence stress. In case of a larger focus domain however, SFR explicitly predicts that sentence stress falls to the rightmost element in the focus while SF remains unspecific with respect to the actual position of the sentence stress.

(3)   STRESS FOCUS RIGHTMOST (SFR)
        Sentence stress is realized on the rightmost element of the focus of
        the sentence.

The paper is organized as follows. Section 1 provides the necessary theoretical background and introduces the core notions discussed in this paper. In section 2, we discuss three experiments that motivate the stress shift generalization. In section 3, we show how the generalization is accounted for by the SFR constraint and how "standard" accounts of stress assignment fail. Section 4 reports on a new experiment that we conducted in an attempt to further support the stress shift generalization. Section 5 concludes and provides an outlook on how the present experimental design could be improved.

1   Theoretical Background

1.1   General Assumptions
We assume that the grammar generates multiple convergent structures for a single meaning. These structures are ⟨o, p, i⟩ triples — information about word order (o), prosody (p), and information structure (i) — which are evaluated with respect to how well they conform to a set of constraints. These constraints encode preferences for certain word orders and prosodic patterns, often in relation to information structure (IS). (In our view, IS constraints are post-syntactic; see, e.g., Fanselow 2006, Horváth 2010.) We depart from standard Optimality Theory (Prince & Smolensky 1993/2002) by assuming that the evaluation system assigns a numerical value to each of the structures, representing the degree to which they satisfy/violate the constraints (rather than selecting a single

optimal output). The empirical correlate of the numerical value is the (mean) acceptability of the structure as judged by (a large number of) native speakers. This implies that each constraint is associated with a certain numerical value (subject to language variation), called "weight", representing the level of acceptability decrease upon its violation. This comes close to the Linear OT of Keller (2000) (see Šimík and Wierzba 2015 for more information and a practical application). We adopt this system because it allows us to capture two empirical effects commonly associated with IS-related manipulations: optionality (multiple structures can be equally acceptable) and gradience in acceptability (structure s_1 can be less acceptable than s_2, which in turn can be less acceptable than s_3).

1.2 Core Prosodic and IS Notions and Constraints

We understand **sentence stress** (sometimes simply called **stress** in this paper) as the most prominent phrasal stress in an intonation phrase (Chomsky & Halle 1968, Selkirk 1995, Truckenbrodt 2006). As argued by Daneš (1957:63), sentence stress in Czech falls by default on the rightmost element that carries phrasal stress. Following the spirit of Chomsky & Halle (1968) and many others since then (see Truckenbrodt 2012 for an overview), one can capture this default rule by the somewhat simplified NUCLEAR STRESS RULE constraint in (4).

(4)   NUCLEAR STRESS RULE (NSR)
        Sentence stress is realized on the rightmost element of the
        sentence.

Stress shift characterizes a situation where the NSR is violated, i.e., where a non-rightmost element carries the stress. The term is metaphorical and should not be understood literally: there is no stress shifting operation in the sense of moving stress from one place to another. We simply assume that stress is assigned (potentially differently in different structures representing a single meaning) and the assignment either does or does not conform to the NSR (and other constraints).

The view of information structure (IS) adopted here corresponds, by and large, to the one succinctly summarized in Krifka (2008). We will need two IS notions: focus and givenness. Following the tradition of Rooth (1985, 1992), we assume that **focus** indicates alternative

denotations relevant for the interpretation of utterances. This general IS category underlies various focus "uses", including answerhood focus and contrastive/corrective focus – the two types of uses relevant here and illustrated in (5).

(5)   A: What did you order? / Did you order a pizza?
        B: (No,) <u>I ordered</u> [**pasta**]$_F$.

Focus interacts primarily with prosody in Czech. As explicitly formulated by Daneš (1959:8), focus always contains sentence stress (in the formal literature, this generalization originates with Chomsky 1971 and Jackendoff 1972). This so called stress-focus correspondence can be modeled by the STRESS FOCUS constraint in (6). As already indicated above, we will propose to replace the SF by the more specific SFR.

(6)   STRESS FOCUS (SF)
        Sentence stress is realized in the focus of the sentence.

Following the spirit of Schwarzschild (1999), we assume that an element A is **given** if there is another element B in the preceding discourse, such that B is semantically identical to A (for referential expressions) or the existential closure of B entails the existential closure of A (for function-denoting expressions). In (7B), the phrase *baked it* is given (due to the presence of *baked the cake* in (7A)), as are the words *baked* and *it* individually.

(7)   A: I doubt that Sue baked the cake.
        B: I heard that **Paul** <u>baked it</u>.

Relying on the experimental results of Šimík and Wierzba (2015), we take givenness to interact primarily with prosody in Czech. In particular, given elements are typically stressless (this was noted as early as in Petřík 1938:132–133 for Czech; precedents for English and German are Schmerling 1976, Ladd 1980, and Féry & Samek-Lodovici 2006).[1] The

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[1] Note that given constituents are not exclusively stressless (which is why we associate givenness with the lack of sentence stress rather than stress in general, contra Féry & Samek-Lodovici 2006). Prefocal given constituents may carry stress in German, though in a slightly compressed pitch register (Féry & Kügler 2008). Or given constituents are

stresslessness-givenness correspondence is captured by the *STRESS GIVEN constraint in (8).

(8)   *STRESS GIVEN (*SG)
       Sentence stress is not realized in a given element.

1.3   Ways of Motivating Stress Shift
Both focus and givenness — or more precisely, the need to satisfy SF (SFR) and *SG, respectively — can motivate stress shift in Czech. This assumption is very common for focus (originally Trávníček 1937, Mathesius 1941, Daneš 1957, more recently Junghanns and Lenertová 2007); the existence of stress shift away from a given element is certainly less established but was recently experimentally confirmed in Šimík and Wierzba (2015). Since the background to focus is typically given, the two motivations often go hand in hand. This is illustrated in (9), where stress shift in (9B₁) leads to the joint satisfaction of both SF and *SG, while default stress in (9B₂) leads to their joint violation. (We indicate violated constraints at the right margin.)

(9)   A: Who ordered the pizza?
       B₁: [**Bruce**]_F ordered the pizza.
       B₂: [Bruce]_F ordered the **pizza**.   *SF, *SG*

If we were to isolate the effect of SF, we would have to consider examples where stress shifts to a focus, but away from a non-given (new) background, as in (10B₁). Isolating the effect of *SG involves shifting the stress to an element that is not itself focused (but rather is just part of the focus), as in (11B₁). The failure to shift the stress results in a SF and *SG violation, respectively, as in (10B₂) and (11B₂).

(10)   A: What surprised you the most at the reception?
       B₁: That only [**Paul**]_F wore a bowtie.
       B₂: That only [Paul]_F wore a **bowtie**.   *SF*

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realized with a less prominent pitch accent in case of a sentence containing only a single pitch accent (Baumann et al. 2015).

(11)   A: Do you still enjoy living in your big house?
       B₁: [Sometimes I just feel like **selling** the house]_F.
       B₂: [Sometimes I just feel like selling the **house**]_F.   *SG

Our data single out the effect of givenness (*SG) by showing that stress shift away from a given element, as in (11), is less acceptable than stress shift jointly motivated by focus and givenness, as in (9). We will show how this follows from the newly proposed constraint STRESS FOCUS RIGHTMOST, which is violated in (11B₁), but not in (9B₁). (The case in (10) is not investigated in our paper; however, the SFR-based account makes the prediction that stress shift in this case would be as acceptable as in (9).)

2   Initial Evidence for the Stress Shift Generalization

In this section, we briefly discuss the results of three experiments, which jointly motivate the stress shift generalization (1). The first two show that stress shift to a focused element (e.g., **S**VO) is just as acceptable as alternating word order and placing default stress on the focused element (e.g., OV**S**). The third experiment shows that stress shift away from a given object (**V**O) is less acceptable than alternating word order and assigning default stress (O**V**).

2.1   Stress Shift to Focus

The first experiment described here — call it the S-focus experiment — has not yet been published. It was part of the filler items of the experiment reported on in Šimík, Wierzba, and Kamali (2014). There were 44 participants, all students at the Palacký University in Olomouc, and their task was to rate the acceptability of utterances in a context (on a 1–9 scale, 9 acceptable). The target sentences involved a focused+stressed subject in two different positions (the WORD ORDER/STRESS POSITION factor): clause-initial (**S**_F VO) and clause-final (OV**S**_F).[2] The former condition involves stress shift, the latter default

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[2] Two factors in addition to WORD ORDER/STRESS POSITION were manipulated in this experiment: CONTEXT TYPE (wh-question vs. yes-no question with an indefinite corresponding to the wh-word) and STRESS TYPE (higher vs. lower pitch), resulting in a 2x2x2 within-items design. The additional factors showed no effect (both $ps > 0.4$) and are therefore ignored.

stress. Focus was manipulated contextually, stress acoustically (the experiment was presented auditively). One item set (out of the total 32) is illustrated in (12). The target in (12B₁) involving stress shift is as acceptable as the target with default stress (12B₂).

(12)   B₁ ≈ B₂
   A: Kdo pil   ten   den alkohol?
     who   drank that   day alcohol
     'Who drank alcohol on that day?'
   B₁: *Stress shift*
     [Josef **Němec**]_F pil   ten   den alkohol.
      Josef Němec   drank that   day alcohol
   B₂: *Default stress*
     Alkohol   pil   ten   den [Josef **Němec**]_F.
     Alcohol   drank   that   day   Josef Němec
     'Josef Němec drank alcohol on that day.'

The mean rating for the SVO condition was 7.46 (SD 2.04) and for the OVS condition 7.60 (SD 1.87). The WORD ORDER/STRESS POSITION factor had no effect ($p = 0.35$ according to ANOVA), suggesting that there is no preference of sentence stress position in case a narrowly focused element is stressed. In other words, stress shift to focus is as acceptable as default stress on focus in Czech.[3]

  Groeben (2015) conducted an extension of the S-focus experiment —the narrow focus experiment—enriching the WORD ORDER/STRESS POSITION factor by one level (yielding three levels: initial, medial, and final focus+stress) and adding the CATEGORY factor (three levels: focus+stress on subject, verb, and object), resulting in a within-items design with a total of 9 conditions (3x3). The experiment consisted of 36 target items and 72 fillers. The target items were constructed in a similar way to the S-focus experiment (but used contrastive/corrective instead of answerhood focus). All the conditions were rated with means between 6 and 7 (9-point scale), exhibiting insignificant or marginally significant

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[3] We agree with an anonymous reviewer that it is difficult to draw inferences from a null result. What is important, however, is that this null result is compatible with our hypothesis. Some readers might find it relevant that there were other conditions in the overall experimental design (e.g., such that violated *SG), which, expectedly, were rated significantly lower than those in (12); see Šimík, Wierzba, and Kamali 2014.

differences (attributable to independent factors). See Groeben 2015 for details. The narrow focus experiment further corroborated the assumption that stressed narrow focus can be placed in any sentence position (independently of the stressed category).

2.2   Stress Shift away from a Given Element

Šimík and Wierzba (2015) investigated stress shift in a broad focus environment. In their experiment (exp. 1, call it the O-given experiment), the whole clause—represented here by the minimally present VP—was focused. The VP always consisted (at least) of a verb and an object, the latter of which was given. The experiment involved three factors (each with two levels): WORD ORDER (VO vs. OV), STRESS (stress on V vs. stress on O), and DEFINITENESS (definite O vs. indefinite O). Stress was manipulated acoustically, information structure (givenness) and definiteness were manipulated contextually. Example (13) shows one of the 40 item sets (for the indefinite O condition). Here stress shift (B_1) is less acceptable than default stress (B_2).

(13) $B_1 < B_2$

A: Na trhu   prý   mají čerstvé lososy.
   At market report.part have fresh   salmon.pl
   'Reportedly, they have fresh salmon at the market.'

B_1: *Stress shift*
   [Tak to   bychom   mohli zítra   **poobědvat**
     so   then subj.1pl could tomorrow   eat.for.lunch
   lososa]_F.
   salmon

B_2: *Default stress*
   [Tak to   bychom   mohli zítra   lososa
     so   then subj.1pl could tomorrow   salmon
   poobědvat]_F.
   eat.for.lunch

B_3: [Tak to   bychom   mohli zítra   poobědvat
        so   then subj.1pl could tomorrow   eat.for.lunch
   lososa]_F.
   salmon

B₄: [Tak to   bychom   mohli zítra   **lososa**
       so   then subj.1pl   could tomorrow   salmon
       poobědvat]_F.
       eat.for.lunch
       'So tomorrow we could have a salmon for lunch.'

Conditions (13B₃) and (13B₄) violate *STRESS GIVEN and were significantly less acceptable than the other two. The critical conditions for us are in (13B₁) and (13B₂), which differed significantly in acceptability: the stress shift condition (13B₁) was less acceptable than the default stress condition (13B₂). In other words, stress shift is less acceptable than default stress when the stressed category is not focused but only part of focus.

3   Analysis

The above findings are summarized in (14) and (15). Concisely expressed, stress shift leads to an acceptability decrease only if the stressed category is not (narrowly) focused. Another way of looking at the generalization is to say that stress shift is penalized only if it happens within broad focus (in order to satisfy *STRESS GIVEN). In (14) stress shift (a) is as acceptable as default stress (b), whereas in (15) stress shift (a) is less acceptable as default stress (b).

(14)   *Stress on +focus:* $\boxed{a \approx b}$
        a.   [**X**]_F Y̲   *stress shift*
        b.   Y̲ [**X**]_F   *default stress*

(15)   *Stress on –focus:* $\boxed{a < b}$
        a.   [**X** Y̲]_F   *stress shift*
        b.   [Y̲ **X**]_F   *default stress*

The newly proposed STRESS FOCUS RIGHTMOST (SFR), repeated in (16) for convenience, captures this generalization nicely: limiting our attention to (14) and (15) above, the only condition where it is violated is (15a), where stress is not placed on the rightmost element of the focus. This correctly captures its reduced acceptability. Notice that the SFR is

satisfied trivially in (14), where the rightmost element of the focus is the focus itself.

(16) STRESS FOCUS RIGHTMOST (SFR)
      Sentence stress is realized on the rightmost element of the focus of the sentence.

In contrast, "standard" theories of sentence stress have no way of accounting for the generalization. First, it is clear that STRESS FOCUS (SF) and *STRESS GIVEN (*SG) play no role here because they are satisfied in all of the conditions: the focused element always contains sentence stress and the given element never does so. Consider now the NUCLEAR STRESS RULE (NSR). Opinions differ as to whether (14a) and (15a) violate the NSR. Proponents of what we could call a "strict" NSR would answer in the affirmative: in (14a)/(15a), stress is simply not rightmost, hence the NSR is violated (Chomsky & Halle 1968). Proponents of what we could call a "relaxed" NSR take destressing into account: what counts for the NSR is not the rightmost element, instead, what counts is the rightmost (phrasally) *stressed* element (e.g. Zubizarreta 1998, Truckenbrodt 2012, Féry 2013). Hence, if Y in (14a)/(15a) is stressless (as it is in the previously mentioned experiments), then the NSR is satisfied. The strict NSR predicts (14a) and (15a) to be less acceptable than (14b) and (15b), respectively, and the relaxed NSR predicts no acceptability contrast whatsoever because it is satisfied everywhere — the wrong result in either case.

4 The Stress Shift Experiment

4.1 Motivation

The empirical underpinnings of the stress shift generalization (1) and the newly proposed SFR designed to account for it are not as solid as one would wish. First, the crucial factor (stress shift to focus vs. away from a given element) was manipulated across experiments rather than within a single experiment. Second, there is a potential confound that needs to be ruled out, namely the category to which stress shifts. In the S-focus experiment, the stressed category was the subject (an argumental category), whereas in the O-given experiment of Šimík and Wierzba (2015), the stressed category was the verb (a predicative/functional category). Groeben's (2015) narrow focus experiment confirmed that

stress shift to focus is equally acceptable, independently of the stressed category (S, V, and O). What remains unclear, though, is the acceptability of stress shift away from a given element to a non-verbal category. With our present knowledge, we cannot rule out the possibility that stress shift away from a given element leads to an acceptability decrease just in case the stressed category is verbal (non-argumental), in which case the SFR is too general.

The above-mentioned problems motivate conducting a new experiment — the stress shift experiment. In this experiment, we include stress position (default vs. shifted) as a factor, eliminating the first problem. In addition, we manipulate the type of category stressed (verb vs. object), eliminating the second problem.

4.2   Design

We used a 2x2x2 within items design. Each of the three factors had two levels: The category of the element being stressed (CATEGORY STRESSED) with the levels object and verb, the focus status of the element carrying main stress (FOC-STATUS) with the levels +focus and −focus, and the position of main stress (STRESS POSITION) with the levels default stress and stress shift. Taken together, this resulted in eight conditions. These eight conditions are schematically presented in Table 1 including their word order. Recall that the element carrying main stress is written in boldface, given elements are underlined, and focus is marked by an F-subscript.

	CONDITION	CATEGORY STRESSED	FOC-STATUS	STRESS POSITION
a.	$\underline{\text{S V XP}}$ [**O**]$_F$	object	+focus	default
b.	$\underline{\text{S V}}$ [**O**]$_F$ $\underline{\text{XP}}$	object	+focus	stress shift
c.	[S V $\underline{\text{XP}}$ **O**]$_F$	object	−focus	default
d.	[S V **O** $\underline{\text{XP}}$]$_F$	object	−focus	stress shift
e.	$\underline{\text{S O XP}}$ [**V**]$_F$	verb	+focus	default
f.	$\underline{\text{S}}$ [**V**]$_F$ $\underline{\text{O XP}}$	verb	+focus	stress shift
g.	[S O XP **V**]$_F$	verb	−focus	default
h.	[S **V** $\underline{\text{O XP}}$]$_F$	verb	−focus	stress shift

Table 1: Presentation of a schematic item in all eight conditions

All target sentences consisted of four constituents: a subject, an object, a verb, and an additional phrase (XP), which included indirect objects, prepositional objects, or predicational small clauses. All items shared the property of having the canonical (unmarked) order SVOXP (according to the intuition of the second author).

The target sentences had different word orders, depending on the condition they represent. The sentences with default stress (stress on the rightmost element) have a non-canonical word order. As far as givenness is concerned, in the +focus conditions all elements except the stressed one were given (individually as well as together). By contrast, in the −focus condition, only the XP is given in the object-stressed condition and the XP plus the object are given in the verb-stressed condition. The differential size of the given part results as a trade-off of the constant number and order of sentential constituents.

Two of these eight conditions violate the SFR. These are the −focus-conditions involving stress shift, i.e., condition (d) for main stress on the object and condition (h) for main stress on the verb.

An example item is shown in all eight conditions in (17) to (20) (the letters correspond to those in the table). In (17) and (18) the conditions with stress on the object are presented (+focus in (17) and −focus in (18)). The examples (19) and (20) show the four conditions with stress on the verb (+focus in (19) and −focus in (20)). Note that the target sentences for (17) and (18) and for (19) and (20) are the same (the same recording was used for them); they only differ in the context.

(17) Q: Přiměla Marie Václava k odchodu?
          'Did Marie convince Václav to leave?'
      a. <u>Marie přiměla   k odchodu</u> **Jiřího**.
          M.$_{NOM}$ convinced to leaving   J.$_{ACC}$
          'Marie convinced Jiří to leave.'
      b. <u>Marie přiměla</u> **Jiřího** <u>k odchodu</u>.
(18) Q: Nevíš, jestli už všichni odešli?
          'Do you have an idea if everyone left yet?'
      c. Marie přiměla   <u>k odchodu</u> **Jiřího**.
          M.$_{NOM}$ convinced to leaving   J.$_{ACC}$
          'Marie convinced Jiří to leave.'
      d. Marie přiměla **Jiřího** <u>k odchodu</u>.

(19) Q: Vyzvala Marie Jiřího k odchodu?
          'Did Marie ask Jiří to leave?'
      e. <u>Marie   Jiřího k   odchodu</u> **přiměla**.
          M._{NOM} J._{ACC} to leaving   convinced
          'Marie convinced Jiří to leave.'
      f. <u>Marie</u> **přiměla** <u>Jiřího k odchodu</u>.
(20) Q: Nevíš, proč Jiří odešel?
          'Do you have an idea why Jiří left?'
      g. Marie   <u>Jiřího k   odchodu</u> **přiměla**.
          M._{NOM} J._{ACC} to leaving   convinced
          'Marie convinced Jiří to leave.'
      h. Marie **přiměla** <u>Jiřího k odchodu</u>.

4.3   Method and Procedure

The stress shift experiment is similar in design to the ones described in section 2. It involves acceptability ratings of auditorily presented utterances in a context. Each stimulus forms a short dialog, consisting of a context question read by a female speaker and an answer read by a male speaker, both Czech native speakers.

We used a within-subjects design and the items were presented in a Latin-square design, so that each participant saw each item in only one condition. The experiment consisted of 32 test items and 64 filler items, which were chosen with regard to their expected acceptability to receive a balance between acceptable and unacceptable items.

32 native-speaker students from Olomouc participated. Each of them was paid a small fee for participation and the experiment took around 30 minutes, depending on their individual pace. During the experiment each participant sat in front of a computer screen on which they were presented an introduction to the experiment (in Czech). A familiarization phase contained two example items, one of which was acceptable and the other one unacceptable.[4]

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[4] The two example items formed a minimal pair designed to indicate that "unacceptability" corresponds to strange word order and strange prosody (rather than utter ungrammaticality or strange content), without revealing the crucial manipulated factors. The "acceptable" item was of the form <u>SV</u>[**PP**]_F and the "unacceptable" item was of the form <u>V</u>**S**[PP]_F.

The examples could be listened to twice, if the participants wanted, whereas the test-items could have been listened to only once. To start the experiment, the participants had to press space-bar and the first item started to play. After having played the item, a scale from 1 (totally unacceptable) to 9 (totally acceptable) appeared and the participants rated the acceptability of the item they have heard with respect to its context (by pressing a number key on the non-numerical keyboard). To start the next item, the participants had to press space-bar again. In addition to the ratings, reaction times were measured (not systematically analyzed here).

4.4   Predictions
According to the SFR, the +focus-conditions should be rated as equally acceptable independently of the position of main stress. For the −focus-conditions, in contrast, the SFR predicts significant differences between stress shift and default stress for both the object- and the verb-conditions. In particular, stress shift is expected to be less acceptable than default stress.

4.5   Results
The mean scores and standard deviations for each condition are listed in Table 2.

	CONDITION	CATEGORY	FOC-STATUS	STRESS POS.	MEAN	SD
a.	S V XP [**O**]$_F$	object	+focus	default	7.9	1.36
b.	S V [**O**]$_F$ XP	object	+focus	stress shift	7.3	1.86
c.	[S V <u>XP</u> **O**]$_F$	object	−focus	default	5.9	2.58
d.	[S V **O** <u>XP</u>]$_F$	object	−focus	stress shift	4.9	2.41
e.	<u>S O XP</u> [**V**]$_F$	verb	+focus	default	7.1	2.11
f.	<u>S</u> [**V**]$_F$ <u>O XP</u>	verb	+focus	stress shift	7.2	1.87
g.	[S <u>O XP</u> **V**]$_F$	verb	−focus	default	6.7	2.31
h.	[S **V** <u>O XP</u>]$_F$	verb	−focus	stress shift	6.3	1.94

Table 2: Means and standard deviations of the ratings for each condition

We fit a multilevel model (Bates et al. 2013) using crossed random
factors participant and item applying random intercepts, and FOC-STATUS
(with levels −focus/+focus) and STRESS POSITION (with levels default
stress/stress shift) as fixed factors. The analysis relied on the
acceptability ratings as a dependent variable. Treatment-coding was
applied using level −focus of the factor FOC-STATUS as baseline, and
level default stress of the factor STRESS POSITION as baseline. As shown
in Table 3, the model reveals an effect of FOC-STATUS (+focus more
acceptable than −focus) and the interaction (default stress more
acceptable than stress shift, but only in −focus conditions).

	Estimate	SE	t value	sign.
(Intercept)	6.7344	0.2007	33.55	*
FOC-STATUS = +focus	−0.6367	0.1835	−3.47	*
STRESSPOS = stress shift	0.1641	0.1835	0.89	n.s.
Interaction	0.6289	0.2596	2.42	*

Table 3: Report of the linear mixed effects model specified in the text
with acceptability ratings as dependent variable

A post-hoc pairwise t-test further reveals that the interaction between
FOC-STATUS and STRESS POSITION can only be attributed to the items
with a stressed object. In particular, for the −focus-conditions with stress
on the object (conditions (c) and (d)) the difference in acceptability
between stress shift and default stress was found to be significant (t =
3.1; p = 0.003), but not so for the items with stress on the verb (t = 1.5; p
= 0.60).

4.6   Discussion
Our results are partly consistent with the predictions from the SFR. For
the +focus-conditions no significant differences were found between
stress shift and default stress, and for the −focus-conditions with stress
on the object this difference was found to be significant. However, for
the −focus-conditions with stress on the verb the difference between
stress shift and default stress was not significant. This part of our results
doesn't support the SFR and is at odds with the findings of Šimík and
Wierzba (2015), who found a significant difference between stress shift
and default stress in a condition corresponding to our −focus verb-
condition (see section 2.2). We hypothesize that the lack of the expected

effect in our experiment could be due to focus accommodation. It is possible that our contextual manipulation of the focus factor in the verb condition might not have been entirely successful: the participants could have treated −focus conditions as if they were +focus-conditions. In our design, example (21) (repeated from (20)) is a representative of broad focus (and hence, −focus on V). If, however, the participants parsed (21A) as having focus on the stressed verb (rather than on the whole sentence), they had no reason to assign a penalty to the stress shift.

(21) Q: Nevíš, proč Jiří odešel?
          'Do you have an idea why Jiří left?'
      A: [Marie **přiměla**   Jiřího k   odchodu]$_F$.
            M.$_{NOM}$ convinced J.$_{ACC}$ to   leaving
          'Marie convinced Jiří to leave.'

As Šimík and Wierzba (2015) have shown, focus accommodation does, in fact, facilitate stress shift. Within several post-hoc analyses of their results, they found an "influence of contrast [= focus] in that the acceptability of stress shift is raised when a contrastive interpretation is more likely" (Šimík and Wierzba 2015, 3:59).

    There are two reasons to believe that focus accommodation is responsible for the relatively high rating of stress shift to the verb in the −focus-conditions. First, we used contrastive stress in the recordings (the recordings of the target sentences were reused from Groeben's 2015 experiments, which only involved contrastive focus). Second, the size of the given part was larger for the items with stress on the verb than for the items with stress on the object in the −focus-conditions. In the −focus-sentences with stress on the object only the XP was given, whereas in those with stress on the verb the XP and the object were given. It is possible that the larger the given part, the more likely it is to be interpreted as a background to the stressed constituent, ultimately rendering the stressed constituent focused.[5]

    More evidence for our focus accommodation conjecture could in principle be drawn from reaction times. As demonstrated by Haviland &

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[5] This would also explain the discrepancy between the present findings and the findings of Šimík and Wierzba (2015), who did find a penalty of stress shift in comparable −focus conditions: Šimík and Wierzba used VO/OV items with no constituent corresponding to our XP; O was the only given constituent.

Clark (1974), accommodation takes time. We would therefore expect the participants to take longer to rate the stress shift −focus verb-condition (where focus accommodation takes place, by hypothesis) than the default stress −focus verb-condition (where no accommodation is required). An analysis of the reaction times reveals a tendency in the right direction – rating the former condition took longer (mean: 4153ms) than rating the latter condition (mean: 3771ms) — but the difference is not significant (t = 0.81, p = 0.41).

5   Conclusion and Outlook

We formulated a new generalization about stress shift in Czech, namely that stress shift to focus is more acceptable than stress shift away from a given element. We argued that this generalization cannot be captured by the standard toolbox used for analyzing sentence prosody — the constraints NUCLEAR STRESS RULE (NSR), STRESS FOCUS (SF), *STRESS GIVEN, or their combination — and proposed a new constraint, STRESS FOCUS RIGHTMOST (SFR), which achieves the required effect by penalizing stress shift to an element that is not focused itself but rather is just a non-rightmost subpart of a broader focus. The newly proposed SFR constraint entails the classical SF and makes it obsolete. The stress shift generalization also entails that focus and givenness are independent IS categories (see, e.g., Stevens 2013).

   We conducted an acceptability rating experiment designed to verify the stress shift generalization and, by extension, the SFR that accounts for it. The experiment confirmed our expectations only partly: it proved a decreased acceptability of stress shift away from a given element (relative to stress shift to focus) for the case of stressed object but not stressed verb. Our failure to find the expected effect in the verb-condition could be due to focus accommodation: if the stressed –focus verb was — contrary to the intentions of the experimental design — interpreted as focused, shifting the stress to it produced a relatively acceptable result. We discussed a number of independent reasons why focus accommodation might have taken place in the stress shift verb-condition.

   There are a number of ways in which the present experimental design could be improved in order to produce stronger and more reliable results. First, the phonetic stress realization should be more neutral, in order for it to be compatible with non-contrastive focus (the present

experiment involved contrastive stress). Second, the type of focus use should be unified across the +focus and –focus conditions (the present experiment involved contrastive/corrective focus in the +focus (narrow focus) condition and information focus in the –focus (broad focus) condition). Third, the size of the given part should be unified across the levels of the CATEGORY factor (the present experiment involved XP-givenness in the object-condition but O+XP-givenness in the verb-condition). Last but not least, the design could be extended in order to test the third logical environment in which stress shift can take place, namely stress shift to focus from a new (non-given) background.

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