If it's difficult to pronounce, it might not be risky
Fluency, risk perception, and random sampling of stimuli

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Introduction

Processing fluency, a metacognitive feeling of ease of processing, is used as a basis for various types of judgment. For example, previous research has shown that people judge food additives with more difficult-to-pronounce (i.e., disfluent) names as more harmful (Song & Schwarz, 2009). In the present study, we originally explored the possibility that the association between processing disfluency and harmfulness might be in the opposite direction for some categories of objects. While we initially found some support for the hypothesis, further studies indicated that the studied effect of processing fluency is largely dependent on the stimuli used. In the last two studies, we explored whether the original fluency–safety association is replicable with newly constructed stimuli.

Method

Studies 1-4: Participants were presented one of four hypothetical scenarios. In all scenarios, they judged dangerousness of 10 objects based only on their names. In the *food additives* scenario (adopted from Song & Schwarz, 2009), participants imagined reading names of food additives on a food label. The *cities in a war zone* and *criminals* scenarios were constructed such that we expected that people would judge easier-to-pronounce names as more dangerous. In *cities in a war zone*, participants imagined traveling through war-stricken Syria and judged dangerousness of cities they traveled through. In *criminals*, participants rated dangerousness of criminals considered for an amnesty. The wording and stimuli of *beach resorts* were the same as for *cities in a war zone*, only "Syria" was replaced by "Turkish Riviera" and beach resorts were rated instead of cities.

Study 5: To explore influence of particular items, we used the original *food additives* scenario items and added 50 new items varying in pronounceability. mTurk workers (616; 572 after exclusion) rated 10 randomly selected items out of the 60 in two new scenarios. The participants imagined that they are searching through archives of a laboratory that researched either poisons or medicines, and judged their harmfulness based on their names.
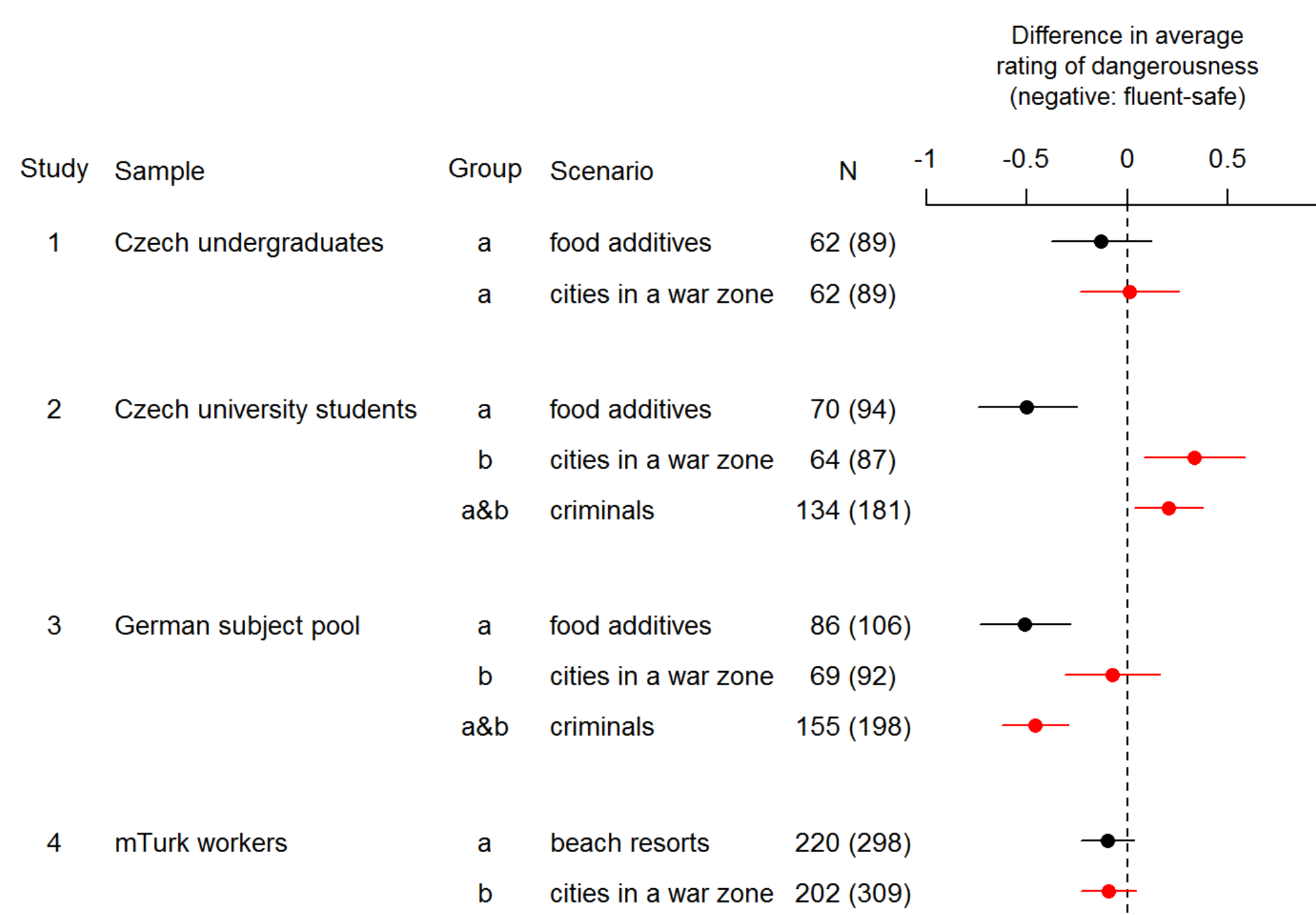
Study 6: The original *food additives* scenario was given to 200 participants (186 after exclusion) from a Czech laboratory sample. Each participant rated 15 items out of the 10 original and 40 newly constructed.
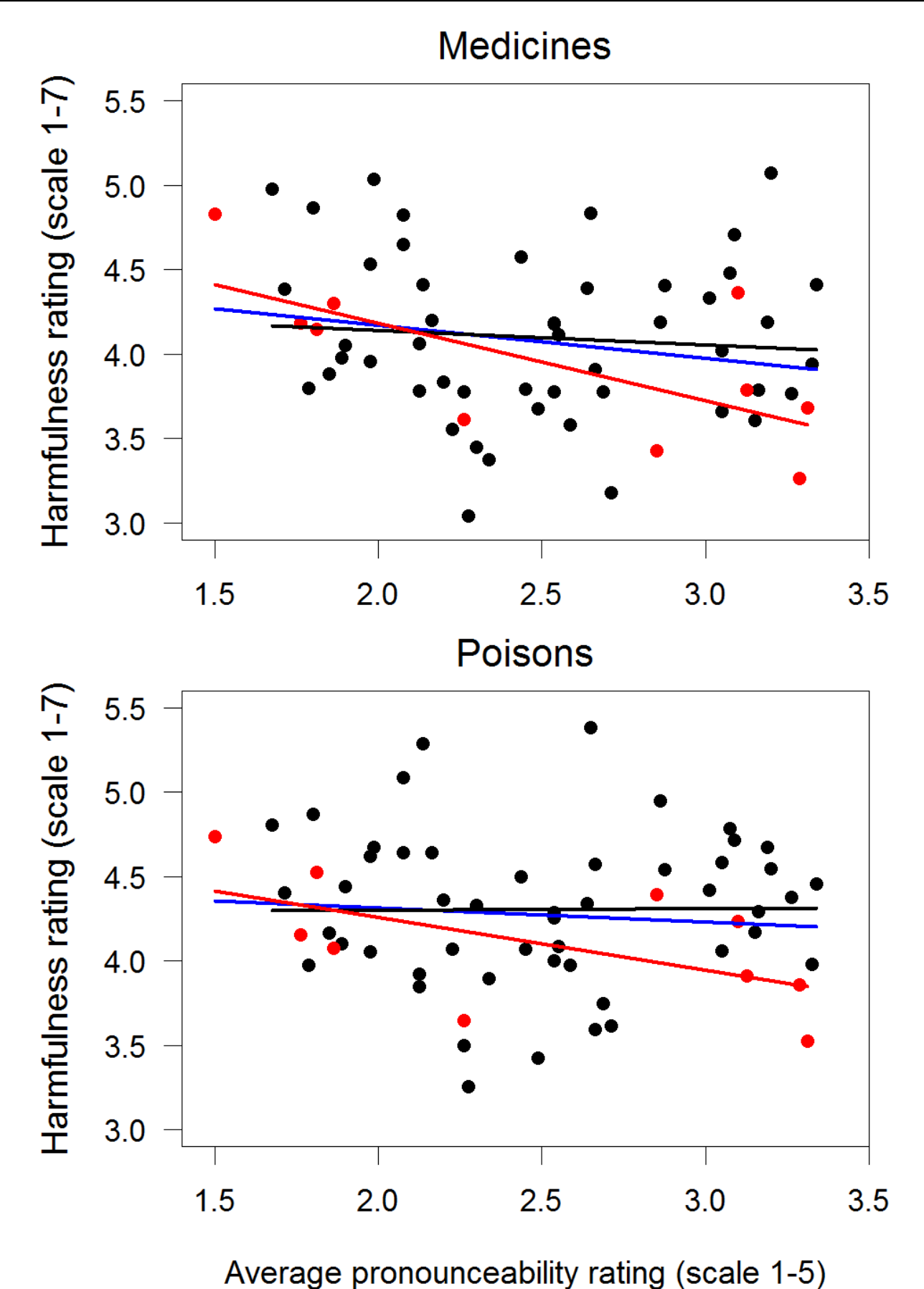
Results

Studies 1-4: We were able to replicate the results of Song and Schwarz (2009) in two studies (2 & 3). While initial studies (1 & 2) suggested that the effect of pronounceability on judgment of dangerousness might be reversed for some categories of objects, we were not able to get the same effect in further studies. In fact, we obtained the effect in the original direction (easily pronounceable – safe; Study 3) even when using the same scenario where we observed the reversed effect in Study 2. Because we changed a few items between studies 2 and 3, a possible explanation is that the effect may be dependent on particular items used. Implications of this explanation for the original effect were tested in studies 5 and 6.

Study 5: Multilevel linear modeling showed a significant pronounceability effect for the original names, b = -0.48, 95% CI = [-0.79, -0.17], but not for the newly constructed names, b = -0.11, 95% CI = [-0.39, 0.16]. The interaction between the category of the object and pronounceability was significant neither for the original nor for the new names.
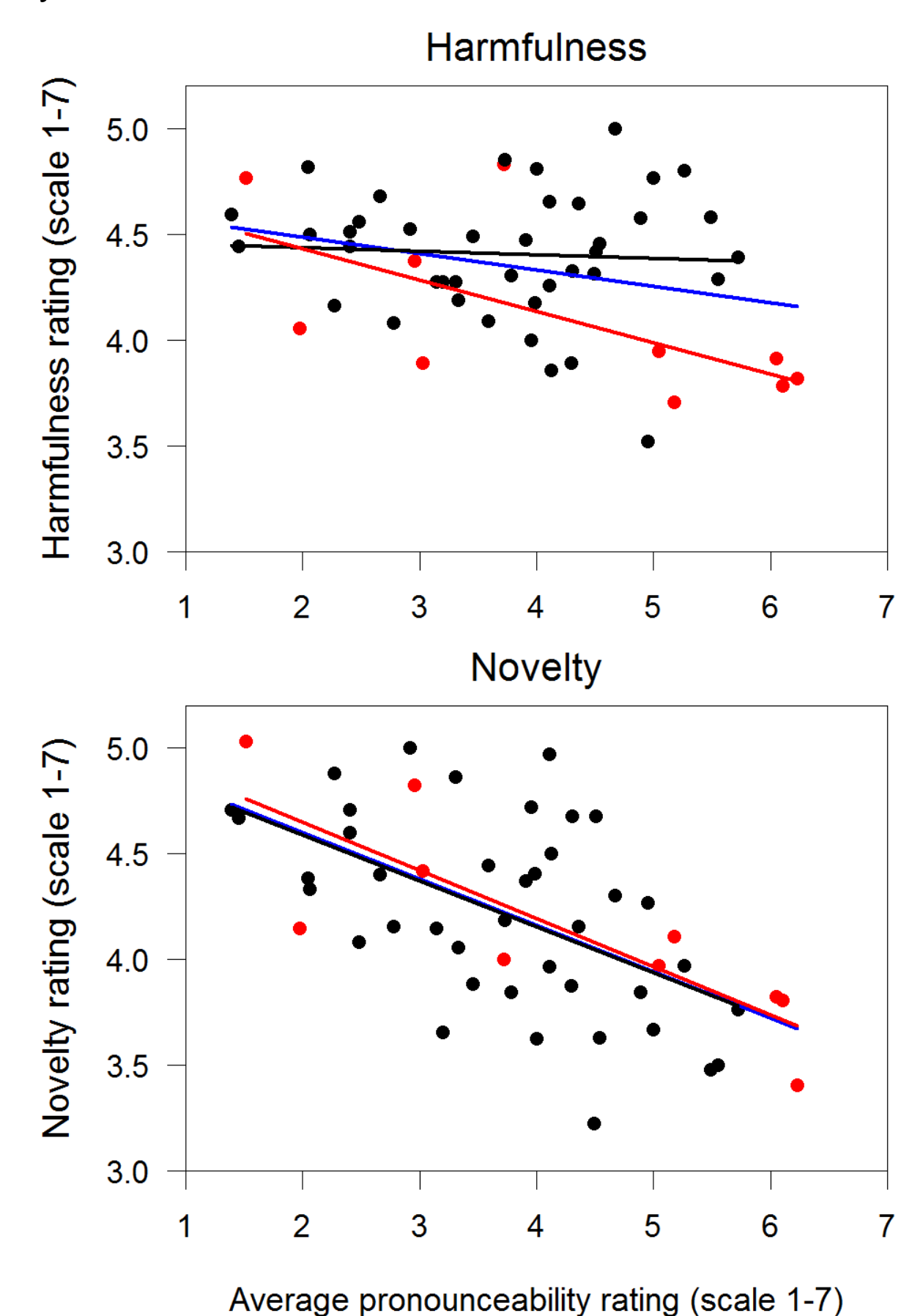
Study 6: The results corroborated the results of Study 5. While participants judged harder-to-pronounce names as more harmful when judging the original names, b = -0.15, 95% CI = [-0.27, -0.04], there was no effect for the newly constructed names, b = -0.03, 95% CI = [-0.11, 0.06]. However, we found that easier-to-pronounce names were judged as less novel for both original names, b = -0.23, 95% CI = [-0.34, -0.12], and newly constructed names, b = -0.20, 95% CI = [-0.31, -0.09].

Medicines / Poisons figures (Harmfulness rating scale 1-7 vs. Average pronounceability rating scale 1-5)

Study 5: The figure shows the association between average pronounceability and harmfulness ratings on the item level. While there is no association for the newly constructed items (**black** points and **black** lines), it is possible to see the original effect for the original items (**red** points and **red** lines). The **blue** lines represent regression lines made using both original and newly constructed names.

Study	Sample	Group	Scenario	N
1	Czech undergraduates	a	food additives	62 (89)
		a	cities in a war zone	62 (89)
2	Czech university students	a	food additives	70 (94)
		b	cities in a war zone	64 (87)
		a&b	criminals	134 (181)
3	German subject pool	a	food additives	86 (106)
		b	cities in a war zone	69 (92)
		a&b	criminals	155 (198)
4	mTurk workers	a	beach resorts	220 (298)
		b	cities in a war zone	202 (309)

Difference in average rating of dangerousness (negative: fluent-safe)

Studies 1-4: In some studies, participants were divided in two separate groups (labeled a and b) and some scenarios were given to both groups (indicated as a&b). Points represent Cohen's d_zs for the average difference in ratings of easy- and hard-to-pronounce names. Lines represent 95% confidence intervals for Cohen's d_z. Negative values of Cohen's d_z mean that easy-to-pronounce names were judged to be less dangerous (i.e. the original association observed by Song & Schwarz, 2009). Effect sizes are displayed in **black** for scenarios where we expected the original association and in **red** for scenarios where we expected the opposite association (i.e. easy-to-pronounce names to be judged as more dangerous). The number of participants before exclusion is provided in parentheses.

Harmfulness / Novelty figures (rating scale 1-7 vs. Average pronounceability rating scale 1-7)

Study 6: The figure shows the effect of pronounceability on harmfulness and novelty ratings on the item level. For harmfulness ratings, there is no effect for the newly constructed names (**black** points and **black** line), but it is possible to see the disfluency-harmfulness association for the original names (**red** points and **red** line). On the other hand, there is a clear effect of pronounceability on judgment of novelty for both original and newly constructed names. The **blue** lines represent regression lines made using both original and newly constructed names.

Conclusions

- We did not find support for our hypothesis that the fluency-safety association may be reversed for some categories of objects.
- We were able to replicate previous findings by Song and Schwarz (2009) using the same stimuli in four studies.
- However, the effect disappeared for newly constructed stimuli.
- The results cast doubt on generalizability of the association of fluency and safety and underscore importance of treating stimuli as a random factor.

Literature cited

Song, H., & Schwarz, N. (2009). If it's difficult to pronounce, it must be risky: Fluency, familiarity, and risk perception. *Psychological Science, 20*, 135-138.

Acknowledgments

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