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The role of anticipation in irony processing in the native and non-native language: Behavioral and event-related potentials studies

A PhD project under the supervision of:

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BACKGROUND

- Communication is a complex phenomenon which requires a confluence of multiple factors such as previous experience, contextual cues, language(s) of interaction, inferential and anticipatory ability.
- Cumulative evidence shows that anticipation is a default brain activity (Bar 2007; Bar 2011), i.e. human brain constantly generates predictions to make sense of incoming verbal stimuli (Van Berkum 2010). Anticipation stems from the experience as well as the current situational context.

- A great deal of messages are communicated between the lines in a veiled manner. Irony is a key example of indirect communication, where explicit (literal) and implicit (ironic) meanings are in conflict (Grice 1975).
- So far few studies have pointed to the significant role of anticipation in irony processing. Regel and colleagues showed that implicit knowledge about the speaker's communicative style influences irony comprehension as early as 200 ms post stimulus onset.

- Bromberek-Dyzman and colleagues (2021) demonstrated that anticipated irony was processed faster and more accurately compared to unanticipated irony.
- The specific mechanisms of how exactly anticipation modulates irony comprehension are not understood.
- At the same time, currently, we do not know whether anticipatory processes operate similarly in the native and non-native language in bilinguals when they process irony.



OBJECTIVE

The goal of the present PhD project is to explore the role of anticipation in irony processing in the native and non-native language.

STUDY 1: BEHAVIORAL

METHOD

Participants: 100 Polish-English highly proficient bilinguals

Anticipation: 2 groups,

2 communication styles: ironic and non-ironic – an episode of a particular TV show

Materials:

- ❖ written ironic interactions in L1 (Polish) and L2 (English) from 2 TV shows,
- ❖ written non-ironic interactions in L1 and L2 from 2 TV shows,
- ❖ nonsensical questions in L1 and L2



WHAT DO WE MEASURE?

- ✓ REACTION TIMES
- ✓ ACCURACY

NORMING STUDIES

- To test the irony of the excerpts
 - 40 respondents
- The final comment (*Is it ironic?*)
 - 4-point Likert scale



WHAT DO WE MEASURE?

- ✓ REACTION TIMES
- ✓ ACCURACY

- ✓ EVENT-RELATED POTENTIALS:
 - SPN (pre-stimulus anticipatory processes)
 - P200 (post-stimulus anticipatory processes)
 - N400 (semantic integration)
 - LPP (meaning integration)



HYPOTHESES

- **Faster** reaction times and **more accurate** responses for anticipation-driven comments (Ironic comments - *House, M.D.*, non-ironic comments – *Homeland*) (Regel et al. 2010)
 - Similar response times and accuracy patterns for ironic and non-ironic stimuli processing in the native and non-native language (Bromberek-Dyzman et al. 2021).

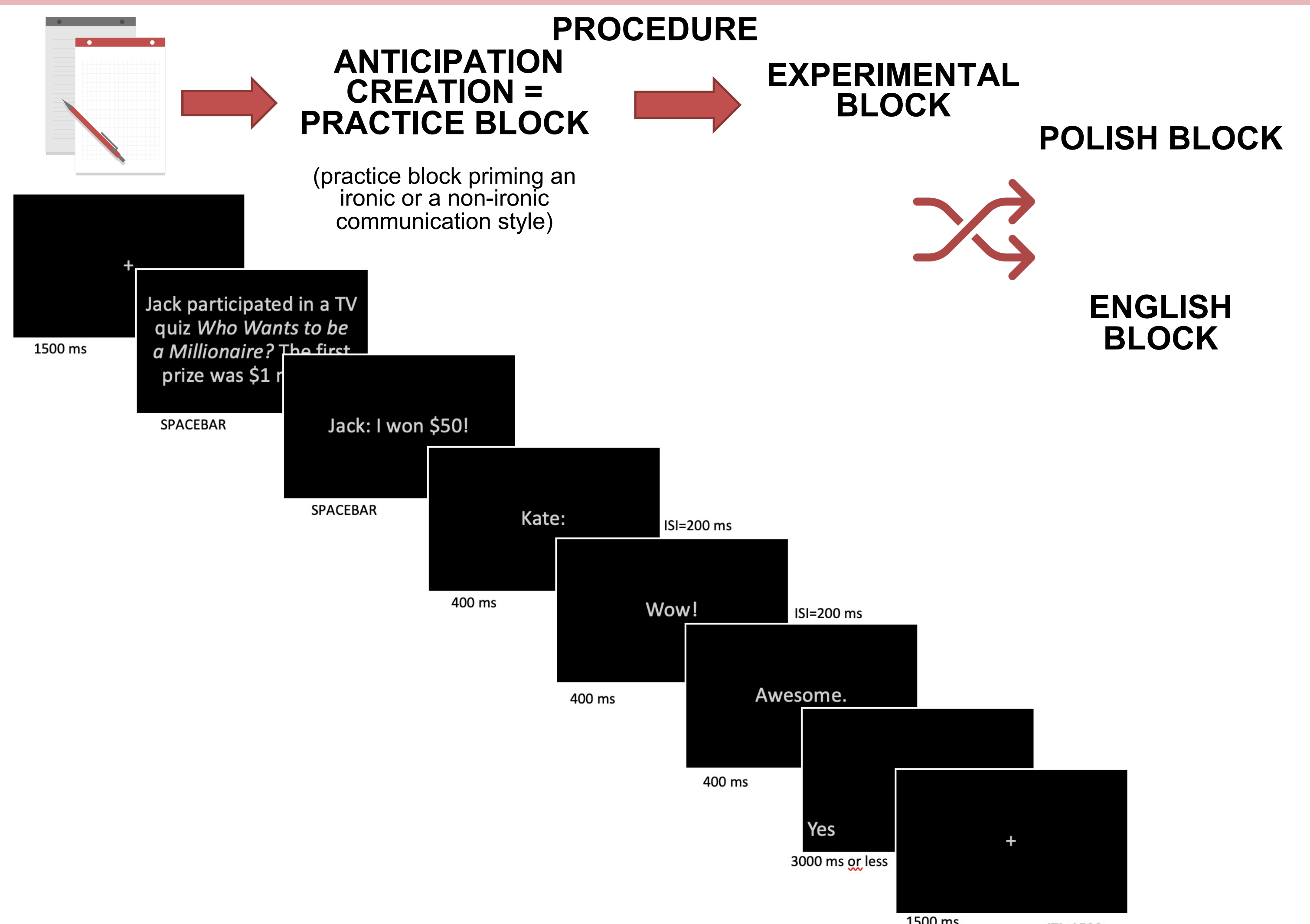
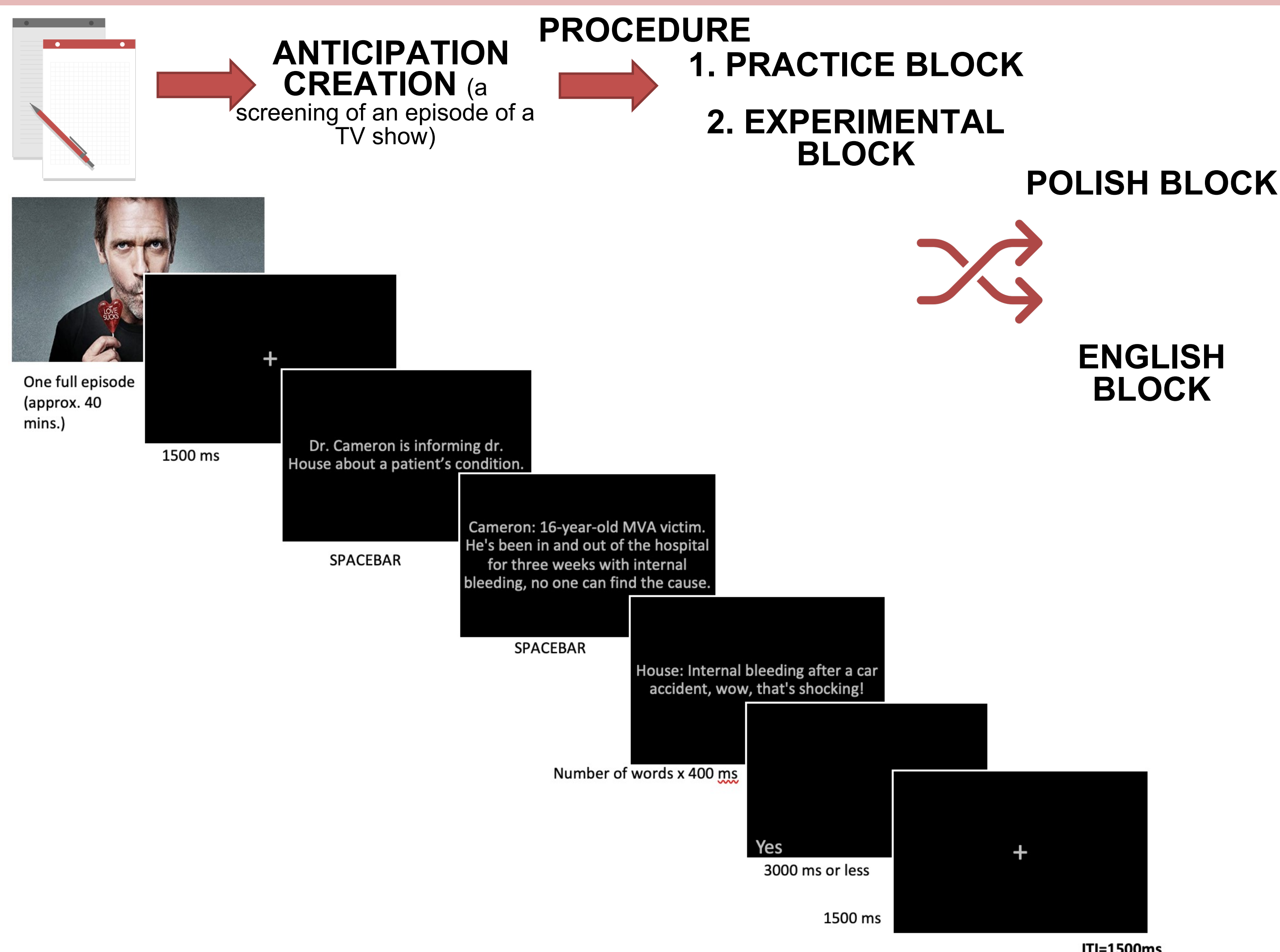
- **SPN:** Larger amplitudes for comments in the L2 (Wu and Thierry 2017)
- **P200:** Larger amplitudes for target comments congruent with the respective language/comment type (Regel et al. 2010).
- **N400:** Increased and delayed amplitudes for ironic comments (Caffarra et al. 2019; Caillies et al. 2019) and for the non-native language (L2) compared to the native language (L1) (Moreno and Kutas 2005).
- **LPP:** More pronounced amplitudes to ironic comments (Caffarra et al. 2019; Spotorno et al. 2013) and in L2 (Foucart et al. 2015).

STUDY DESIGN

2 X LANGUAGE (Polish, English), 2 X COMMENT TYPE (ironic, literal), 2 X GROUP (watching *House, M.D.*, watching *Homeland*)

STUDY DESIGN

2 X FREQUENCY (ironic, non-ironic), 2 X COMMENT TYPE (ironic, literal), 2 X LANGUAGE (Polish, English)



WE EXPECT TO FIND OUT...

- How anticipation affects irony comprehension and whether it results in faster and more accurate responses;
- Whether irony is comprehended differently (faster/slower, more/less accurately) in the native (L1) and non-native (L2) language.

- When anticipation affects irony processing, i.e. before (SPN) or after (P200) an intention is communicated;
- How the semantic integration (N400) and pragmatic meaning integration (LPP) components are modulated by anticipation effects;
- Whether the ERPs reflecting irony processing differ in L1 and L2.

REFERENCES

Bar, Moshé. 2007. "The proactive brain: using analogies and associations to generate predictions". *TRENDS in Cognitive Sciences* 11, 7: 280-289.

Bar, Moshé. 2011. *Predictions in the brain. Using our past to generate a future*. New York: Oxford University Press.

Bromberek-Dyzman, Katarzyna, Katarzyna Jankowiak and Paweł Chelminiak. 2021. "Modality matters: Testing bilingual irony comprehension in the textual, auditory, and audio-visual modality". *Journal of Pragmatics* 180: 219-231.

Caffarra, Sedy, Arman Motamed Haeri, Elissa Michell and Clara D. Martin. 2019. "When is irony influenced by communicative constraints? ERP evidence supporting interactive models". *European Journal of Neuroscience* 50, 10: 3596-3577.

Caillies, Stéphanie, Pamela Gobin, Alexandre Obert, Sarah Terrien, Alexandre Coutté, Galina Iakimova and Chrystel Besche-Richard. 2019. "Asymmetry of affect in verbal irony understanding: What about the N400 and P600 components?". *Journal of NeuroLinguistics* 51: 268-277.

Foucart, Alice, Xavier Garcia, Meritxell Aiguasanos, Guillaume Thierry, Clara Martin and Albert Costa. 2015. "Does the speaker matter? Online processing of semantic and pragmatic information in L2 speech comprehension". *Neuropsychologia* 75: 291-303.

Grice, Herbert Paul. 1975. "Logic and conversation", in: P. Cole and J. L. Morgan (eds.), *Syntax and semantics: Vol. 3. Speech acts*. New York: Academic Press, 41-58.

Grosjean, François. 2021. "The extent of bilingualism", in: François Grosjean (ed.), *Life as a bilingual: Knowing and using two or more languages*. Cambridge University Press, 27-39.

Moreno, Eva M. and Marta Kutas. 2005. "Processing semantic anomalies in two languages: an electrophysiological exploration in both languages of Spanish-English bilinguals". *Cognitive Brain Research* 22: 205-220.

Regel, Stefanie, Sienna Coulson and Thomas C. Gunter. 2010. "The communicative style of a speaker can affect language comprehension? ERP evidence from the comprehension of irony". *Brain Research* 1311: 121-135.

Spotorno, Nicola, Anne Cheylus, Jean-Baptiste Van Der Henst and Ira A. Noveck. 2013. "What's behind a P600? Integration operations during irony processing". *PLoS ONE* 8, 6: 1-10.

Van Berkum, Jos. J. A. 2010. "The brain is a prediction machine that cares about good and bad - Any implications for neuropragmatics?". *Italian Journal of Linguistics* 22, 1: 181-208.

Wu, Yan Jing and Guillaume Thierry. 2017. "Brain potentials predict language selection before speech onset in bilinguals". *Brain & Language* 171: 23-30.