

28/2/26

To the Doctoral Committee,
School of Languages and Literatures,
Adam Mickiewicz University

Please find below my review of the dissertation by Patrycja Kakuba, titled “*The role of animacy violation in novel metaphor processing and comprehension*”, according to the instructions provided.

The dissertation investigates the role of animacy violations in the processing and comprehension of novel metaphors in Polish, using event-related potentials (ERPs). The work comprises five chapters. The first three chapters provide the theoretical and methodological foundations: Chapter 1 reviews major theories of metaphor processing and comprehension, including the Career of Metaphor model and the Conceptual Blending theory; Chapter 2 surveys research methods used in metaphor research with a focus on ERP studies examining the N400 and LPC components; and Chapter 3 addresses the concept of animacy as a fundamental cognitive dimension and reviews the limited existing research on animacy violations in figurative language processing. The empirical core of the dissertation consists of two interconnected studies. The first is a series of normative studies (N = 112 per measure) in which Polish native speakers rated the meaningfulness, metaphoricity, familiarity, and cloze probability of four types of stimuli: novel metaphors with animacy violations, novel metaphors without animacy violations, literal sentences, and anomalous sentences. These normative studies served to validate the experimental materials for the main study. The main study is an ERP experiment (N = 31) employing a binary semantic decision task to compare neural and behavioral responses to the four sentence types. The central finding is that novel metaphors with animacy violations elicited significantly larger N400 amplitudes than novel metaphors without animacy violations, suggesting that the violation of animacy expectations increases cognitive demands during metaphor processing. Both the N400 and a subsequent sustained negativity (600–800 ms) showed frontal rather than the more commonly reported centro-parietal distribution, which is attributed to increased working memory engagement driven by the delayed response paradigm and the animacy manipulation. The dissertation addresses an identifiable gap in the psycholinguistic literature, as only a few prior studies have examined the interaction of animacy violations and novel metaphor comprehension.

Methodology: The dissertation employs a methodology well-established in psycholinguistic research on figurative language, combining normative rating studies with an ERP experiment. This two-stage approach — first validating stimuli, then measuring neural responses — reflects a rigorous and systematic research design. The normative studies assessed meaningfulness, metaphoricity, familiarity, and cloze probability, each rated by 112 native speakers of Polish. The selection of these dimensions is well-justified, as each has been shown to influence ERP responses to linguistic stimuli. The use of separate participant groups for each measure and the exclusion of normative raters from the main ERP experiment prevent carry-over effects. The choice of nonparametric statistical tests is appropriate for Likert-scale data.

The stimulus construction deserves particular praise. The candidate controlled for multiple variables known to modulate ERP responses (word length, lexical frequency, concreteness, grammatical number, and case) and verified all parameters against the SUBTLEX-PL corpus. The

design choice of having sentences differ only in the adjective preceding the target noun is elegant and effectively isolates the experimental manipulation. The exclusion of polysemous words, cognates, and interlingual homographs further demonstrates thoroughness in material preparation. The ERP experiment follows a sound design. The delayed response paradigm prevents motor artifacts from contaminating the critical ERP time window, and the RSVP technique is appropriate for sentence-level ERP research. The EEG recording setup (64-channel system, 1000 Hz sampling rate) meets current standards, and the preprocessing pipeline including ICA-based artifact correction is methodologically sound. The counterbalancing across four lists, inclusion of filler sentences to balance response categories reflect careful experimental planning. The statistical approach is appropriate and standard.

Overall, the methodology is well-chosen, carefully implemented, and appropriate for the research questions. The candidate demonstrates strong competence in both behavioral and electrophysiological research methods.

Research Objective and Execution: The research objective of the dissertation is clearly and precisely formulated. The candidate identifies a well-motivated gap in the literature — while novel metaphor comprehension and animacy violations have each been studied separately, their intersection remains largely unexplored, with only three prior studies, all conducted in Mandarin Chinese. The aim to examine whether animacy violations modulate the neural processing of novel metaphors in Polish is stated consistently throughout the dissertation and provides a coherent thread connecting all chapters. The research plan is logically structured and follows established conventions in experimental psycholinguistics. The candidate first developed and validated experimental materials through comprehensive normative studies, controlling for dimensions known to influence ERP responses. The careful design demonstrates strong methodological awareness. This preparatory work fed into a well-designed ERP experiment, with clear, directional hypotheses grounded in the preceding theoretical chapters.

The execution of the research plan was successful. The normative studies confirmed that stimuli were perceived as intended, and the ERP experiment followed standard procedures with appropriate signal processing and statistical analysis. The candidate formulated five hypotheses, most of which received full or partial support. The frontal, rather than centro-parietal distribution deviated from predictions but the candidate provided well-reasoned interpretations drawing on relevant literature. The sample size of 31 participants, while not uncommon in ERP research, limits statistical power for some of the smaller effects, and the candidate would benefit from acknowledging this more explicitly. Nevertheless, the core finding that animacy violations significantly modulate N400 responses to novel metaphors is well-supported and represents a meaningful contribution.

Theoretical Foundation: The candidate demonstrates a solid and well-organized knowledge of the theoretical foundations and current research relevant to the dissertation topic. The three theoretical chapters establish a coherent framework that effectively motivates the empirical studies. Chapter 1 provides a comprehensive overview of theories of metaphor processing and comprehension, progressing from early accounts such as the Standard Pragmatic View (Grice 1975) through more contemporary models including the Graded Salience Hypothesis (Giora 1997), the Conceptual Blending theory (Fauconnier and Turner 2003), and the Career of Metaphor model (Bowdle and Gentner 2005). The candidate shows an ability to critically engage with these frameworks, not merely summarizing them but drawing out their implications for the

experimental design. The Career of Metaphor model in particular serves as a consistent interpretive thread throughout the dissertation, and its application to the empirical findings is well-articulated. The discussion of conventionality as a key factor modulating metaphor processing is relevant and appropriately detailed.

Chapter 2 demonstrates the candidate's familiarity with both behavioral and electrophysiological methodologies used in metaphor research. The review of ERP studies is thorough, covering the major findings on the N400, the late positive component (LPC), and sustained negativity in response to metaphorical language. The candidate draws on a broad range of studies spanning over two decades of research, from Coulson and Van Petten (2002) through to recent work by Jankowiak et al. (2025) and Menashe et al. (2024). This review provides an adequate empirical foundation for the hypotheses. The candidate also shows awareness of the methodological nuances of ERP research, including the sensitivity of components to factors such as word frequency, concreteness, and task demands.

Chapter 3 addresses the concept of animacy, which constitutes the novel theoretical contribution of the dissertation. The candidate reviews research on animacy from multiple perspectives demonstrating an understanding of animacy as a multifaceted construct rather than a simple binary distinction. The discussion of the animate monitoring hypothesis (New et al. 2007), attentional capture by animate stimuli, and animacy advantages in memory is relevant and well-integrated. Most importantly, the candidate provides a thorough and critical account of the very limited literature on animacy violations in metaphor processing (Ji et al. 2020; Li et al. 2022, 2025), carefully noting methodological differences between these studies and identifying the gaps that the present dissertation aims to address. The candidate's recognition that these studies were all conducted in Mandarin Chinese — a language with distinct grammatical properties — strengthens the justification for investigating this phenomenon in Polish.

The candidate's engagement with the literature is evident not only in the theoretical chapters but also in the discussion sections, where the findings are consistently situated within the broader research context. The discussion of the frontal N400 distribution, for instance, draws on literature beyond the immediate domain of metaphor research, including work on working memory updating (Kiss et al. 2007), the FN400 component in recognition memory (Bridger et al. 2012), and semantic integration under cognitive load (Boudewyn et al. 2013). This demonstrates the candidate's ability to draw connections across related but distinct areas of cognitive neuroscience research.

Structure: The dissertation follows a clear and logical structure consistent with monographic dissertations in psycholinguistics. The progression from theoretical foundations (Chapters 1–3) through stimulus validation (Chapter 4) to the main ERP experiment (Chapter 5) creates a coherent narrative, with each chapter building naturally on the preceding one. The introduction effectively outlines the trajectory of the argument, and the conclusion ties the findings back to the theoretical framework. The internal coherence of the dissertation is a notable strength. Theoretical concepts introduced in the early chapters are consistently referenced in the hypotheses, results interpretation, and concluding discussion. The five hypotheses in Chapter 5 are explicitly grounded in specific sections of the theoretical chapters, making the argumentative logic transparent and easy to follow.

The clarity of argumentation is good throughout. Statistical findings are reported systematically and linked to the relevant hypotheses. Where results were unexpected, particularly the frontal N400 distribution, the candidate draws on literature from adjacent research areas to offer well-reasoned interpretations, demonstrating analytical maturity. The discussion sections could occasionally benefit from more concise treatment to avoid some overlap between the N400 and sustained negativity interpretations, but this does not undermine the overall quality of the argumentation. Overall, the dissertation is well-structured, coherently argued, and presented to a good scholarly standard.

Innovation and Significance: The dissertation makes a significant and innovative contribution to the field of psycholinguistic research on figurative language processing. Its primary originality lies in examining the interaction between animacy violations and novel metaphor comprehension — a topic addressed by only three prior studies, all conducted in Mandarin Chinese. By investigating this phenomenon in Polish, a language with substantially different grammatical, morphological, and word order properties, the candidate provides the first electrophysiological evidence for the role of animacy violations in novel metaphor processing in a Slavic language. This cross-linguistic extension is valuable, as it demonstrates that the modulatory effect of animacy on metaphorical processing is not confined to a single language family or syntactic structure.

A further innovative aspect is the stimulus design. Unlike previous studies that manipulated animacy through verb-noun combinations, the present dissertation establishes animacy violations through adjective-noun pairings, broadening the generalizability of findings on animacy in figurative language. The main finding that novel metaphors with animacy violations elicit significantly larger N400 amplitudes than those without contributes meaningful evidence to our understanding of the cognitive mechanisms underlying metaphor comprehension. The additional observation that novel metaphors with animacy violations patterned similarly to anomalous sentences, while those without animacy violations patterned with literal sentences, is a noteworthy result that raises important questions about the nature of processing demands across different types of metaphorical expressions.

The unexpected finding of a frontal rather than centro-parietal N400 distribution, and the candidate's interpretation linking it to increased working memory demands during animacy violation processing, opens a productive avenue for future research on the relationship between task demands, animacy, and the neural correlates of metaphor comprehension. The comprehensive normative dataset developed for Polish novel metaphors with and without animacy violations also constitutes a practical contribution that can serve future research in this area.

Strong points

The dissertation addresses a genuinely novel research question. The role of animacy violations in novel metaphor processing has received very little attention in the literature, and the candidate clearly identifies and convincingly motivates this gap. The decision to investigate this phenomenon in Polish provides valuable cross-linguistic evidence that extends prior findings from Mandarin Chinese.

The methodological rigor of the stimulus preparation is commendable. The candidate exercised careful control over a wide range of lexical and sentential variables — word length, frequency,

concreteness, grammatical case, animacy — and validated the materials through comprehensive normative studies across four dimensions with a substantial number of raters. The elegant design choice of having sentences differ only in the critical adjective effectively isolates the experimental manipulation. This level of stimulus control reflects a mature understanding of the demands of electrophysiological research.

The theoretical grounding is thorough and well-integrated. The candidate draws on relevant literature from multiple domains — metaphor processing, ERP methodology, and animacy in cognition — and synthesizes these into a coherent rationale for the study. The discussion of the findings demonstrates analytical depth, particularly in the treatment of the unexpected frontal N400 distribution, where the candidate draws productively on working memory literature to offer a well-supported interpretation.

The ERP study design is sound, with appropriate counterbalancing, artifact rejection procedures, and statistical analyses. The decision to use a delayed response paradigm to avoid motor artifact contamination shows thoughtful experimental planning. The inclusion of supplementary analyses on correct trials and baseline inspection strengthens confidence in the reported findings.

The normative dataset and validated stimulus set for Polish novel metaphors with and without animacy violations represent a practical contribution to the field that can benefit future research.

Points requiring the candidate's response

While recognizing the overall quality of the work, several points would benefit from the candidate's clarification or reflection during the defense.

First, the sample size of 31 participants yields limited statistical power for the observed ERP effect sizes, which are in the small range typical for electrophysiological research (partial eta squared values between .01 and .05). The dissertation does not include a power analysis, either a priori or post-hoc. I would like the candidate to reflect on how confident we can be in the reported findings — particularly the null effects, such as the non-significant difference between novel metaphors with and without animacy violations in the sustained negativity window. Could this null result reflect insufficient power rather than a genuine absence of the effect, and how does this influence the theoretical conclusions drawn from the later time window?

A second question regards the accuracy rate for novel metaphors. As in other studies in the literature, novel metaphors were near chance level. This raises a question about the appropriateness of the binary meaningful/meaningless judgment for novel metaphors, which occupy an inherently ambiguous semantic space. I would appreciate the candidate's reflection on whether an alternative task — such as a graded meaningfulness judgment or a different response paradigm — might have been more sensitive to the processing differences between the two types of novel metaphors, and what implications the near-chance accuracy has for interpreting the ERP data, given that all trials (correct and incorrect) were included in the analysis. Would a direct comparison of correct and incorrect trials help?

Third, the N400 effect showed a frontal rather than the hypothesized centro-parietal distribution. The candidate offers several post-hoc explanations for this finding, drawing on working memory literature, the RSVP technique, and the delayed response paradigm. However,

multiple explanations are presented without a clear adjudication between them. Could the candidate discuss which account they consider most likely and whether future research could disentangle these contributing factors?

Fourth, the normative studies revealed that novel metaphors with animacy violations were rated as significantly more metaphorical than those without animacy violations. Since metaphoricity is known to modulate N400 responses, could the candidate comment on whether the N400 difference between the two metaphor conditions might partly reflect this difference in perceived metaphoricity rather than (or in addition to) the animacy violation per se?

These questions are intended to invite the candidate's reflection and do not diminish the value of the dissertation as a whole. The work makes a meaningful empirical contribution and demonstrates the candidate's competence as an independent researcher.

Conclusion: In my opinion the manuscript meets the requirements for a doctoral dissertation. It presents an original solution to a scientific problem within the field of psycholinguistics. The candidate has identified a genuine and well-motivated gap in the existing literature, formulated clear research questions and hypotheses, and addressed them through a methodologically rigorous empirical investigation combining normative studies with an event-related potential experiment. The work demonstrates that animacy violations significantly modulate the neural processing of novel metaphors — a finding that contributes new knowledge to our understanding of figurative language comprehension.

The candidate demonstrates sufficient knowledge of the theoretical foundations and current state of research in the field, as well as competence in the application of electrophysiological and behavioral research methods. The dissertation is coherently structured, clearly argued, and presented to an appropriate scholarly standard. While certain limitations have been noted these do not undermine the validity of the core findings and are characteristic of challenges commonly encountered in ERP research on complex linguistic phenomena.

I therefore recommend that the dissertation be accepted and that the candidate be admitted to the subsequent stages of the doctoral procedure.

Sincerely,



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