Experiments in Linguistics

MA Seminar prof. Nau

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In which fields of linguistics are experiments used?

- Psycholinguistics
- Neurolinguistics
- Cognitive linguistics
- Sociolinguistics
- Core linguistics: Phonology, Syntax, Semantics
- …

What kind of data is collected?

- Linguistic data: words, sentences, utterances, texts, dialogues
- Metalinguistic data : judgments, interpretations
- Test scores
- Non-linguistic data: brain activitiy, bodily responses, reaction time

Jankowiak, K., Korpal, P., 2018. On modality effects in bilingual emotional language processing: Evidence from galvanic skin response.

[…] The present experiment was therefore aimed at investigating how late proficient Polish (L1)–English (L2) bilinguals process emotionally-laden narratives presented in L1 and L2, in the visual and auditory modality. To this aim, we employed the galvanic skin response (GSR) method and a self-report measure (Polish adaptation of the PANAS questionnaire). The GSR findings showed a reduced galvanic skin response to L2 relative to L1, thus suggesting a decreased reactivity to emotional stimuli in L2. Additionally, we observed a more pronounced skin conductance level to visual than auditory stimuli, yet only in L1, which might be accounted for by a self-reference effect that may have been modulated by both language and modality.

Birk, S.J., Kausel, E.E., 2016. The Language of Fairness: how Cross-Linguistic Norms in Spanish and English Influence Reactions to Unfair Treatment. The Spanish journal of psychology 19.

We integrate recent findings from the linguistics literature with the organizational justice literature to examine how the language used to encode justice violations influences fairness perceptions. The study focused on the use of non-agentive syntax to encode mistakes in Spanish ("The vase was broken") versus using agentive syntax in English ("She broke the vase"). We hypothesized that when justice violations are encoded using Spanish, because the non-agentive syntax makes the responsible party less salient, the event would be perceived as less unfair.

In Study 1 (n = 111), English-speaking participants rated the fairness of an event in which a mistake was made and an employee received a negative outcome. They rated it as more unfair ($p < .01$, $\eta 2 = .06$) when the scenario was presented in agentive syntax. Experiment 2 (n = 70) used native English- and Spanish-speakers who watched a video of manager making a mistake. We found that Spanish-speakers used less agentive syntax ($p < .01$, $\eta 2 = .21$), perceived the event as less unfair ($p < .001$, $\eta 2 = .23$), and were more willing to help the manager who made the mistake. In Experiment 3 (n = 101) we replicated this effect controlling for cross-cultural differences and native language; further, we found an interaction between entity fairness (event vs. entity) and native language (Spanish vs. English) on citizenship intentions ($p < .01$, $\eta 2 = .08$). These results extend our understanding of how language may influence relevant workplace attitudes.

De Freitas, J., DeScioli, P., Nemirow, J., Massenkoff, M., Pinker, S., 2017. **Kill or Die: Moral Judgment Alters Linguistic Coding of Causality.** Journal of Experimental Psychology: Learning, Memory, and Cognition 43, 1173–1182.

What is the relationship between the language people use to describe an event and their moral judgments? We test the hypothesis that moral judgment and causative verbs rely on the same underlying mental model of people's actions. Experiment 1a finds that participants choose different verbs to describe the major variants of a moral dilemma, the trolley problem, mirroring differences in their wrongness judgments: they described direct harm with a single causative verb ("Adam killed the man"), and indirect harm with an intransitive verb in a periphrastic construction ("Adam caused the man to die"). Experiments 1b and 2 separate physical causality from moral valuation by varying whether the victim is a person or animal and whether the harmful action rescues people or inanimate objects. The results show that people's moral judgments lead them to portray a causal event as either more or less direct and intended, which in turn shapes their verb choices. Experiment 3 finds the same basic asymmetry in verb usage in a production task in which participants freely described what happened.

Malarski, K., Jekiel, M., 2018. **Cross-dialectal analysis of English pitch range in male voices and its influence on aesthetic judgments of speech.** Poznan Studies in Contemporary Linguistics 54, 255–280.

This study focuses on the differences in pitch register and pitch span across five accents of English, and investigates their potential effects on judgements of speech. We recorded two male middle-aged speakers for each of the following accents of English: Brighton, Manchester, Perth, New Jersey and Edmonton. Then, we modified pitch register in selected spontaneous speech recordings by raising the overall pitch in the recordings by 5 Hz and 15 Hz using Praat. The entire material was then randomized and prepared for an online survey. A group of 50 respondents (30 female, 20 male) who were non-native speakers of English were asked in a blind study to evaluate both the unmodified and modified recordings on a 7-point Likert scale in terms of their perceived attractiveness, friendliness, prestige and self-confidence. Overall, it has been found that pitch span can be a telling cue when evaluating perceived friendliness for both gender groups, while pitch register can affect male listeners in evaluating attractiveness and self-confidence. […]

Ong, J.H., Burnham, D., Escudero, P., Stevens, C.J., 2017. Effect of Linguistic and Musical Experience on Distributional Learning of Nonnative Lexical Tones. Journal of Speech, Language, and Hearing Research 60, 2769–2780.

Purpose: Evidence suggests that extensive experience with lexical tones or musical training provides an advantage in perceiving nonnative lexical tones. This investigation concerns whether such an advantage is evident in learning nonnative lexical tones based on the distributional structure of the input.

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Method: Using an established protocol, distributional learning of lexical tones was investigated with tone language (Mandarin) listeners with no musical training (Experiment 1) and nontone language (Australian English) listeners with musical training (Experiment 2). Within each experiment, participants were trained on a bimodal (2-peak) or a unimodal (single peak) distribution along a continuum spanning a Thai lexical tone minimal pair. Discrimination performance on the target minimal pair was assessed before and after training. **Results**: Mandarin nonmusicians exhibited clear distributional learning (listeners in the bimodal, but not those in the unimodal condition, improved significantly as a function of training), whereas Australian English musicians did not (listeners in both the bimodal and unimodal conditions improved as a function of training). Conclusions: Our findings suggest that veridical perception of lexical tones is not sufficient for distributional learning of nonnative lexical tones to occur. Rather, distributional learning appears to be modulated by domain-specific pitch experience and is constrained possibly by top-down interference.

What makes a task an experiment?

Phonetics and Phonology

Instructions for listening to Recordings 10.2 and 10.3
Recordings 10.2 and 10.3 each have nine items, each of which might be either *bad* or *bat*. Write down whichever of the two words you think it is. Some of the words may sound like neither bad nor bat, in which case you should just guess which you think it is most like. The words are 1.5 seconds apart, so you won't have much time to make up your mind. It's your quick guesses that matter.

http://www.vowelsandconsonants3e.com/chapter_10.html#a1096

Syntax and semantics

- Offline and online methods
- Production and comprehension (processing)
- Linguistic and non-linguistic responses
- Grammaticality judgements
- Sentence manipulation
- Controlled production (elicitation)

Féry, C., Skopeteas, S., Hörnig, R., 2010. Cross-linguistic comparison of prosody, syntax and information structure in a production experiment on localising expressions. Transactions of the Philological Society 108, 329–351.

This article presents a cross-linguistic study of semi-spontaneous data obtained from an experiment conducted uniformly for six languages. It examines how native speakers communicate the changing spatial layouts of toy animals. The analysis of the data focuses on the universal preference for expressing a given constituent before a new one.

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In terms of grammatical strategies, speakers universally tend to realise the newly introduced or displaced toy animal in a position where it is aligned with a high-level prosodic domain. A constraint to achieve this effect, called AF-R, is formulated as an optimality-theoretic alignment principle. Language-dependent syntactic and prosodic restrictions may favour or disfavour this tendency. Some languages may reorder their constituents by scrambling, some may use more costly syntactic and prosodic operations, like dislocations, or the insertion of a prosodic boundary. Some use pitch accents, but some do not possess pitch accents in their phonological inventory. A constituent right aligned with a higher-level prosodic domain may be felt prominent, but prominence is only a secondary effect of alignment.

[this is rather a bad abstract]

What makes a task an experiment?

A complex example

Gerwien, J., Von Stutterheim, C., 2018. Event segmentation: Cross-linguistic differences in verbal and non-verbal tasks. Cognition 180, 225–237.

General ideas and questions:

How do people perceive and identify (“segment”) events? What is “an event” for us?

Does our (native, main) language have an influence on our perception of events?

“Does language, and language use, shape and specify event schemata in long-term memory so as to support rapid and automatic access when perceiving and understanding information on the world around us?”

“we investigate in how far speakers of different languages diverge in patterns of event unit formation, in both verbal as well as non-verbal tasks.”

The events and languages studied

Motion events and their lexicalization

Displacement and manner (after Talmy)

Type 1: *He **left** the room. He **decended** the stairs. He **entered** the water.* (verb expresses motion + displacement)

Type 2: *She **walked** out of the room. She **walked** down the stairs. She **jumped** into the water.* (verb expresses motion + manner; displacement is expressed by a preposition or adverb – a “satellite”)

French: Type 1 language (“verb-framed”)

German: Type 2 language (“satellite-framed”)

Hypothesis: This typological difference influences event segmentation.

=> Changes in direction require selection of a new event unit in French, but not in German.

Une personne	‘a person’
a. *entre*	‘enters’
b. *elle tourne*	‘she turns’
c. *et monte les escaliers*	‘and climbs the stairs’

Eine Frau geht um einen Brunnen herum eine Treppe rauf.
‘A woman goes around a fountain hither-round a ‘set of steps’ up’

«Our hypothesis in the present study is as follows: speakers of French and German will differ in event unit formation in a verbal task when describing trajectories given a change in direction of a moving figure. We also test in how far this applies in a standard non-verbal segmentation task.»

Experiment 1 (verbal output)

20 French and 20 German university students

watch short videos and describe what happens

«The participants were instructed to describe what happened in the scenes presented and to use full sentences […]. They were also explicitly asked to focus on the dynamic situation, and not the scenery depicted in the videos.»

real-world scenes, including control stimuli (with no change of direction)

Critical items

1. A woman walks past a fountain up some stairs
2. A young woman rushes down some stairs, and runs down the path
3. A tennis ball comes rolling towards some stairs and rolls down the steps
4. A woman pushes a stroller towards a ramp, turns right and pushes it down the ramp
5. A small ball bounces down some stairs and then rolls over to the right
6. A woman on a bike cycles down a cobbled road and goes around a corner towards an open gateway
7. A man passes by a parking lot, turns left and approaches the entrance of an old building
8. A man passes by a parked car, turns left and passes through a gateway
9. A man is walking on a street, turns left and approaches the entrance of a building
10. A man is walking down a street, turns right and walks up some stairs by taking two steps at once

Control items

1. A woman is passing by a fountain in a park.
2. A boat is slowly going up a river.
3. A young man is passing by a fountain while dribbling with a tennis ball.
4. A girl is walking up a hill approaching a cabin.
5. A man is walking down some stairs outdoors, approaching a wooden gate.
6. A young man is dribbling with a soccer ball in front of a building.
7. A woman is walking with a woven basket along a path way.
8. An old man on a bike is slowly approaching a lamp post in front of a building.
9. A man on a bike is approaching the gateway of a courtyard.
10. A person on a scooter is slowly driving down a street.

Analysis: counting assertions

Result: yes, French has more assertions than German

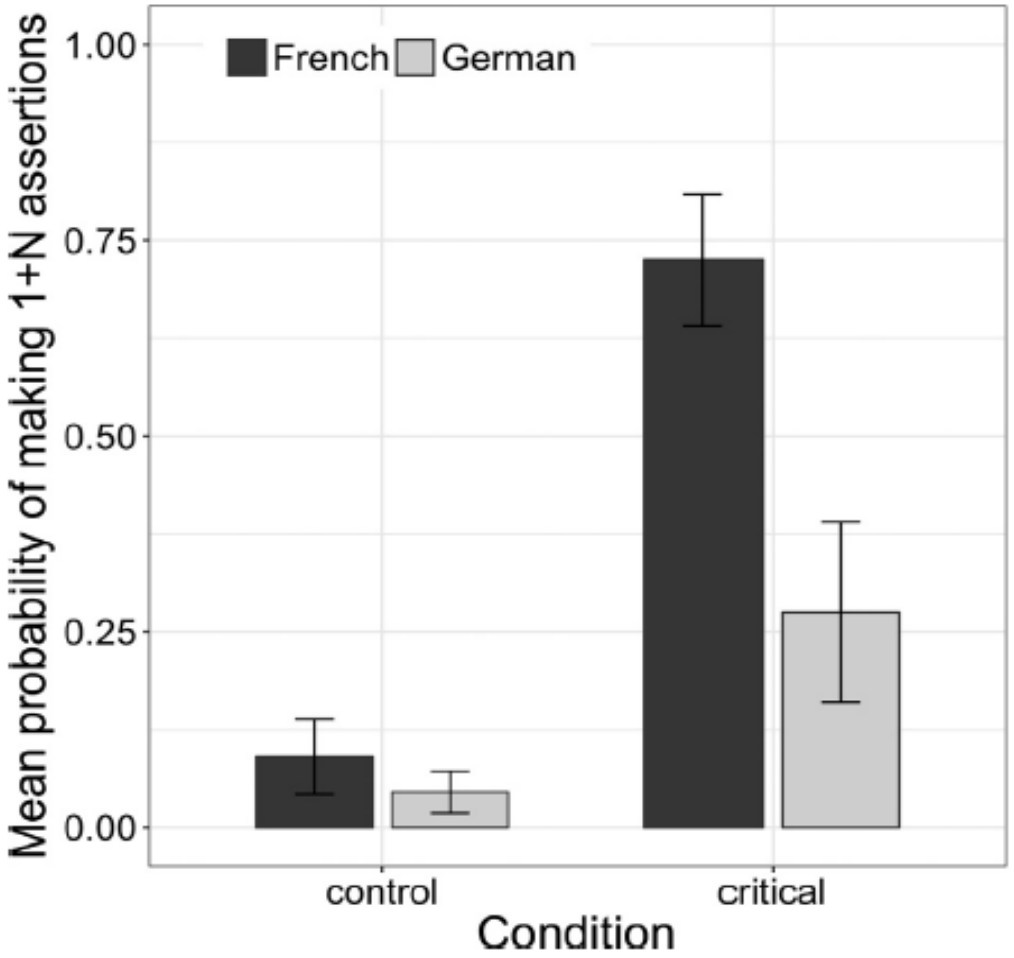

Fig. 3. Mean probability of making more than one assertion (error bars indicate 95% confidence intervals).

Experiment 2: non-verbal response (press button)

20 French and 20 German university students (different from experiment 1)

watch the same short videos and press space bar when something changes

«They should use the space bar on the computer keyboard to indicate when they perceive a change in the situation presented in the clip. Since some subjects in a pilot study of the current experiment did not understand what was meant by “change in the situation”, this was further clarified in the instructions with “… whenever something new happens in the scene”.»

Analysis: frequency and place where button was pressed

Result: yes, French students pressed more often and the difference is significant; they were also quite uniform in where they pressed the button.

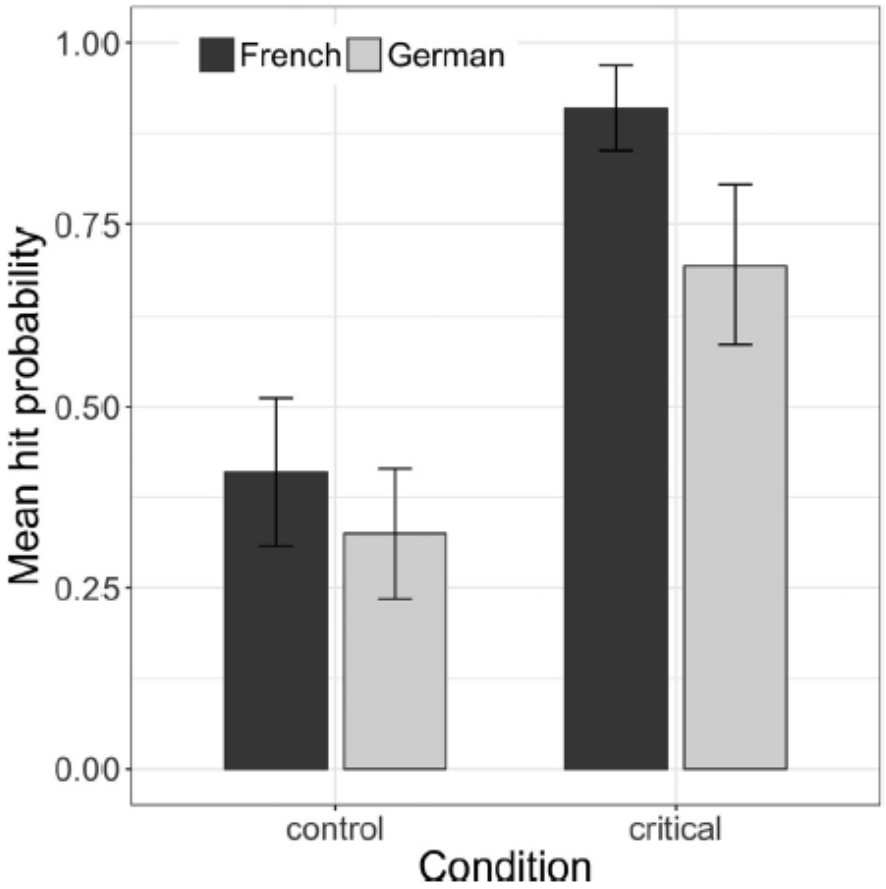

Fig. 5. Mean hit probability (aggregated by items, error bars indicate 95% confidence intervals).

How to interpret the results? What are possible problems?

A very complex and yet simple experiment

https://colorgame.net/en/

(not active anymore)

Some resources

- https://experimentalfieldlinguistics.wordpress.com/
- Non-words

  http://www.cogsci.mq.edu.au/research/resources/nwdb/nwdb.html
- Perception experiments Ladefoged

  http://www.vowelsandconsonants3e.com/chapter_10.html#a1096
- Picture naming project

  https://crl.ucsd.edu/experiments/ipnp/
- Lexicon project

  http://crr.ugent.be/programs-data/lexicon-projects