Language Under Discussion
http://www.ludjournal.org ISSN: 2329-583x

On hypothetical grammatical emotional categories

Marta Ruda[a]

[a] Jagiellonian University in Kraków, Institute of English Studies, marta.ruda@uj.edu.pl.

DOI: 10.31885/lud.7.1.263

Paper received: 18 June 2025
Published online: 10 August 2025

Abstract. This discussion note engages with Martina Wiltschko's (2024) exploration of the relationship between language and emotions, particularly her proposal aimed at accounting for the unavailability of grammatical emotional categories and the potential for neurocognitive evidence to support a uniform approach. While the article opens up compelling theoretical and empirical directions, several aspects of the argumentation invite further clarification or critical reflection, as Wiltschko herself explicitly acknowledges. By examining some of these areas and occasionally adopting a devil's advocate perspective, this note aims to contribute to developing a nuanced understanding of the interplay between linguistic and emotional structure.

Keywords: grammatical category, constructed emotion, neurocognitive evidence

1 Introduction

In her programmatic focus article, Wiltschko (2024) addresses two central questions: 'How are emotions expressed in the languages of the world?' and 'What is the cognitive architecture that regulates the relation between language and emotions?' (p. 2). While both questions uncover a wealth of thought-provoking avenues, this discussion note focuses primarily on some aspects of Wiltschko's argumentation that remain unclear or invite further elaboration. At times, I adopt a critical perspective to provide alternative viewpoints or highlight areas where the argument might be refined or reconsidered. Section 2.1 offers comments on the theory of hypothetical grammatical emotional categories. Section 2.2 then touches upon the empirical predictions of the framework suggested in Wiltschko's article, with particular attention devoted to neurocognitive claims. Finally, Section 3 presents some concluding reflections.

Language Under Discussion, Vol. 7, Issue 1 (August 2024), pp. 70–79
Published by the Language Under Discussion Society

2 The portal to grammar and evidence for constructed emotions

In Section 3, Wiltschko (2024: 12–30) argues that there are no grammatical categories that encode emotions, in contrast to concepts like time, encoded in the grammatical category labelled Tense or (the epistemic states of) regret, desire, or surprise, encoded in Mood. The question is then what prevents emotions from entering linguistic computation like time or the epistemic states do, yielding sentences such as (1a), in addition to (1b–c). Here, small caps indicate a grammatical marker, in the case of HAPPY, a hypothetical one, but—if Wiltschko is right—also one that is universally unavailable. After all, emotions interact with linguistic expression in a number of other ways (e.g., prosody; see Wiltschko's Section 3.1, pp. 12–14).

(1) a. *[I live in Barcelona]-HAPPY. [hypothetical emotion marker (p. 30)]
b. I live-D. [tense marker]
c. Oh, THAT I had told them both a year ago! [optative marker (p. 21, small caps mine)]

Having presented evidence that grammatical emotional categories seem indeed to be unavailable, Wiltschko (2024: 30–34) then argues that this follows from the complex, combinatorial nature of emotions in that they are not primitives but—just like sentences—they are also constructed by a generative procedure which takes atomic information bundles as input and outputs the representation of an emotion. The absence of emotional categories is then taken as a(nother) piece of evidence supporting the theory of constructed emotions, in contradistinction to the theory of basic emotions.

The argumentation raises two types of questions, namely whether we would indeed necessarily expect to see grammatical emotional categories if emotions were basic primitives, and whether there is no conceivable way for a constructed emotion to enter grammar. Before I elaborate on these two concerns in Section 2.1, I would like to note first that the question of why there are no grammatical emotional categories is addressed—briefly, but still very interestingly—in Emonds (2011), referenced by Wiltschko (p. 31), but not commented on. In short, adopting an evolutionary perspective, Emonds suggests that the formal features (which construct grammatical categories) available to modern humans express (first and foremost) the primate cognitive categories rooted in vision. According to Emonds (2011: 48), vision is special in that it allows for discrete conceptualisation, in contrast to other sensory systems, with non-discreteness excluding as possible candidates for syntactic features concepts such as 'brightness, loudness, speed perception, non-speaker centred motion, *awareness of emotion (sadness, fear, anger, arousal, illness)*, and essentially all categories of feeling, taste and smell' [emphasis mine]. If correct, this idea could both address Wiltschko's primary concern and pose a potential challenge to the unifying universal hierarchy-based approach to language and emotions. For example, additional assumptions accommodating the discreteness of the former system and the non-discreteness of the latter would be required, achievable perhaps by investigating the nature of the atoms combined by each system (see also below) and/or the systems' interactions with other mental modules/processes. On the flipside, perhaps then the visual rather than the emotional system may be a potential area for extension for the universal hierarchy approach. Putting these considerations aside, I now move on to commenting on some specifics of Wiltschko's argumentation.

2.1 Specifying the portal: what can enter and how and what needs to come out

One aspect in the discussion of potential grammatical emotional categories which is not entirely clear to me is what such a category could be expected to encode. As Wiltschko points out in Section 3.2.1 (14–16), grammatical categories are typically limited both in their number and the types of meanings they are associated with, a point also made by Emonds (2011). However, our factual and potential folk psychological concepts for emotions and the associated inventory of lexical items are clearly not restricted in this way and while in Section 4.1 (30–31) Wiltschko uses such labels as 'happy' to illustrate the point that—on the theory of basic emotions—languages would be expected to grammatically encode the emotional relation of the speaker to the proposition (as they can do for the speaker's epistemic state, for example), as she discusses, such labels are unlikely to pick out actual cognitive states. But if not marking, for example, happiness vs. sadness specifically (unlike what Wiltschko suggests in Section 4.1: 30–31), then what would we expect an emotional category to encode? Perhaps this could be something like a positive vs. negative emotion, given that Wiltschko adopts the valence-based definition of emotions (p. 5). This would then be analogous to Tense/[TENSE], which is taken to encode the opposition between past and present (vs. more descriptive lexical categories like 'now', 'yesterday' or 'tomorrow').[1] In what follows, I will thus work with this assumption, abbreviated here for efficiency as Emo[VALENCE: POSITIVE/NEGATIVE].[2]

Now, taking Emo[VALENCE: POSITIVE/NEGATIVE] to stand for an emotional category which could be a functional item in a universal hierarchy, a part of the grammar on Wiltschko's approach, we may then consider what issues would arise if this category indeed existed (regardless of which theory of emotion one adopts) and whether the universal hierarchy approach (or another constructed emotions approach) can indeed block its existence. A negative answer may constitute a serious glitch in the argument that the universal lack of Emo[VALENCE: POSITIVE/NEGATIVE] supports the theory of constructed emotions.

Unlike what Wiltschko suggests, it is not entirely clear to me that we would indeed expect to see a grammatical emotional category, be it on the theory of basic emotions or any other. In what follows, I present four reasons why.

---

[1] It is an intriguing side question whether emotions need to be intrinsically valued as positive or negative. For example, Gasper et al. (2019) argue for the existence of neutral affect. While they admit that the existence of neutral emotions is less clear, they do not exclude this possibility. Applying Wiltschko's neutrality test (p. 19, example (9)) lets us expect that emotions can indeed be associated with neutral evaluations too, at least superficially.

(i) I'm sad,
   a. and I really don't like it.
   b. and I'm glad I am (it provokes me to think more deeply about my life).
   c. but whatever, it will pass/but I don't really care, because it will pass.

However, since neutral affect can co-occur with positive or negative affect (Gasper et al. 2019) and—I assume—emotions, the validity of this test seems questionable (cf. also Jijina & Biswas 2021 and references therein for discussions of the related concepts of equanimity and the attitude of non-judgment).

[2] An anonymous reviewer points out that this more general categorization shifts the discussion to 'a more basic emotional component', namely affect. This is not my intention in this note. While it is indeed the case that positive or negative affect is typically taken to be a component of emotions on the constructed emotions view, I attempt to frame the discussion in an emotion-theoretically neutral way here. However, the arguments presented below are equally well applicable to emotional categories specifically encoding happiness, sadness, etc. If this must be the case though, it is even less clear that we should expect to find such categories, any more so than we expect to find categories encoding the specific notions of 'yesterday' or 'tomorrow', for example (see Wiltschko's description of the characteristic properties of grammatical categories in Section 3.2.1, pp. 14–16).

The first issue is tied with the assumption that the functional items/layers of the universal hierarchy are obligatory (once acquired), a view which is rather standard for grammatical structure and one which Wiltschko seems to be leaning towards also in the current context (p. 30). If so, Emo$_{[\text{VALENCE: POSITIVE/NEGATIVE}]}$ would necessarily be part of every linguistic derivation. However, since propositions expressed on a daily basis need not be associated with any emotion, the [VALENCE] feature would need to have the option of being left unvalued throughout the derivation, creating a potential interpretability issue, at least on some approaches to grammatical features (Pesetsky & Torrego 2004). This option seems to also be inconsistent with Wiltschko's assumptions about grammatical derivations, since while her coincidence feature can enter the derivation unvalued, at some point during the derivation it 'must be valued for the derivation to converge' (Wiltschko 2014: 157), which would need to not be the case in the scenario discussed here. Moreover, an unvalued [VALENCE] feature would also raise different types of economy-related questions, given that languages have a number of optional means of expressing emotions when needed.

Second, as Wiltschko notes (p. 8), describing emotions linguistically requires conscious awareness, which I take to imply that including Emo$_{[\text{VALENCE: POSITIVE/NEGATIVE}]}$ in a linguistic derivation would too. However, awareness of our emotions does not seem to come automatically; sometimes it requires conscious effort (including years in a therapist's office), making our actual emotions a rather unlikely candidate for encapsulation in a linguistic atom. Emotional numbness can also be a key component of dealing with trauma (e.g., Frewen et al. 2011; Gasper et al. 2019), hence forcing our emotions into conscious awareness whenever linguistic structure is generated could in fact be maladaptive at the level of the organism, but probably also at the social level (just imagine being forced by the grammar to be explicit about your emotions in all linguistic interactions, even if you could misrepresent them or leave them underspecified; see Dezecache et al. 2013 and references therein for some relevant discussions of emotion signalling). The computational burden of having to process emotional information whenever language is used is yet another factor potentially militating against emotions entering the grammar, at least as its obligatory component.

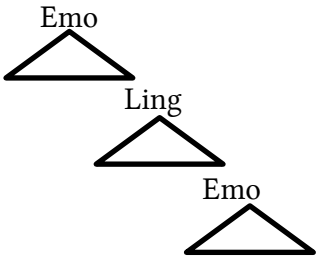
Third, the value of the [VALENCE] feature on Emo would need to be dissociable from the valence of the emotion actually generated by the speaker at a particular moment. Just as one can misrepresent one's actual epistemic state linguistically (e.g., lie about one's actual wishes or degree of certainty), as hinted above, it would need to be possible to misrepresent one's emotional state. It is thus crucial to specify how exactly an Emo category would be introduced into the lexicon, and how, say, the Mood category was introduced, given that epistemic states likewise probably arise as a result of complex computations. However, the logic of Wiltschko's argument makes the prediction that epistemic states (both speaker-oriented grounding and addressee-oriented grounding in Wiltschko's terms) are not generated by the grammar (or any other generative mental system outputting complex hierarchical representations) and should be 'basic' states, by analogy to basic emotions. Still, grammatical categories, while treated as atoms in syntactic computation, are also usually conceived of as (more or less) internally complex feature structures, so it's hard to dismiss out of hand the possibility that such feature structures could encode the output of a complex emotion derivation, just as they could encode a basic emotion. What is thus needed is an explicit model of how a mental construct enters grammar, allowing for a distinction to be made between epistemic and emotional states, one major unclear factor at this

point being whether the epistemic states entered grammar as representations of our actual mental states, or rather as grammaticalizations of labels for our folk psychological concepts. It seems that for Wiltschko's approach to be applicable, the former needs to be the case,[3] while the latter seems unlikely to offer a path towards understanding the difference, even though my impression is that a potentially relevant factor could be that both language and epistemic states are likely generated by purely cognitive systems, whereas emotions also integrate, among others, physiological responses (e.g., hormonal signals), potentially requiring additional intermodular and intermodal translational procedures for the components of emotion representations to interact with language directly (it is actually not clear if Wiltschko intends to retain or abandon modularity of the mind (an approach prominent in cognitive science since the publication of Jerry Fodor's 1983 book *The modularity of mind: An essay on faculty psychology*; see also, e.g., Barrett and Kurzban 2006, Seok 2006, Gottschling 2019 and Wang 2025 for useful discussions).

The fourth aspect of the proposal, whose specification could yield interesting conclusions for the study of the mental lexicon as well as of grammar, presupposes Wiltschko's model of constructing emotions and involves asking (i) what exactly the building blocks of the contentful hierarchy encode when emotions are constructed; (ii) why they cannot be associated with a phonemic matrix like the building blocks of sentences, opening up the possibility for arbitrariness in emotion expression; (iii) whether a hierarchy constructing an emotion could embed not only another hierarchy constructing another emotion (Section 5.2), but also a hierarchy constructing a sentence; (iv) whether there could be a single hierarchy mixing emotional and linguistic functional projections.

If the building blocks of the emotional hierarchy could be associated with a phonemic matrix (ii) and if the output of a linguistic derivation could serve as input to emotional derivation (or vice versa) (iii) or there could be mixed emotional/linguistic hierarchies (iv), we could expect to see phonemic strings externalising a mixed emotional/linguistic representation. Part of such a representation, for example as schematised in (2), could then be understood in terms of grammatical emotional categories, formally indistinguishable from grammatical linguistic categories, since all components of the representation would basically be information bundles providing instructions for processing by the sensory-motor system and for interpretation by the conceptual-intentional system.

(2)



[3] Note that even if Wiltschko's approach to constructing emotions is on the right track, this still does not explain why words like 'happy' are not grammaticalized, regardless of whether they individuate an actual mental state or are just reflexes of our folk psychological concepts. In other words, while one could accept the premise that constructed emotions cannot be encapsulated to form grammatical categories (or even lexical ones, for that matter), Wiltschko's discussion does not address the question why folk psychological labels like 'happy' (or 'positive') do not seem to be grammaticalized either, making it unclear if whatever explanation can be offered here would not equally well apply to constructed emotions too.

Clearly, (ii) and/or (iii)/(iv) seem to be blocked, but at this point there doesn't seem to be an obvious reason why. Alternatively, perhaps the co-externalisation of emotions by facial expression or tone of voice, for example, when producing a sentence could be considered in this light, though an issue here would be that the emotion can have nothing to do with a particular proposition expressed linguistically, but can instead be, for example, anger directed at the addressee (X is angry at Y, Y asks the time, X's answer comes with a tone of voice and facial expression associated with anger), which is probably not how we would expect the embedding scenario to operate. Either way, ultimately the absence of grammatical emotional categories (whether serving as input to a fully emotional computation or a mixed emotional/linguistic one) appears to stem from the lack of association with a phonemic matrix of the items which grammar manipulates in constructing emotions (as per Wiltschko's approach). The question is then what precludes this. A potential direction for an answer may possibly be found at the crossroads of the non-discreteness (Emonds 2011) and the infinitude of emotions, an investigation of which requires prior hypotheses about what the building blocks of emotions are (or is it just clay?), bringing us back to (i) above.

Three final notes which I would like to make here are as follows.

First, viewed from a broader perspective of approaches assuming universal syntactic structure, it isn't clear that complexity should be an insurmountable obstacle for emotions to enter grammar. Nanosyntax, for one, assumes that single grammatical categories can realise multiple syntactic feature bundles (a.k.a. syntactic heads; see Starke 2009; Taraldsen 2019), which could be applied to an emotional hierarchy, if its features could be associated with a phonemic matrix (i.e., if there could be Emo Vocabulary Items).[4]

Second, as noted above, Wiltschko's research programme implies that such cognitive states as surprise or desire, which are associated with grammatical categories in some languages (see Wiltschko's Section 3.3, pp. 18–28), are not constructed. However, once one assumes that the universal hierarchy is at the core of representing linguistic expressions and emotions, and that it can potentially be extended to other cognitive faculties (Wiltschko's Section 6, pp. 44–49), it doesn't seem outright improbable that it could be applicable to generating epistemic states (with their different flavours summarised in Wiltschko's Table 1, p. 29), whose representations are likely also complex. But then, by Wiltschko's logic, they should be blocked from entering the grammar too, contrary to fact. What is thus needed is a clear proposal about why linguistic structures and emotional states are generated by the grammar, but epistemic states cannot (or, at a minimum, need not) be. A statement to this effect, though, may undermine to some extent the Ockham's razor argument for unifying the linguistic and emotional systems, unless a principled independent property of these two implicating the hierarchy/grammar can be defined and shown to be absent from the belief/knowledge/desire system(s).

Third, intuitively it seems that the construction of emotions may require a reversal of Wiltschko's hierarchy, with classification of a state as positive or negative being possible only once all other types of information are incorporated (the same trigger can be interpreted as positive or negative depending on context, e.g., the sensation of an elevated heart rate while

[4] As a sidenote, I add that approaches assuming universal hierarches of syntactic feature bundles (heads), such as Wiltschko's universal hierarchy (spine) hypothesis (Wiltschko 2014, 2021), cartography (Cinque 1999, Cinque & Rizzi 2008), or nanosyntax (Starke 2009; Taraldsen 2019) are not at this point universally accepted in syntactic theorizing.

relaxing on a couch, which could trigger anxiety/fear vs. while exercising at a gym, in which case it can be part of a positive experience).

2.2 Neurocognitive predictions

In Section 6.2 (pp. 46–48), Wiltschko touches upon some possible routes for testing her approach empirically.[5] However, this cannot really be done without introducing additional crucial linking hypotheses, also referred to as linking propositions among other terms (see Teller 1984 for a history and characterisation of the concept, and see Poeppel 2012, Embick & Poeppel 2015 and related for discussions in the context of studying language), missing at this point. In the case at hand, these would be claims about the links between the elements of Wiltschko's model and neurophysiological states that would likely need to be mediated by explicit assumptions about the mappings between the model and the analytical levels of language and emotion processing. The non-trivial mappings between the elements of the processing theory and the concepts used in brain sciences would thus also need to be in place before any neurophysiological predictions could be meaningfully considered. Accordingly, even though Wiltschko notes some positive correlations between linguistic and emotional behaviours, there is no way of evaluating the proposal in light of such correlations or a lack thereof, because the theory of the linguistic/emotional grammar is incomplete (as discussed above) and no explicit theory of the language and emotion processing systems, or the theory of, broadly speaking, how the brain implements the mind is formulated.[6] While Wiltschko includes neurological predictions in the discussion, suggesting that '[i]f the same architecture underlies language and emotions, we predict the co-activation of language regions in the brain during emotion experience […]' (p. 46–47), there are two issues here.

First, there are both one-to-many and many-to-one mappings between mental processes and brain activation patterns (for a useful discussion, see, e.g., McCaffrey & Wright 2022 and references therein).[7]

Second, it is not entirely clear how to interpret in the present context the claim that 'the same architecture that underlies the grammar responsible for the construction of complex linguistic expressions also underlies the construction of emotions' (p. 3), since, barring further assumptions and linking hypotheses, 'the same grammatical architecture' could be implemented in different neural networks/different brain regions, depending on whether a clause or an emotion is being constructed.

To illustrate this point more concretely, one could assume Matchin and Hickok's (2020) neuroanatomical model of syntactic computation, which postulates that hierarchical lexical-syn-

[5] Some additional avenues that may provide fruitful testing ground include psychopathy, especially interesting from the perspective of the interactional portion of the hierarchy, as well as brain lesion and pharmaceutical studies (esp. with MDMA, exogenous androgens, and antiepileptic drugs).

[6] As an anonymous reviewer reminds me, Wiltschko cites Kristen A. Lindquist's (neuro)cognitive research on the relation between language and emotions. However, this work focuses on emotion word semantics and emotion conceptualization and its relevance to Wiltschko's grammatical proposal has not been made explicit. Additionally, as Lindquist (2017) herself points out, the neural evidence remains correlational and circumstantial, and my impression is that the issue of adequate hypotheses linking neuroscience and cognition is largely overlooked in this domain of inquiry as well.

[7] Complicating the matters further, even with these concerns resolved, testing the hypotheses empirically will also run up against the problem of the variability (lack of reliable biological correlates) of (folk) emotions (see Majeed 2023 and references therein).

tactic processing is implemented in the posterior middle temporal gyrus (pMTG). What could we then conclude from a study showing that pMTG participates in emotion processing? Unfortunately, not much, due to the generally observed lack of one-to-one correspondence between mental processes and brain structures noted above. Conversely, would Wiltschko's main hypothesis be considered falsified based on a study showing that pMTG does not participate in emotion processing? Probably not, since there would still be the possibility that her 'contentful hierarchy' is implemented in different brain structures depending on whether the linguistic or the emotional system is at work. Moreover, there are, of course, various additional architectural options for consideration, such as the idea that a general representation of the 'contentful hierarchy' is stored in one brain region/network/neuron (e.g., predicting some correlations between linguistic and emotional behaviours; though see the cautionary notes in Poeppel & Idsardi 2022), but the actual processing of language is located in a different brain structure than the processing of emotions, both of which access the stored information.

All in all, while I agree that there should ultimately be neurocognitive predictions here, a lot needs to be clarified before they can be formulated precisely and, unfortunately, they don't seem to be testable in practice at this point.

3 Final thoughts

As noted at the outset, Wiltschko's article inspires a multitude of avenues for further exploration. Among these are also: (i) whether the emotional system is formally infinite—akin to language—or merely practically unbounded, and if formally infinite, whether recursion rather than non-discreteness is the appropriate modelling mechanism; (ii) why one can generate a particular sentence at will without contextual prompting, whereas genuine emotions cannot be similarly summoned; and (iii) why the output of an emotional derivation can be decoupled from its expression (e.g., faking a smile while feeling anger), whereas linguistic derivations appear to lack such freedom in their sensory-motor realisation (i.e., they need to be externalised with the phonemes associated with the lexical items used, rather than with any other sounds or gestures).

Zooming out from the specifics of Wiltschko's proposal and echoing the perspective of Emonds (2011), a promising starting point for understanding the absence of grammatical emotional categories or features may lie in the non-discreteness of emotions. Moreover, some other factors which may preclude emotions from entering the grammar could include the intermodular and intermodal nature of cognition and physiology—including interactions with the endocrine system—and the potentially maladaptive consequences of integrating emotions into linguistic computation as its integral part. This is not to imply that emotions cannot be constructed in the way Wiltschko proposes, but rather that the current stage of the proposal leaves open several questions that merit further investigation. Interestingly, Wiltschko's framework may represent a significant improvement over Barrett-style constructionism, which conceptualises emotions as socio-culturally determined situational categorisations of affect (Barrett 2006 et seq.). While this approach has yielded valuable insights into the nature of emotions, it also presents certain limitations (Pober 2018, Majeed 2023 and references therein), which Wiltschko's ideas might help to address.

To summarise, the central conclusion that Wiltschko (2024) draws from her insightful investigation is that linguistic evidence supports the theory of constructed emotions. The comments offered here aim to show that substantiating this conclusion requires further clarification and

development—an endeavour that Wiltschko herself explicitly acknowledges (p. 34). Hopefully, at least some of the reflections presented above may contribute constructively to that ongoing effort.

References

Barrett, H. Clark & Robert Kurzban. 2006. Modularity in cognition: Framing the debate. *Psychological Review*, 113. 628–647. https://doi.org/10.1037/0033-295X.113.3.628.

Barrett, Lisa Feldman. 2006. Solving the emotion paradox: Categorization and the experience of emotion. *Personality and Social Psychology Review* 10, 20–46. https://doi.org/10.1207/s15327957pspr1001_2.

Cinque, Guglielmo. 1999. *Adverbs and functional heads: A cross-linguistic perspective*. Oxford: Oxford University Press. https://doi.org/10.1093/oso/ 9780195115260.001.0001.

Cinque, Guglielmo & Luigi Rizzi. 2008. The cartography of syntactic structures. *CISCL Working Papers on Language and Cognition* 2. 43–59.

Dezecache, Guillaume, Hugo Mercier & Thomas C. Scott-Phillips. 2013. An evolutionary approach to emotional communication. *Journal of Pragmatics* 59. 221–233. https://doi.org/10.1016/j.pragma.2013.06.007.

Embick, David & David Poeppel. 2015. Towards a computational(ist) neurobiology of language: Correlational, integrated and explanatory neurolinguistics. *Language, Cognition and Neuroscience* 30. 357–366. https://doi.org/10.1080/ 23273798.2014.980750.

Emonds, Joseph E. 2011. From primate to human in two easy steps. In Nicholas Saul & Simon James (eds.), *The evolution of literature: Legacies of Darwin in European cultures*, 43–69. Amsterdam: Rodopi.

Fodor, Jerry A. 1983. *The modularity of mind: An essay on faculty psychology*. Cambridge, MA: MIT Press. https://doi.org/10.7551/mitpress/4737.001.0001.

Frewen, Paul A., David J. A. Dozois, Richard W. J. Neufeld, Richard D. Lane, Maria Densmore, Todd K. Stevens & Ruth A. Lanius. 2011. Emotional numbing in posttraumatic stress disorder: A functional magnetic resonance imaging study. *The Journal of Clinical Psychiatry* 72. 431–436. https://doi.org/10.4088/jcp.10m06477.

Gasper, Karen, Lauren A. Spencer & Danfei Hu. 2019. Does neutral affect exist? How challenging three beliefs about neutral affect can advance affective research. *Frontiers in Psychology* 10. 1–11. https://doi.org/10.3389/fpsyg.2019.02476.

Gottschling, Verena. 2019. Modularity. In *The Routledge companion to philosophy of psychology*, 296-321. London: Routledge. https://doi.org/10.4324/9780429244629-18.

Jijina, Parisha & Urmi Nanda Biswas. 2021. Understanding equanimity from a psychological perspective: Implications for holistic well-being during a global pandemic. *Mental Health, Religion & Culture* 24. 873–886. https://doi.org/10.1080/ 13674676.2021.1952970.

Lindquist, Kristen A. (2017). The role of language in emotion: Existing evidence and future directions. *Current Opinion in Psychology* 17. 135–139. http://dx.doi.org/doi:10.1016/j.copsyc.2017.07.006.

Majeed, Raamy. 2023. Does the problem of variability justify Barrett's emotion revolution? *Review of Philosophy and Psychology* 14. 1421–1441. https://doi.org/10.1007/s13164-022-00650-0.

Matchin, William & Gregory Hickok. 2020. The cortical organization of syntax. *Cerebral Cortex* 30. 1481–1498. https://doi.org/10.1093/cercor/bhz180.

McCaffrey, Joseph & Jessey Wright. 2022. Neuroscience and cognitive ontology: A case for pluralism. In *Neuroscience and philosophy*, Cambridge, MA: The MIT Press. https://doi.org/10.7551/mitpress/12611.003.0019.

Pesetsky, David & Esther Torrego. 2004. The syntax of valuation and the interpretability of features. Ms., Massachusetts Institute of Technology and University of Massachusetts Boston.

Poeppel, David. 2012. The *maps problem* and the *mapping problem*: Two challenges for a cognitive neuroscience of speech and language. *Cognitive Neuropsychology* 29. 34–55. https://doi:10.1080/02643294.2012.710600.

Poeppel, David & William Idsardi. 2022. We don't know how the brain stores anything, let alone words. *Trends in Cognitive Sciences* 26. 1054–1055. https://doi.org/10.1016/%20j.tics.2022.08.010.

Pober, Jeremy. 2018. What emotions really are (in the Theory of Constructed Emotions). *Philosophy of Science* 85. 640–659. https://doi.org/10.1086/699158.

Seok, Bongrae. 2006. Diversity and unity of modularity. *Cognitive Science* 30. 347–380. https://doi.org/10.1207/s15516709cog0000_52.

Starke, Michal. 2009. Nanosyntax: A short primer to a new approach to language. *Nordlyd* 36. 1–6.

Taraldsen, Knut Tarald. 2019. An introduction to Nanosyntax. *Linguistics Vanguard* 5. 20180045. https://doi.org/10.1515/lingvan-2018-0045.

Teller, Davida Y. 1984. Linking propositions. *Vision Research* 24. 1233–1246. https://doi.org/10.1016/0042-6989(84)90178-0.

Wang, Xiao-Jing. 2025. *Theoretical neuroscience: Understanding cognition*. Boca Raton: CRC Press.

Wiltschko, Martina. 2014. *The universal structure of categories: Towards a formal typology*. Cambridge: Cambridge University Press. https://doi.org/10.1017/ CBO9781139833899.

Wiltschko, Martina. 2021. *The grammar of interactional language*. Cambridge: Cambridge University Press. https://doi.org/10.1017/9781108693707.

Wiltschko, Martina. 2024. Emotions do not enter grammar because they are constructed (by grammar). *Language Under Discussion* 7. 1–62. https://doi.org/10.31885/ lud.7.1.261.