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| --- | --- | --- | --- | --- |
| slide | section | Text | Questions | Comments |
| 1 | Front | - |  |  |
| 2 | intro - example | How would you describe the difference between the two tones? |  |  |
| 3 | intro - overview metaphors | Many languages conceptualise musical pitch metaphorically in terms of space.  If you speak a Germanic language, you may describe the first sound as *low* and the second as *high*, whereas if you speak Farsi or Turkish, you are more likely to say "*the first was thicker, the second thinner".*  The focus of our study is on the usage of incompatible space-pitch mappings by bilingual speakers of Swedish and Turkish, bimodally in both speech and gesture. |  |  |
| 4 | intro - bilingualism | ----  Research question  And if so, what is the directionality of influence? |  |  |
| 5 | intro - why gesture | So why gesture, or what do we gain from looking at how people gesture?..  CMT is often criticized for relying on linguistic evidence, and as has been pointed out by many, we need other sources of data with which to test the core tenet that linguistic metaphors reflect how we think about abstract concepts.  Gestures then offer a second perspective on metaphor production.  As Alan Cienki, one of the first to examine metaphors in gesture argues: gestural data provides..  Given that spatial metaphors differ crosslinguistically, bilinguals with two spatial metaphors in their languages for an abstract phenomenon may provide important clues about the possible spatial representations underlying the production of metaphors for pitch, and the extent to which these are flexible and covary with the language in use.  Furthermore, in the context of bilingualism studies, gestures may similarly provide evidence of crosslinguistic influence that may be hidden from speech. |  |  |
| 6 | Study - presentation | The focus of our study is on metaphors for musical pitch and the extent to which bilingual speakers of HEIGHT and THICKNESS languages express these language-specific spatial mappings in speech and gesture depending on the linguistic context. |  |  |
| 7 | study - methods | For this study we recruited 16 functional bilingual speakers of Swedish and Turkish among students and local residents in Lund and Stockholm.  Task....  Stimuli... |  |  |
| 8 | study - hypotheses | We have recent data from monolinguals indicating that ‘height’ is sometimes also used in Turkish, whereas  ‘thickness’ appears to be unavailable in Swedish.  we therefore hypothesised that convergence  would occur with ‘height’ (use more likely to increase in bilingual Turkish), but not with  ‘thickness’ (in bilingual Swedish) | Why not mono- and bilinguals in the same study? | There would be to many stories to unpack (metaphor, gesture, bilingualism) / different foci for the studies |
| 9 | coding - speech |  |  |  |
| 10 | coding - gesture | Gesture stroke is the core gesture phase, the meaningful part of the gesture unit, from preparation to retraction, aligning with speech |  |  |
| 11 | coding - convergence | (go through coding scheme) |  |  |
| 12 | results | - |  |  |
| 13 | results - speech | The purple bars show the frequencies of the language-specific spatial metaphors. Height was used often in Swedish, though brightness was more common, and we also found cases with thickness. In Turkish, participants mostly used thickness, but height also frequent. Other metaphors include 'strength' and 'roundness'  In the next slides, we will only focus on the spatial metaphors for which we could formulate hypotheses about co-expressivity in gesture. |  |  |
| 14 | results - speech + gesture I | In this figure, we see that participants using the height metaphor in the Swedish language condition always produced gestures coded as vertical as opposed to gestures indicating thickness. In Turkish, participants sometimes produced vertical gestures with thickness in speech. |  | check model |
| 15 | results - speech + gesture II | In this next figure, we consider the language-specific spatial metaphors in the context of both languages. We see that the height metaphor was frequently co-expressed in gesture when used in the Turkish language condition. In both conditions, the thickness metaphors is accompanied by co-expressive gestures to a lesser extent. |  |  |
| 16 | Examples - converging | (introduce examples) |  |  |
| 17 | examples - diverging | (introduce examples) |  |  |
| 18 | Discussion | In speech, we find that language-specific metaphors are used in both languages.  But as expected, HEIGHT is transferred more frequently than THICKNESS, which is likely due to the HEIGHT mapping being available in Turkish, perhaps under influence from English usage.  This contrasts with monolingual usage patterns where we find more consistent use of the dominant spatial metaphors in the two languages.  Regarding speech and gesture, we find a fairly high degree of co-expressivity in both language and metaphor pairs. Again, this pattern is more consistent for HEIGHT in Swedish, and even for HEIGHT when used in Turkish compared to THICKNESS.  It might be that HEIGHT is somehow more salient. However, evidence from preferential looking studies with young infants suggest that both mappings are acquired before language.  Instead these findings may rather be indicative of flexibility in bilinguals' linguistic and perhaps mental representations of pitch in terms of space | metathetic vs. prothetic continua as explanation for HEIGHT being somehow special? |  |
| 19 | Conclusion | Coming back to our research question*: Do bilinguals with incompatible spatial metaphors in their languages*  *show evidence of convergence in bimodal language production?*  The short answer appears to be YES: convergence mostly towards the height mapping. |  |  |
| 20 | Further directions | It might be the case that more detailed analyses of speech and gesture production can offer more insight regarding the conditions under which speakers select one metaphor over another in language production.  E.g. comparing cases with and without pauses, or cases with exact temporal alignment of speech and gesture vs. cases in which gesture precedes or follows speech.  Lastly, in three very recent studies, we examine the bimodal production of pitch metaphors, as well as the implicit and explicit association between pitch and spatial dimensions in speakers of Xhosa, a language in which both HEIGHT and SIZE are common metaphors for pitch, and Afrikaans, in which height is the dominant metaphor. |  |  |
| 21 | Acknowledgements |  |  |  |
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