UNIVERSITÉ Concordia UNIVERSITY

CARLA 2023

CONCEPTS IN ACTION: REPRESENTATION, LEARNING, AND APPLICATIONS

CONCORDIA UNIVERSITY, MONTREAL
AUGUST 23-25, 2023

CARLA 2023 (Concepts in Action: Representation, Learning, and Applications)
Concordia University, Montreal
August 23-25, 2023
cognition.lab@concordia.ca

Local organizers

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Kyan Salehi
Paul E. Stan
Helen Valkanas

List of sponsors

This workshop is supported by the following Concordia University Departments and Institutes:

Department of Psychology
Applied AI Institute
Department of Philosophy
Department of Classics, Modern Languages, and Linguistics
School of Graduate Studies
Psycholinguistics and Cognition Lab

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Schedule

DAY 1 – WEDNESDAY (AUGUST 23)

15:00 – 16:00: Registration

16:00 – 16:15: Opening Remarks

Keynote Session 1: Philosophy of Mind [Session Chair: Christopher Genovesi]

16:15 – 17:15: John Perry (Stanford University) – Self-Concepts: Primitive and Robust

17:15 – 19:00: Cocktail Reception & Poster Session

Alessandro La Serra (Concordia University), Caitlyn Antal (McGill University), & Roberto G. de Almeida (Concordia University) – From perception to meaning: The role of color and texture in the early stages of conceptual access

Cedric Le Bouar & Roberto G. de Almeida (Concordia University) – Pre-lexical morphological parsing of ambiguous roots: Evidence from a cross-modal task

Paul E. Stan & Roberto G. de Almeida (Concordia University) – Do concepts decompose? Evidence from a memory-for-propositions task

DAY 2 – THURSDAY (AUGUST 24)

08:30 – 09:15: Morning Coffee & Pastries

09:15 – 09:30: Opening Remarks

Keynote Session 2: Cognitive Neuroscience [Session Chair: Tobias Ungerer]

09:30 – 10:30: Alex Clarke (University of Cambridge) – The Neural Dynamics of Meaningful Object Recognition

10:30 – 11:00: Coffee Break

Talk Session 1: Semantic Priming [Session Chair: Tobias Ungerer]

11:00 – 11:30: Kyan Salehi & Roberto G. de Almeida (Concordia University) – Accessing concepts from (pseudo)constituents of words

11:30 – 12:00: Larissa Jordan (University of Cincinnati) & Kristi Hendrickson (University of Iowa) – The nature of automatic semantic retrieval in individuals with mild cognitive impairment

12:00 – 12:30: Caitlyn Antal (McGill University) & Roberto G. de Almeida (Concordia University) – What do we grasp at a glance? Investigating conceptual representations through rapid object categorization

12:30 – 14:00: Lunch Break

Keynote Session 3: Conceptual Development [Session Chair: Christopher Genovesi]

14:00 – 15:00: Alan Bale (Concordia University) – Nominal Concepts and Quantities

15:00 – 15:30: Coffee Break

Talk Session 2: (Psycho)linguistics [Session Chair: Christopher Genovesi]

15:30 – 16:00: Craig Chambers & Tiana Simovic (University of Toronto) – Conceptual content and real-world coreference

16:00 – 16:30: Tobias Ungerer (Concordia University), Caitlyn Antal (McGill University), & Roberto G. de Almeida (Concordia University) – Conceptual integration in creative sentences: Evidence from eye-tracking

16:30 – 17:00: Mikihiro Tanaka (Konan W. University) – From concept to syntax in production: Evidence from coercion and metonymy

17:00 – 17:30: Jonathan Kendrick (University of Maryland) – The dynamics of open texture

19:00: Workshop Dinner

Location: Wienstein & Gavino's

DAY 3 – FRIDAY (AUGUST 25)

08:30 – 09:15: Morning Coffee & Pastries

09:15 – 09:30: Opening Remarks

Keynote Session 4: Artificial Intelligence and Symbol Grounding [Session Chair: Tobias Ungerer]

09:30 – 10:30: Stevan Harnad (Université du Quebec à Montreal) – What ChatGPT lacks: How do words get their meaning?

10:30 – 11:00: Coffee Break

Talk Session 3: Philosophy of Language and Mind [Session Chair: Tobias Ungerer]

11:00 – 11:30: Majid Amini (Virginia State University) – Fodor on concepts and language: Evolutionary (dis)continuity?

11:30 – 12:00: Christopher Genovesi (Concordia University) – Remarks on the literal-metaphorical distinction and lexicalized concepts

12:00 – 12:30: Jie Chen (Rice University) – Cross-category notions, representations and Aristotle's essentialism

12:30 – 14:00: Lunch Break

Keynote Session 5: Distributional Social Semantics [Session Chair: Caitlyn Antal]

14:00 – 15:00: Brendan Johns (McGill University) – Grounding Computational Models of Language in the Social Environment: A New Direction for Models of Language Processing

15:00 – 15:30: Coffee Break

Talk Session 4: Social Semantics and Concepts in Action [Session Chair: Caitlyn Antal]

15:30 – 16:00: Dominik Hetjens (TU Dresden) & Stefan Hartmann (University of Düsseldorf) – Will Carla apply for this job, or just Carl? – What user interactions with job listings reveal about the effects of gender-sensitive language on male and female representations

16:00 – 16:30: Stephanie Rotter & Mingya Liu (Humboldt-Universität zu Berlin) – Social meaning of negative concord in American English

16:30 – 17:00: Beth Barker (Northwestern University) – Propositions in action

Keynote Session 6: Pragmatics/Semantics Interface [Session Chair: Roberto G. de Almeida]

17:00 – 18:00: Brendan Gillon (McGill University) – Concepts and words: How do they relate to one another?

18:00 – 18:15: Closing Remarks

Practical Information

Venue and map

CARLA 2023 will take place at the Concordia University Conference Centre, Sir George Williams campus, downtown Montreal.

Address: 1450 Guy Street, Montreal, QC H3H 0A1

Conference venue

MB building

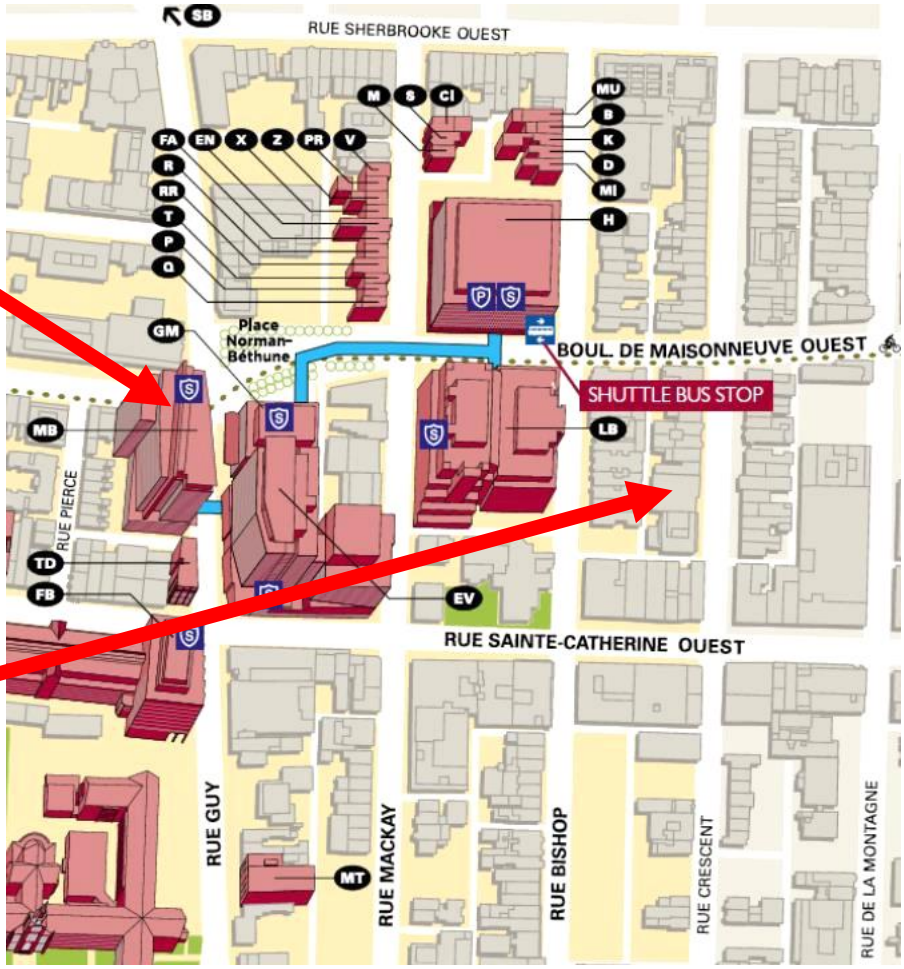
9th floor

Room 9.225

Conference dinner (Thursday)

Wienstein & Gavino's

1434 Crescent St



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Username: johnsmith@concordia(dot)ca Password: xxxxxxxxxx

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Emails and phone numbers

Local organizers: cognition.lab@concordia.ca
University security: +1 (514) 848-371
Police and Ambulance: 911
Non-urgent health issue: 811

Transportation around Montreal

The STM is Montreal's public transportation system for metro and bus. The metro station closest to the university is Guy-Concordia.
Information about metro fares and routes can be found under
https://www.stm.info/en/info/networks/metro.

Food and beverage options around the workshop venue

Liv Salades (Vegetarian)
1444 B Saint-Catherine St W, Montreal, Quebec H3G 1R3

McKibbin's (Pub)
1426 Bishop St, Montreal, Quebec H3G 2E6

Sir Winston Churchill Pub
1455 Crescent St, Montreal, Quebec H3G 2B2

3 Brasseurs (Bistro & Pub)
1356 Saint-Catherine St W, Montreal, Quebec H3G 1P6

La Belle & la Boeuf (Burger Bar)
1620 Saint-Catherine St W, Montreal, Quebec H3A 1L9

Burger Bar Crescent
1465 Crescent St, Montreal, Quebec H3G 2B2

Asoo Restaurant (Persian)
1620a Sherbrooke St W, Montreal, Quebec H3H 1C9

Chez Hailar (Pizza/Persian/Halal)
1612 Sherbrooke St W, Montreal, Quebec H3H 1C9

Nominal Concepts and Quantities

Alan Bale (Concordia University)

In this talk, I will discuss potential answers to the following three questions: 1) What are the smallest parts that fall within the denotation of a given count noun? 2) What counts as an individual (one unit) with respect to a given count noun? 3) What types of measurements/comparisons are licensed by a count noun? Traditional approaches to the mass-count distinction have hypothesized that the answers to these three questions are interconnected. The smallest parts that fall within the denotation of a count noun are the individuals. Furthermore, the denotations of count nouns are measured and compared by counting the number of individuals contained within them. Lately, this traditional approach has come under much scrutiny, both within the theoretical and experimental literature. Data concerning numeral modification, in particular fractional modification such as *two and a half apples*, raises the issue of whether "subatomic" parts are included in the denotation of count nouns (e.g., see Haida & Trinh 2021, Snyder & Barlew 2019). Furthermore, the truth conditions invoked by *many*, *more* and *most* suggest that there is much greater flexibility in the way count nouns are measured and compared: counting is not the only measurement available (e.g., see Bale & Schwarz 2019, Winter 2022). Finally, recent experimental studies on counting within the developmental literature suggest that perhaps the notion of a "unit" is determined pragmatically rather than by some inherent grammatical/conceptual feature within the noun itself (e.g., see Syrett & Aravind 2022, Srinivasan, Li & Barner 2015). In light of this kind of data, I will discuss various ways that the traditional link between units, minimal parts and measurement can be re-imagined.

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Snyder, Eric and J. Barlew (2019). How to Count 21/2 Oranges. Australasian Journal of Philosophy 97.4, 792–808.

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The Neural Dynamics of Meaningful Object Recognition

Alex Clarke (University of Cambridge)

Visual object recognition is a highly dynamic neural process through which we extract meaningful information about the things we see. Drawing on different neuroimaging techniques, I will show that different brain regions in the ventral visual pathway contribute to different aspects of vision and semantics, that visual and semantic processes have distinct temporal dynamics, and highlight how neural connectivity dynamics might underpin the transition between visual and semantic representations in the brain. This points towards a dynamic and interactive model of object recognition, where feedforward and recurrent connectivity support distinct aspects of vision and semantics. However, our neurocognitive models must also accommodate how our visual surroundings shape semantic processing. When we see an object, we are already in a complex and rich environment, and this leads to expectations about the things we are likely to see. Our recent EEG and MEG work shows that the semantic processing of visual objects is shaped by the prior scene context, while our behavioural research shows that our memories for objects are modulated by both the object's context, and the semantic structure of objects themselves. Finally, I will discuss our approach that utilises emerging mixed-reality and mobile brain imaging technologies to study perception in real-world settings, unconstrained by the lab. Together, these lines of research highlight that semantics is a core part of object recognition, and that semantic processing shapes what we will later remember, and is shaped by the prior context.

Concepts and Words: How Do They Relate to One Another?

Brendan S. Gillon (McGill University)

It is not unusual to see the name for a concept written as a word in small caps. For example, the name for the concept for what we express using the word ‘table’ might be written ‘TABLE’. This raises the question: just which features of a word are pertinent to the concept it names. Surely, a word’s phonology is not pertinent. Nor presumably, in languages with non-notional gender, is non-notional gender. The fact that ‘table’ in French is feminine, a feature of the word, is not a feature of the concept of TABLE. In contrast, surely the concept expressed by the relational noun ‘parent’ is relational. Are concepts relational just in case the corresponding words are relational? If so, then to know which concepts are relational and which are not, we must know which words are relational and which are not; and if a word is relational, does it denote a binary, ternary or quaternary relation? And what do we say about words which appear sometimes to denote a binary relation and sometimes a simple property? The aim of the talk is first to explain the problem posed by words which seem to denote both a simple property and a relation or a binary relation and a ternary relation and second to propose a solution which applies to a broad range of cases found across a number of languages.

What ChatGPT Lacks: How Do Words Get Their Meaning?

Stevan Harnad (Université du Québec à Montréal)

To pass the "Turing Test" a system has to be able to talk to you indistinguishably from a normal human. Does ChatGPT pass the T-test? If not, why not? This is the "symbol grounding problem." Words have *referents* ("apple" refers to apples) and "meanings" (an apple is "a round, red fruit"). How do words get connected to their referents? and how do they get their meanings? Some words get connected to their referents *directly*, through sensorimotor category learning, by trial, error and feedback. Most words get connected *indirectly*, through words, by descriptions or definitions. Look in a dictionary and you'll see that *most words could not be connected to their referents directly*. How would you learn what "abstract" or "anarchic" means by sensorimotor trial and error? It has to be defined for you in words. All words can be defined in words. But to learn from a definition you need to already know the meaning of the words used to define it. So you cannot learn all your words indirectly, through words. Some of them must be learned directly, from sensorimotor experience. Which words? And how many? I will describe (1) how human participants and machine models can learn sensorimotor categories directly through reinforcement learning, (2) how this can change their perception ("categorical perception") and (3) how dictionaries can be shrunk to their "minimal grounding sets," the smallest number of words (about 1500) that can define all their other words.

Grounding Computational Models of Language in the Social Environment: A New Direction for Models of Language Processing

Brendan Johns (McGill University)

Linguistic experience varies across individuals and is impacted by both demography and personal preferences, leading to differences in word meanings across people. An active area of study in the cognitive sciences that examines the impact of varied knowledge across individuals is the wisdom of the crowd effect, where it is found that the aggregate judgement of a group of individuals is often better than the judgement of the best individual. The goal of this talk is to demonstrate a wisdom of the crowd effect in lexical semantic memory, such that the aggregated word similarity values from many individual language users exceeds the fit of the best fitting individual. This was accomplished by training 500 different distributional models from 500 high-level commenters on the internet forum Reddit. By deriving aggregated word similarity values across individuals, a strong wisdom of the crowd effect was found where the aggregated similarity values exceeded the performance of the best fitting individual for each dataset tested. Additionally, it was found that even aggregating only a small number of users provided a large increase in fit relative to the individual corpora, but with the best fitting measure including word similarity values from all possible users.

Self-Concepts: Primitive and Robust

John Perry (Stanford University)

I will distinguish between primitive and robust concepts of one's self. Primitive self-concepts don't include an idea of the agent. They are simply ideas of the complex of properties the agent has learned itself to have through normally self-informative states, like perception and interoception. This is all lots of animals seems to have. When a hen sees a kernel of corn a bit in front of her in a barnyard, she gets information about the kernel of corn, but also about herself. We as theorists would say she learns that there is a bit of corn in front of *her.* We need a word for the hen. But she doesn't. If she spoke English, she could just think: Lo, a piece of corn.

But a hen has to keep track of the various animals in the barnyard and treats them differently based on her experience. She flees from mean roosters but not from docile chickens. Her concepts of these other animals need to keep track of which properties belong to which animals. For this she seems to need ideas of the various animals. So, such animals have a much different way of handling information about themselves than about others. But some animals pass the mirror test. They are "self-aware". This means they can pick up information about themselves in the way they pick up information about other animals. This seems to require something like an idea of themselves. This leads to what I call a robust self-concept, that combines information about the agent gained in self-informative ways with information about the agent gained in ways that are normally other-informative. We are such animals.

Fodor on Concepts and Language: Evolutionary (Dis)Continuity?

Majid Amini (Virginia State University)

In *The Language of Thought* Jerry Fodor puts forward a set of apparently *a priori* arguments to show that one cannot learn a language whose expressive power is greater than that of a language that one already knows. More specifically, he argues that one cannot learn a language whose predicates express extensions not expressible by those of a previously available representational system. This effectively disposes of the hypothesis testing account of language *learning* by demonstrating that everything must be innate. More importantly, the outcome appears to broach a breach in the evolutionary continuity of the emergence and genesis of language.

A significant number of linguists have found Fodor's argumentation, to say the least, *paradoxical*, but, as John Marshall, for example, notes, no one has yet brought forth a convincing counter-argument. In fact, the creolist Derek Bickerton thinks that the data from creole languages provide *a posteriori* evidence for the Fodorian *paradox*. Bickerton's version of the paradox runs thus: small children who could barely control their own bowel movements were capable of learning things of such abstractness and complexity that when brought to the level of consciousness, mature scholars often misanalyse them.

The purpose of this paper is, therefore, to probe the force of the Fodorian argument *vis-à-vis* the presumed evolutionary constraints on the origin of language. Specifically, the target of the paper is threefold. (1) To examine the validity of Fodor's central argument in order to show that the premises of the argument suffer from several ambiguities whose removal waters down his radical nativist conclusion, thus opening up a way of bridging the evolutionary gap in the process of language development. (2) To present a counter-argument against Fodorian nativism by looking at the process of *concept acquisition*. This obviously draws on an understanding of the nature of concepts and is done against the background of Fodor's theory of concepts as developed in his *Concepts*. (3) Finally, and rather *paradoxically*, to assay the applicability of evolutionary explanation to language in particular and cognition in general. There is a widely held view that natural selection is a sufficiently *fine-grained* process to exert an impact on cognitive capacities. Yet, despite the appeal of explaining cognition as the result of evolution through natural selection, there are serious qualms about administering evolutionary explanations to cognitive capabilities. Natural selection is often deemed to be too *coarse-grained* to be sensitive to such traits, and evolutionary explanations of cognition seem be founded at best on an analogy with biological evolution. Generally, the problem is that there may have been no direct natural selection for cognitive ability at all. Cognition may have developed as the purely epiphenomenal consequence of the major increase in brain size, which, in turn, may have been selected for quite other reasons. Should this line of reasoning turn out to be plausible, one may be able to maintain a moderate linguistic nativism without falling foul of evolutionary concerns.

Propositions in Action

Beth Barker (Northwestern University)

The debate about the nature of knowledge-how aims to capture both (1) whatever it is that's distinctively practical about an agent's state when they *know how to phi,* and (2) whatever it is that makes *being* in that state a kind of cognitive or epistemic achievement. These two elements of knowledge- how pull in two directions. Accounts that fare well by (1) allegedly *under-intellectualize knowledge-how,* and accounts that fare well by (2) allegedly *over-intellectualize knowledge-how.* So, the debate seems to be constrained by a Goldilocks problem: capture (1) and (2) by finding the just-right degree of intellect. Recent accounts of know-how have taken novel approaches to know-how in order to do exactly this (e.g., Löwenstein 2017 and 2020, Elzinga 2021, Habgood-Coote 2019). These accounts try to find the right degree of intellect by specifying the role that propositional attitudes play in knowing-how, or in actions that manifest know-how.

David Löwenstein suggests that so long as our theorizing does not *reduce* know-how to a kind of propositional attitude, we do not over-intellectualize know-how. Benjamin Elzinga suggests that any appeal to propositional attitudes as necessary for knowing-how over-intellectualizes know-how. And Joshua Habgood-Coote dismisses the worry about over-intellectualization as generally misguided. However, there has been no argument for, or principled explanation of, what it means to 'over- intellectualize' know-how, nor an argument to the effect that the worry is misguided. The task of determining whether an account is over- or under-intellectualized has fallen to our case-based intuitions (i.e., about whether only subjects who have *propositional* knowledge can have genuine know- how). In this paper, I show that we can do much better than rely on case-based intuitions. I propose and defend a notion of over-intellectualization that adjudicates the dispute about know-how.

I argue that recent accounts of know-how in general (and Löwenstein's and Elzinga's in particular) implicitly accept what I call 'internalism' about the nature of propositional attitudes. According to this internalism, *if* a proposition is relevant to an explanation of knowing-how, it is because it constitutes the structure of an agent's thought-in-action. I develop a Davidson-style (1991) argument to the effect that it is implausible that a proposition constitutes the structure of an agent's thought-in-action. A proposition is not an object "present to the mind" in all cases of action that manifests know-how. I conclude this argument with the observation that propositionally structured mental contents are not *necessary* for any account of what it means to act on one's know-how.

One should take this sub-conclusion as good news, because even if it *were* plausible that propositions structure the mental content that guides action, propositions would fail to do the explanatory work they were posited to do. The internalist about propositions confronts a vicious regress. The regress is one of application (inspired by Ryle 1946): it does not follow from an agent's having propositionally structured mental contents that the agent *acts* based on that content. To posit some structured mental state is to require an *application* (of some kind) of that mental state to the performance in question (see Small 2017). This is to say that a further explanation is needed: what bridges the gap between the agent's mental content and their performance of some action based on that content? Well, it can't be some further proposition—or propositionally structured mental content—or else the explanatory gap between proposition and action arises again.

I do not propose a bridge on the internalist's behalf because there is a better alternative to internalism. In conclusion I discuss what I call 'externalism' about propositions and show that it does not confront internalism's shortcomings. It turns out that know-how is over-intellectualized *not* in virtue of appealing to propositions, but in virtue of accepting internalism about propositions in action.

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Conceptual Content and Real-World Coreference

Craig Chambers & Tiana Simovic (University of Toronto)

Traditional approaches to discourse reference have assigned a central role to linguistically evoked concepts. For example, in File Change Semantics [1] and Discourse Representation Theory [2] (see Fig. 1), the interpretation of "*The woman bought a black car*" draws on a representation that indexes relevant entities in the universe of discourse, which in turn are understood to fall within the evoked conceptual categories and bear the stated properties. However, equally "classic" work has often noted that the nominal expressions used to achieve linguistic reference can in fact bear a loose relationship to real-world circumstances or abstract notions of truth. For example, the utterance "*Who is the woman drinking the martini?*" can be readily interpreted even when the addressee happens to know that the woman in question is in fact drinking plain water out of a cocktail glass. Thus, conceptual elements evoked in linguistic expressions are in some cases better understood as cues to reference rather than fully accurate characterizations of an entity's conceptual category or properties (cf. [3-7]). In the present work, we explore this theme further in the context of real-time referential processing. Critically, we employ manipulations where aspects of the referential context are altered between initial and subsequent expressions in a way that affects the validity of an earlier expression's linguistic content. The key question is whether or how these "updates" influence aspects of real-time interpretation. Our experiments use variants of the Visual World methodology in which gaze patterns are used to reveal listeners' moment-to-moment referential hypotheses at the millisecond level.

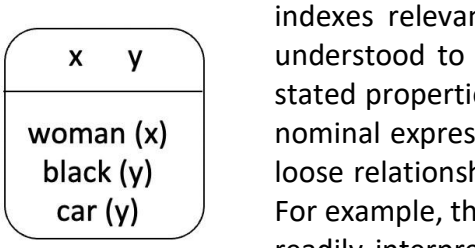

Fig 1. Partial discourse representation structure for referential expressions in *The woman bought a black car*.

Fig 2. Example display. Accompanying instructions:
i. Move the house on the left to [area 12]/[area 9]
ii. Now, move it to area 4.

Experiment 1 tests the assumption in the psycholinguistic literature that a pronoun preceded by an antecedent is interpreted via a process of retrieval (accessing the semantics of its antecedent in discourse memory). Listeners (N=24) followed a sequence of instructions relating to objects in a grid display (see Fig. 2). On critical trials, the initial instruction was of the type "*Move the house on the left to area 12*". Importantly, the outcome of this instruction is that moved house is now the rightmost one. If a subsequent instruction contains a pronoun (e.g., "*Now, move it to area 4"*), then a process that retrieves the semantics of the antecedent expression should entail processing difficulty because the expression no longer accurately describes the intended referent. (Even if intuitions suggest there is no confusion as to the referent's identity, gaze measures should capture some difficulty.) The key comparison case involves a condition where the antecedent semantics continue to be viable following the first instruction (e.g., house is initially moved to area 9). The results showed that not only did

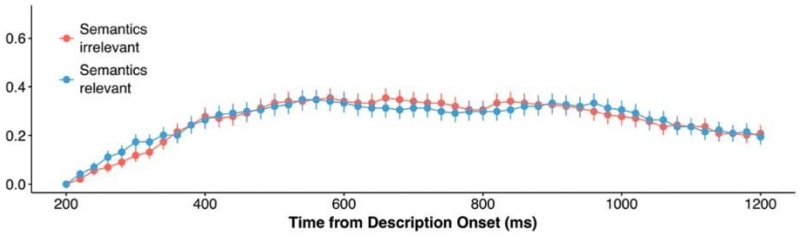

Fig 3. Fixation patterns over time at the pronoun is heard

listeners select the previously-moved object with no difficulty regardless of whether antecedent semantics continued to be viable when the pronoun was heard, but also that fixation profiles were identical (Fig. 3). This similarity was corroborated by Bayesian parameter estimation, taking into account fixations at each individual time step. These analyses showed that 100% of possible parameter values for the cross-condition difference fall within the region of practical equivalence. Thus, the properties evoked in the antecedent term appear to have little effect on pronoun interpretation, highlighting the notion that linguistic content is not relied on in an especially strong way (in turn making the notion of "retrieval" somewhat vacuous).

Experiment 2 (N=48) explored the extent to which the conceptualization expressed in an earlier referring description continues to influence referential processing after listeners' belief state is updated to reflect that the initial conceptualization was incorrect. Listeners heard descriptions referring to objects that were located behind panels that were either transparent or were a translucent color that distorted objects' actual color. For example, given the shelf display shown at the top in Fig. 4, listeners might hear *Click on the red pot*. At some point, the shelf display was rotated (Fig.4, bottom), which in turn updated participants' beliefs about selected objects (e.g., the red pot is in fact purple). The display is then rotated back to the original view (Fig. 4, top). The key question is how listeners' new knowledge influences their interpretation of a downstream description. To discourage listeners from recognizing the goal of the experiment, this was achieved by referring to an as-yet-unmentioned object (e.g., the red car in Fig 4). If, upon hearing "red" in "*Now click on the red car"),* listeners' eye movements show strong temporary consideration of the pot (relative to a condition with a genuinely red pot and a transparent panel), this outcome would indicate that listeners prioritize entities' in-the-moment depiction/state rather than their (newly-learned) actual nature. We also included an analogue condition ("version 2") where, e.g., the car was purple. If listeners genuinely prioritize the in-the-moment depiction/state rather than their actual nature, then, upon hearing "purple" in "*Now click on the purple car"),* listeners' eye movements should show little consideration of the pot (relative, once again, to a condition with a genuinely red pot and a transparent panel). These are the patterns observed (see Fig. 5).

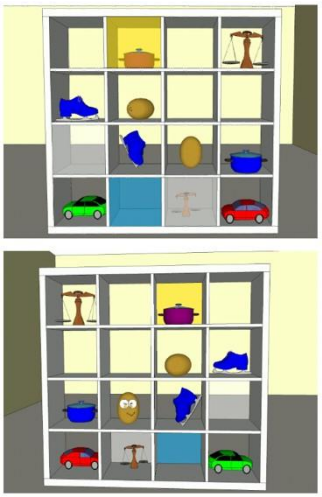

Fig 4. Example display showing shelf from opposite sides (at top: yellow translucent panel makes purple pot appear red)

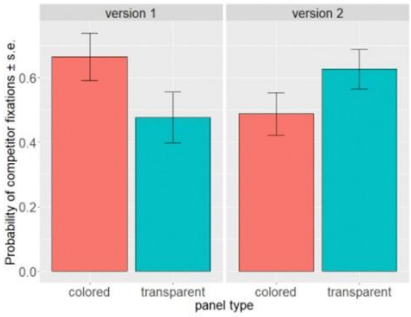

Fig 5. Likelihood of making a temporary fixation to earlier mentioned object.

Together, the results show that listeners' expectations for linguistic reference seem to prioritize a notion of "in-the-moment expediency" over "truth". This is reflected in both referential dependencies (Expt. 1) and in cases where listeners' knowledge is at odds with the apparent features of objects at the time of utterance (Expt 2). The processing patterns are nonetheless compatible with a range of theoretical studies that, to date, are arguably underappreciated in mainstream psycholinguistics [3,4,5,6,7,8].

1. Heim, 1982; **2**. Kamp & Reyle, 1993, *From Discourse to Logic*; **3.** Donnellan, 1966, *Philosophical Review*; **4.** Hobbs, 1987, *CSLI Report No. CSLI-87-99*. **5.** Reimer, 1998, *Linguistics & Philosophy*, **6.** Roberts, 1993, *How reference works;* **7**. Sperber & Wilson, 1986, *Relevance: Communication and cognition* **8**. Barwise & Perry, 1983, *Situations and Attitudes.*

Cross-Category Notions, Representations and Aristotle's Essentialism

Jie Chen (Rice University)

This paper aims to examine cross-category notions in Aristotle's works: notions that are not confined to a single category. Scholars have identified five or six specific cross-category notions: being (*Metaphysics* Γ, Δ, Z), unity (*Metaphysics* 1016b), actuality (*Metaphysics* 1048a36), matter and form (*Metaphysics* 1070b26), and good (*Nicomachean Ethics* 1096b13).[1] In what sense are they called cross-categorical? Besides, it is widely acknowledged among scholars that Aristotle's categories present not only a linguistic but also a metaphysical and ontological picture. What would be the metaphysical truth of things revealed by these cross-category notions? These are the main questions that will be discussed in the paper.

In the paper, I will examine three particular cross-category notions: being, actuality and good. The underlying assumption is that these notions are cross- categorical in the same sense. I use the term "cross-category" to signify a distinct perspective from the views that consider these notions as transcendental, the meaning of which has been discussed for a long history, as well as from the focal meaning view which regards the notions as primarily referring to one category, to which all other senses refer to. In my interpretation, cross-category notions do not possess a superior status or reside solely in one single category. Instead, they intersect with all categories, allowing things to be described beyond the limit of categories. By addressing these notions, I wish to present the possibility of crossing boundaries in alignment with Aristotle's essentialism.

Aristotle's *Categories* 4, 1b25 reads: "Of things said without combinations, each signifies either substance or quantity or quality or a relative or where or being-in-a-position or having or doing or being affected." The list of the categories has appeared in several works of Aristotle.[2] The processes of arriving at this list, either by posing various questions about a particular subject and receiving answers that align with the categories, or by asking a specific question, namely, "what is it" to everything and anything, encompass the genus-species structure and specify an individual-essence relationship.

Cross-category notions fall outside of this map. They cannot be identified as an ultimate genus, nor belong to a species. Take the notion of actuality as an example. There is no group of individuals called actuality, as a group of men called "men". Nor are there any inquiries concerning the actuality of an individual. One might expect cross-category notions to be purely linguistic concepts, defined not through the genus and differentia system used for items within categories, but through an account signified by the name or name-like expression, as suggested by Aristotle in *Prior Analytics* (93b29-31). This interpretation aligns with Aristotle's hesitation to provide a definition of actuality in *Metaphysics* 9.6.[3] Such interpretation excludes cross-category notions from inquiries pertaining to the existence of an object. Aristotle's way of defining actuality, as I will argue, does not designate actuality as a pure linguistic concept. Instead, similar to the notions of being and good, actuality can be applied to all categorical items and reveal truths about things that exist.

Notes

[1] For example: Hesse, M. (1965). *Aristotle's logic of analogy*. The Philosophical Quarterly (1950-), 15(61), 328-340. Beere, J. B. (2009). *Doing and Being: An Interpretation of Aristotle's Metaphysics Theta.* Oxford University Press. Ross does not list matter and form in his list.

[2] The only other place where the 10 categories are listed is *Topics* 1.9. The difference is that the first category is ti esti, not substance. Other places that list categories include: *Metaphysics* Beta 996b17-18, Delta 1017a22, 1045b29, 1069a21, Zeta. *Physics*. *Topics* 1.9 103b20-104a2. *De Anima* 402a24, 410a14. *APo* 83a21-24 (ti esti is a predication). *Politics* 1296b17. There are inconsistency on Arisotle's discussion of substance in the *Categories* and *Metaphysic* Z. For a consisten view, see. About the authenticity of Aristotle's *Categories*, see Frede 1983, 1987.

[3] 1048a36-37: "we need not seek a definition for every term, but must comprehend the analogy".

Remarks on the Literal-Metaphorical Distinction and Lexicalized Concepts

Christopher Genovesi (Concordia University)

I explore a recent attempt by Allot & Textor (2022) to preserve the literal-metaphoric distinction without recourse to (lexicalized) concepts. This talk expands upon some ideas discussed in a previous talk by Genovesi & Hesse (2023). The literal-metaphoric distinction reflects the intuitive idea that we routinely identify statements such as "the largest fish in the aquarium is a shark" as literal and "my lawyer is a shark" as metaphorical. We grasp the former by knowing the conventional meaning of the words uttered and the rules for their combination. The latter, however, we grasp by inferring what is meant beyond the conventional meaning. In other words, literal meaning is standard, metaphorical meaning is deviant. However, proponents of lexical pragmatics place metaphor on a continuum with literally loose uses of speech. Here, deviance is the rule, not the exception. This has led some (most notably, Sperber & Wilson, 2008) to abandon the literal-metaphorical distinction altogether. Allot & Textor (2017; 2022) develop and defend a version of the literal-metaphorical distinction that does not rely on lexicalized concepts and conventional word meaning. On their view, non-literal language use is contrasted with "originating use". The idea is reminiscent of Hobbes' notion of 'ordained' usage. As such, it is open to similar criticisms. Although I generally agree that there is a need to preserve the literal-metaphorical distinction despite the pervasiveness of lexical modulation. I offer some reasons for my disagreement. One major issue is the vagueness of the authors' use of the phrase "originating use". I canvass several possible candidate criteria for this phrase. I estimate that none are satisfactory for preserving the notion of deviance. I offer a notion of deviance based on a neoclassical understanding of concepts (Leben, 2015).

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Will Carla Apply for This Job, or Just Carl? – What User Interactions with Job Listings Reveal about the Effects of Gender-Sensitive Language on Male and Female Representations

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The question of whether the use of gender-sensitive language has a measurable impact on hearers and readers in evoking the conceptualization of female persons is probably among the most controversially debated issues in linguistics and beyond. This is especially true for studies on person reference in German. German is a gender language, i.e. each noun has a specific grammatical gender, which in the case of nouns referring to persons usually corresponds to biological and/or social gender: *Der Mann* 'the man (masculine)', *die Frau* 'the woman (feminine)', but also *das Mädchen* 'the girl (neuter)'. Role nouns typically exist in pairs in German (Diewald 2018), e.g. *der Linguist* 'the linguist (m.)' – *die Linguistin* 'the linguist (f.)'. In contexts in which the gender of the referent(s) is unknown or in which one refers to a group of referents of different genders, so-called masculine generics tend to be used in everyday language, e.g. *Linguisten sind klug* 'Linguists are smart'. However, it is a hotly debated question to what extent grammatically masculine forms are actually interpreted in the intended gender-neutral sense. A number of psycholinguistic studies suggest that the masculine form is more likely to elicit mental representations of men than of women, creating a male bias (e.g. Stahlberg et al. 2001, Gygax et al. 2008, Keith et al. 2022, Körner et al. 2022). A recent corpus study using distributional semantics has lent further support to this hypothesis (Schmitz et al. forthc.). It has been argued that this male bias can entail social consequences, which is a hypothesis that has been explored in a number of small-scale studies investigating the language used in job listings. For instance, the results of a hiring-simulation experiment by Horvath and Sczeny (2015) indicate that women who apply for a job are less likely to be perceived as fitting a position by potential employers if the text advertising the position uses masculine generics. Vervecken et al. (2013) found that female primary school students were less likely to state that they felt competent to do a specific job if the job description used only the masculine form.

To the best of our knowledge, no large-scale, data-driven study has been conducted so far that tests whether the use of gender-sensitive language in job listings also leads to an increased interest in the position by persons who identify as female. Our study aims at filling this gap. Based on data provided by the recruitment platform StepStone, we evaluate whether job advertisements using different kinds of gender-sensitive language in their job titles correlate with higher proportions of views by female users. Our data consist of 964,689 German language job listings that have been viewed 118,187,849 times altogether (mean = 121 views per listing, sd = 157.7). Importantly, these data allow for taking differences between various sectors into account, as different branches still show considerable differences in the proportion of female employees. In addition, different types of gender-sensitive language can be taken into account. Apart from mentioning both the masculine and the feminine form, a number of graphemic variants are widespread in German, e.g. the use of so-called morpheme separators as in *Linguist*innen, Linguist:innen, Linguist_innen*, or the use of sentence-internal capitalization as in *LinguistInnen*. In addition, neutral forms such as *Lehrende* 'techers', lit. 'teaching (persons)' or *Pflegekraft* 'nurse' and, more rarely, purely graphemic devices such as *Lehrer** can be used, where the asterisk <*> is supposed to mark gender-neutrality.

We fit a binomial logistic regression model to the data, with gender as the response variable and the job sector (e.g. administration, health, IT/Engineering) as well as the type of gender-sensitive language as predictor variables. Our results indicate that compared to masculine generics (the baseline), all types of gender-sensitive language lead to a slight but significant increase in female views, but the effect is particularly strong when terms are used that include the female suffix *-in*. These results come with a number of caveats: For one thing, for reasons of privacy and anonymity, we only have access to aggregate data, which means that we cannot know how many *different* individuals have viewed the job listings in question, and are unable to add random effects for individual viewers, which would make our model more reliable. For another, we cannot exclude the possibility that employers advertising jobs that are stereotypically associated with female employees are more prone to use gender-sensitive language than employers advertising stereotypically "male" positions. Given the size of our dataset, however, we are confident that despite these potential confounds, our results do allow for some tentative conclusions regarding the behavioral effects of different types of gender-sensitive language and, indirectly, their underlying cognitive representations. In particular, our results support previous research indicating that masculine generics are strongly tied to male representations, and additionally suggest that female representations are strongly tied to explicitly feminine forms with the suffix *-in*.

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The Nature of Automatic Semantic Retrieval in Individuals with Mild Cognitive Impairment

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Alzheimer's disease (AD), a progressive and terminal dementia, is expected to impact an estimated 14 million Americans by 2050 (Alzheimer's Association, 2019). Before an AD diagnosis, many individuals are diagnosed with mild cognitive impairment (MCI) and have similar, but less severe, symptoms compared to those with AD (Carter et al., 2012). A common occurrence in even early AD is word finding deficits (Crowe et al., 1997), which significantly impacts effective communication. Semantic priming studies have shown that word finding deficits in AD may partly be due to limitations in the automaticity of semantic retrieval. However, it is unknown if the automaticity of semantic retrieval underlies word finding difficulties in individuals with MCI or if the deficit in semantic retrieval occurs later in the AD continuum.

Semantic priming tasks are considered the gold standard for assessing the organization of semantic memory. Participants see a written word (a prime) on a computer screen followed by another written word (a target). Upon seeing the target, participants make a lexical decision (Neely, 1991) by determining if the target is a real word or not. Importantly, the speed of the lexical decision is influenced by the semantic relationship between the prime-targets. Participants respond more rapidly to semantically related prime-targets (e.g., *cat – dog*) than they do to semantically unrelated prime-targets (e.g., *cup – pen*) because of spreading activation (Laisney et al., 2011; Neely, 1977). Spreading activation occurs when a word (e.g., *cat*) automatically activates other related words including members of the same category (e.g., *dog*), attributes of the target word (e.g., *whiskers* or *feet*), etc.

Spreading activation occurs unconsciously, therefore participants cannot be aware of the relationship between prime and target (McNamara, 2005). To achieve this, the amount of time between the presentation of the prime and target, known as the *stimulus onset asynchrony* (SOA), must be relatively short (400 milliseconds or less; Giffard et al., 2005; Neely, 1977).

Historically, most semantic priming tasks have been completed with healthy younger adults. These studies have shown that healthy younger adults exhibit priming for category coordinates (i.e., members of the same semantic category; e.g., *pig – horse*; Perea & Rosa, 2002). Semantic priming occurs for both distinctive attributes (e.g, *zebra – stripe*; Cree et al., 2006) and shared attributes (e.g., *lizard – tail*; Frenck-Mestre & Bueno, 1999), and also for abstract words (e.g., *comfort – peace*; Kousta et al., 2011). Though slower at responding overall, healthy older adults consistently exhibit comparable priming effects to healthy younger adults (Bennett & McEvoy, 1999; Ratcliff et al., 2004).

Individuals with mild to moderate AD typically show comparable semantic priming to healthy older adults for category coordinates (Laisney et al., 2011; Silveri et al., 1996) with a few exceptions. Individuals with AD show hypopriming (i.e., reduced priming compared to healthy older adults; Predovan et al., 2014) for distinctive attributes even at the early stages of the disease (Laisney et al., 2011). Individuals with AD show no difference for shared attribute priming compared to healthy older adults in the earlier stage of the disease (Laisney et al., 2011; Silveri et al., 1996), but hypopriming in later stages (Giffard et al., 2002). In an examination of emotional versus emotionally neutral concrete versus abstract words, Giffard and colleagues (2015) found hypopriming for neutral abstract concepts.

Examination of semantic priming in individuals with MCI for distinctive attributes (e.g., *zebra – stripe*), shared attributes (e.g., *pigeon – wing*), category coordinates (e.g., *cat – dog*), and abstract

words with neutral arousal levels (e.g., *motive* – *reason*) utilizing a short SOA has not occurred previously. The current study examined the semantic retrieval for healthy older adults and individuals with MCI in each of the 4 semantic relationship categories while utilizing an SOA of 250 milliseconds.

Prime-target word pairs belonged to one of three categories: (a) semantically related (e.g., *spider* – *web*); (b) semantically unrelated (e.g., *puddle* – *lesson*); or (c) nonword (e.g., *stove* – *loes*). Semantically related pairs (a total of 18 word pairs each) had one of four relationships: (a) distinctive attribute (e.g., *spider* – *web*); (b) shared attribute (e.g., *poplar* – *leaf*); (c) category coordinate (e.g., *trout* – *bass*); or (d) abstract (e.g., *policy* – *rule*). Semantically related targets did not differ on word length compared to semantically unrelated targets, $t(358) = 0$, $p = .50$. or on written word frequency, $t(97) = 0.86$, $p = .39$. Words were divided into six blocks of 120 word pairs each. Within each block, 50% of the words were real English words and 50% were nonwords to reduce possible postlexical attentional process effects (Laisney et al., 2011). The task was completed using SuperLab Remote (Cedrus Corporation, 2020).

The study was completed virtually due to the COVID-19 pandemic. Nineteen participants with MCI, with an ICD-10 diagnosis of MCI, and 19 demographic matched healthy older adult controls completed the study. The groups did not differ on age, $t(18) = 1.09$, $p = .29$, or education, $t(18) = 0.24$, $p = .81$. Participants with MCI had lower Montreal Cognitive Assessment (MoCA; Nasreddine et al., 2005) scores, $t(24) = 4.58$, $p < .001$ indicating a greater level of cognitive impairment.

Due to the known slower response times for individuals with MCI compared to healthy older adults (Brambati et al., 2012), raw response times were transformed to a priming percentage utilizing Laisney et al. (2011)'s transformation formula. Raw data showed priming for individuals with MCI on only shared attributes, $t(18) = 3.03$, $p = .004$ (one-tailed), $p = .007$ (two-tailed), $d = 0.69$; however, when data was transformed due to slowing, individuals with MCI demonstrated priming for shared attributes ($t(18) = 3.14$, $p = .003$ [one-tailed], $p = .006$ [two-tailed], $d = 0.72$), category coordinates ($t(18) = 1.86$, $p = .04$ [one-tailed], $p = .08$ [two- tailed], $d = 0.43$), and abstract words ($t(18) = 1.87$, $p = .04$ [one-tailed], $p = .08$ [two-tailed], $d =$

0.43) which was the identical pattern presented by healthy older adults. These findings suggest individuals with MCI exhibit functional automaticity of semantic retrieval within a wide range of word relationships. They also demonstrate the importance of transforming data for individuals with MCI even if their presenting cognitive symptoms are mild.

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The Dynamics of Open Texture

Jonathan Kendrick (University of Maryland)

Introduction. Many, if not all, predicates in natural language exhibit what Freidrich Waismann (1945) called "open texture" meaning that their extension is systematically undetermined. More precisely, given a predicate *F*, call *F open-textured* if there is some object *a* such that neither the facts about *F*'s usage, nor any non-linguistic facts, suffice to determine whether *a* falls into *F*'s extension.

Let's start with H.L.A. Hart's classic example of an open-textured predicate, *vehicle*:

> A legal rule forbids you to take a vehicle into the public park. Plainly this forbids an automobile, but what about bicycles, roller skates, toy automobiles? What about airplanes? Are these, as we say, to be called "vehicles" for the purpose of the rule or not? (1958, p. 607)

A necessary condition for being a vehicle is, presumably, being a thing designed to transport people or cargo, but you might think that that alone is not a sufficient condition for vehiclehood. For example, roller skates can transport people, but only under the skater's own impetus. Does that still count? Such dilemmas crop up across predicates: is a hot dog a sandwich? is Pluto a planet? and so on (McConnell-Ginet, 2006; Ludlow, 2014).

Many critics of truth-conditional semantics present open texture as a serious objection, potentially undermining the viability of the entire enterprise. Chomsky, for example, takes open texture as one of several reasons to think that utterances have at most "truth indications." This view has been subsequently defended by Chomskyans like Paul Pietroski who argues that "linguistic meanings *guide and constrain without determining* truth, reference, and other (norm governed) expression–speaker–world relations" (2005, p. 281). This paper defends a broadly Pietroski-inspired theory based on dynamic semantic approaches to vagueness (Kamp, 1981; Barker, 2002). In the process, we hope to show that open-texture can be accomodated using fairly standard tools from formal semantics.

A dynamic proposal. We adopt a view of context originating in Stalnaker (1978) according to which the common ground determines a context set of worlds $\sigma \subseteq W$. In Stalnaker's theory, the characteristic effect of assertion is to eliminate worlds in the context set; hence, a successful assertion of p updates the prior context σ with p returning a new context $\sigma[p] = \sigma \cap p$.

Descriptive vs. metalinguistic uses. Barker (2002) observed that gradable adjectives (GAs) can be used in two different ways:

(1) A: Is Feynman tall or short?
B: Feynman is tall.

(2) A: Who around here is considered tall?
B: Well, around here Feynman is tall.

On their descriptive use, B's assertion of the GA in (1) adds to the common ground information about Feynman's height. However, on their metalinguistic use, B's assertion of the GA in (2) does not add new information to the common ground; rather, B's utterance serves to inform A about the prevailing standard of tallness in the community. This use is harder to model in the Stalnakerian framework we've sketched. Moreover, we the same constrast with non-vague open-textured predicates:

(3) A: What is a smörgastrata?
B: A smörgastrata is a sandwich.

(4) A: What around here is considered a sandwich?
B: Well, around here a smörgastrata is a sandwich.

Whereas (3) adds information to the common ground about what kind of thing a smörgastrata is, (4) adds information about how the predicate sandwich is used.

Adding conventions. To capture metalinguistic uses of open-texture predicates, we follow Kocurek and Rudolph (2020) in introducing a function **c** called a *convention* which assigns intensions to names and predicates. Given a set of worlds *W* and a domain *D*, a convention **c** is a function such that:

- $\mathbf{c}(a) : W \to D$ for each name a
- $\mathbf{c}(P^n) : W \to \mathcal{P}(D^n)$ for each n-place predicate P^n

We treat the meanings of expressions as context change potentials on a context modelled as a set of world-convention pairs:

(5) $[\![\text{a scooter is a vehicle}]\!] = \lambda\sigma.\{\langle w, \mathbf{c}\rangle \in \sigma : w \text{ s.t. } \mathbf{c}(\mathbf{scooter})(w) \in \mathbf{c}([\![\text{vehicle}]\!])(w)\}$

The descripive use corresponds to a situation in which there's agreeement about the relevant convention, but there's uncertainty about what the world is like.

w	$\mathbf{c}([\![\text{vehicle}]\!])(w)$	$\mathbf{c}(\mathbf{scooter})(w) \in \mathbf{c}([\![\text{vehicle}]\!])(w)$?
w_1	$\{car, motorcycle, scooter\}$	✓
w_2	$\{car, bus\}$	✗

The metalinguist use corresponds to a situation in which there's agreeement about what the world is like, but there's uncertainty about the relevant convention.

$\mathbf{c}$	$\mathbf{c}([\![\text{vehicle}]\!])(w)$	$\mathbf{c}(\mathbf{scooter})(w) \in \mathbf{c}([\![\text{vehicle}]\!])(w)$?
$\mathbf{c}_1$	$\{car, motorcycle, scooter\}$	✓
$\mathbf{c}_2$	$\{car, bus\}$	✗

A prototype-based semantics for comparatives. We can give comparatives a test-based semantics similar to how modals are analyzed in update semantics (Veltman, 1996).

(6) A car is more of a vehicle than a scooter.

The basic idea is that constructions like (6) are claims about conceptual centrality. We assume there's a distance metric *d* : *D* → R over *D* and a prototype convention *p* which maps every predicate to its exemplar (Rosch, 1975; Osherson & Smith, 1981).

(7) a. $[\![\text{more}]\!] = \lambda\alpha\lambda x\lambda y\lambda\sigma.\{\sigma : \forall\langle w, \mathbf{c}\rangle\,.\, d(\mathbf{c}(x)(w), p(\alpha)(w)) < d(\mathbf{c}(y)(w), p(\alpha)(w))\}$

b. $[\![(6)]\!] = \lambda\sigma.\{\sigma : \forall\langle w, \mathbf{c}\rangle\,.\, d(\mathbf{c}(\mathbf{car})(w), p([\![\text{vehicle}]\!])(w)) < d(\mathbf{c}(\mathbf{scooter})(w), p([\![\text{vehicle}]\!])(w))\}$

In other words, a comparison of two individuals with respect to a predicate is a comparison of the distance between each individual and the exemplar of said predicate.

In addition, this also allows us to make sense of metalinguistic comparisons (Morzycki, 2011; Kocurek & Rudolph, 2020).

(8) Pluto is more of a dwarf planet than a planet.

(9) $[\![(8)]\!] = \lambda\sigma.\{\sigma : \forall\langle w, \mathbf{c}\rangle \,.\, d(\mathbf{c}(\mathbf{Pluto})(w), p([\![\text{dwarf planet}]\!])(w)) < d(\mathbf{c}(\mathbf{Pluto})(w), p([\![\text{planet}]\!])(w))\}$

A comparison between two predicates with respect to an individual is a comparison of the distance between each predicate's exemplar and the relevant individual.

Further applications. In the full paper, we show that our dynamic theory has other advantages, explaining certain metalinguistic uses of conditionals (e.g., "if anything is a sandwich, a Reuben is a sandwich") (Hinterwimmer, 2010), counterconventionals (e.g., "if Pluto was a planet, there would be dozens of plantes") (Einheuser, 2006; Kocurek et al., 2020), and restrictions on attitude verbs like *consider* and *counts* (Kennedy & Willer, 2022).

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Social Meaning of Negative Concord in American English

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Negative concord (NC) refers to the phenomenon that the co-occurrence of multiple negations has the semantic meaning of one negation (*I didn't see nobody*). NC constructions in contemporary English are often taken as ungrammatical [2, 5], however, they appear in many non-standard varieties of English [8]. Sociolinguistic studies on the usage of NC found different patterns: while NC use is socially stratified in populations in Detroit and African American Vernacular English speaking adults and pre-adolescents, its use was shown to reflect in- and out-group dynamics in adolescents [4, 9, 3]. That is, NC does not only or always reflect **social categories** as in first and second wave sociolinguistics, but it can be used to establish a certain **persona** during a conversation, resulting in social meaning [1]. We are interested in the perceived social meaning of NC vs. its standard variant of negative polarity items (NPIs: *I didn't see anybody*), using a set of social meaning measures including those relating to 1) social background of the speaker: socioeconomic status and education; as well as 2) persona: politeness, formality, rebelliousness, coolness, friendliness, confidence, and warmth. Our hypotheses were the following: NC is associated with 1) lower (**H1**) socioeconomic status, (**H2**) education, (**H3**) formality, and 2) higher (**H4**) rebelliousness, (**H5**) coolness, (**H6**) friendliness, (**H7**) confidence, and (**H8**) warmth, but lower (**H9**) politeness in comparison to NPIs.

Design. Experiment 1 in American English (N=48, data collection ongoing) used a 1-factorial design with the factor NEGATION (NC vs. NPI). The 12 items and 29 fillers consisted of a consistent introduction sentence (S1) and the critical sentence (S2) (see (1)). Participants then rated nine qualities of the speaker on a 7-point Likert scale with labeled midpoint (undecided) and endpoints (high/low socioeconomic status, high/low education, in/formal, im/polite, obedient/rebellious, un/cool, cold/warm, un/friendly, un/confident).

(1) (S1) Somebody says:
(S2) "I didn't have {no/any issues} so far."

Results. We computed separate ordinal models for the ratings of Q1-Q9 (see Figure 1); p- values were obtained using log-likelihood ratio tests. The preliminary results confirmed **H1** to **H4** and **H9**: socioeconomic status ($\hat{\beta}$=3.55, LR(1)=51.95, p<0.001), education ($\hat{\beta}$=6.31, LR(1)=43.16, p<0.001), formality ($\hat{\beta}$=4.92, LR(1)=49.25, p<0.001), coolness ($\hat{\beta}$=0.58, LR(1)=22.44, p<0.001), friendliness ($\hat{\beta}$=0.65, LR(1)=30.71, p<0.001), confidence ($\hat{\beta}$=0.65, LR(1)=26.78, p<0.001), warmth ($\hat{\beta}$=0.57, LR(1)=24.42, p<0.001), and politeness ($\hat{\beta}$=1.25, LR(1)=99.17, p<0.001) are rated significantly lower for NC than for NPI. Rebelliousness is rated as significantly higher for NC than for NPI ($\hat{\beta}$=-1.73, LR(1)=17.98, p<0.001).

Conclusion. The preliminary results showed that NC has a distinct social meaning differing from that of NPI constructions. Extending Experiment 1, we will conduct Experiment 2 manipulating a second factor of context (formal vs. informal) to tackle the social meaning of the NC vs. NPI alternation in different situational-functional settings [6, 7]. The results of both experiments will be presented at the workshop.

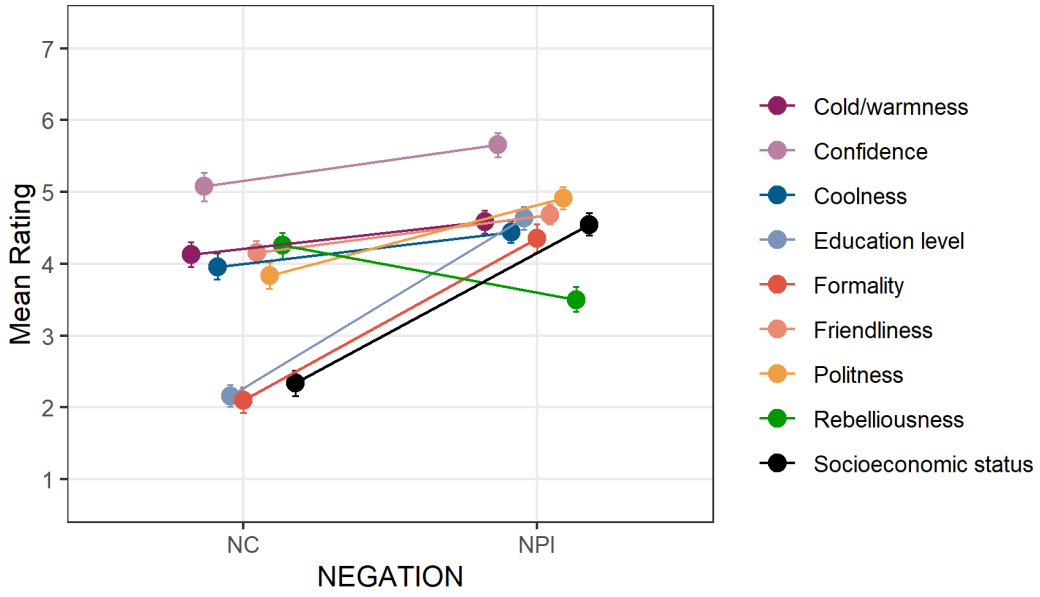

Figure 1: Mean and error bars of the ratings. The x-axis depicts the factor NEGATION with its levels negative concord (NC, left) and negative polarity items (NPI, right). The colors indicate the question.

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Accessing Concepts from (Pseudo)constituents of Words

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Introduction

How are compound and pseudocompound words interpreted during visual word recognition? While it is clear that a compound word such as *bedroom* refers to a particular object, it also makes reference to two other objects related to its constituents—namely, *bed* and *room*. Some object names, however, superficially embed word-like graphemic sequences that do not correspond to true morphemes. For instance, a pseudocompound such as *fanfare* can be erroneously parsed as containing *fan* and *fare*. In fact, research seems to overwhelmingly support the view that there is some form of morphological parsing, whereby the visual word recognition system parses letter strings into morphemes and subsequently accesses their concepts [1]. It remains unclear, however, (1) the kind of knowledge available to the morphological parser during recognition, (2) the locus of semantic effects in morphological processing, and (3) whether the concepts of both constituents and full words are simultaneously accessed.

The present study aimed to investigate whether the "constituent concepts" of compound and pseudocompound words are tokened. The comparison between compounds and pseudocompounds is a crucial test case in understanding the nature of the visual word recognition system and how concepts are accessed by their linguistic labels.

We employed a picture-word congruency paradigm, whereby words and pictures were presented dichoptically, in opposing visual fields. Participants were instructed to judge the relatedness between word-picture pairs. The key manipulation involved presenting either compounds or pseudocompounds as target words and pictures depicting one of their "constituents" (e.g., *bedroom-BED* and *fanfare-FAN*, respectively). Additionally, we manipulated the position of the "constituent" probed by the picture (first and second "constituents"; see Figure 1a). These manipulations are motivated by the assumption that words and objects access the same amodal representations in the conceptual system [2, 3]. Thus, if compound and pseudocompound words are parsed and their "constituent concepts" are accessed, both word types are expected to yield relatedness judgements. However, if the morphological parser operates with knowledge of the semantic relation between constituent and full word, then only compounds are expected to yield relatedness judgements.

Method

Sixty-two participants performed a word-picture congruency task, which consisted of concomitantly presenting word and picture targets for 133 msec, followed by a backward mask for 200 msec. Target words were 24 compounds and 24 pseudocompounds. The set of target pictures probing the first (modifier) and second (head) "constituents" of compounds and pseudocompounds were evenly distributed. Additionally, we manipulated the complexity of the target word, which was either the full word or the probed "constituent" with hashmarks blocking the unprobed constituent (e.g., *bed####-BED*). We also controlled for the hemispheric projection of the target word, whereby words were presented either in the left or right visual fields (right or left hemispheres, respectively), with pictures presented in the opposing visual field.

Results and Discussion

Analyses of accuracy and response times were conducted using linear mixed-effects models. Correct responses to pseudocompounds were "yes" relatedness judgements considering that

responding “yes” reflects the degree to which pseudo-constituent concepts are tokened. The conceptual access to compound constituents was facilitated as compared to pseudocompound “constituents”—with greater accuracy and shorter response times. In addition, compounds and pseudocompounds produced a first “constituent” advantage for accuracy but not for response times. That is, probing the first (modifier) “constituent” elicited more accurate responses than probing the second (head) for both compounds and pseudocompounds (see Figure 1b).

Taken together, our findings partially support the view that the morphological parser is blind to semantics. Parsing is considered morpho-orthographic, whereby all potential constituent morphemes are identified from graphemic sequences. The inconsistent “modifier” advantage can be explained by either a parser that operates from left-to-right or by positing the composition of “constituent concepts” following a modifier-head structure. Specifically, probing the “head constituent” (e.g., *seatbelt-BELT*) can yield an incongruency between the word’s compositional meaning (a type of *belt* that is modified by *seat*) and the picture referent (a generalized type of *belt*).

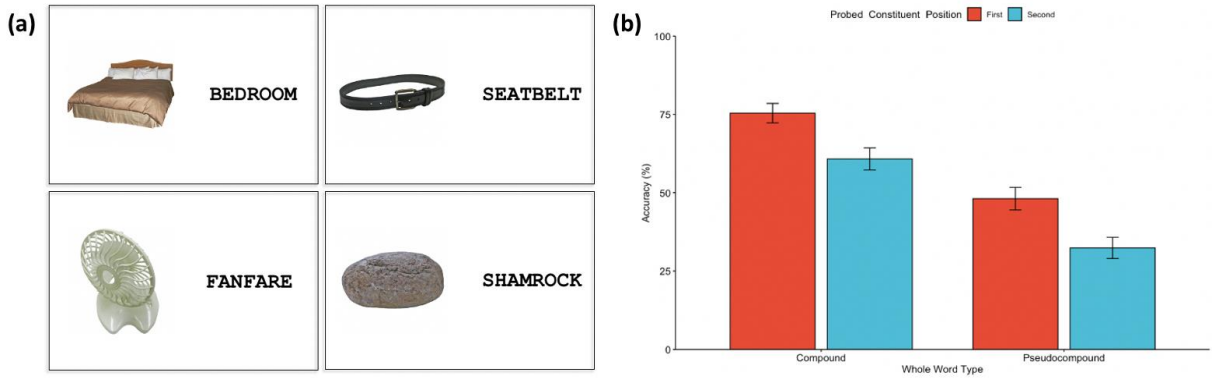

Fig. 1. (a) Illustration of experimental trials with compound (top row) and pseudocompound (bottom row) target words, as well as pictures probing the target words’ first or second “constituents”. (b) Mean accuracy in relatedness judgments to compounds and pseudocompounds as a function of the probed constituent position.

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From Concept to Syntax in Production: Evidence from Coercion and Metonymy

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When a speaker decides to express what they want to say, there are several stages that the speaker must go through (e.g., Levelt, 1989). Coercion or Metonymy would be good examples: a speaker must choose between a non-coerced (1-a) or non-metonymic form (2-a), and a coerced (1-b) or metonymic form (2-b) that can express the same meaning.

(1) a. The singer began drinking the champagne.
    b. The singer began the champagne.
(2) a. The student bought Steven King's book.
    b. The student bought Steven King.

How does the speaker choose between these options? This study investigates how the speaker chooses such alternatives and uses this information to determine how conceptual information is converted into grammatical structures during sentence production.

The literature on sentence production has investigated how the speaker repeats the same syntactic structure (called structural priming, Bock 1986; Pickering & Branigan 1998), and how this phenomenon is influenced by the repetition of the same words or syntactic forms (Levelt et al., 1999). These studies have shown the mechanisms by which the speaker uses lexical and syntactic information when they formulate grammatical structure. However, there are many other aspects of the process that the speaker must go through. For instance, when the speaker expresses the message, sometimes one entity means the entity as a whole (as in (1-a) and (2-b)) or more than the meaning of the entity (as in (1-b) and (2-b). How does the speaker produce the missing structures instead of the full-form structures?

When the speaker expresses the missing structure, these can be interpreted as either *The student began the champagne* or *The student began drinking the champagne*, *Steven King* or *Steven King's book*. Thus, a semantic representation is assumed to have both coerced or metonymic, and non-coerced or non-metonymic. Similarly, syntactic representation also has two representations: predicate or object only, or noun only, or noun's noun. Thus, the same semantic structure can have two different representations.

How are these semantic and syntactic representations mapped during production? Research on semantic- to-syntactic mapping in language production suggests that this procedure influences the conceptual (semantic) representation of an underlying message. In the past, many studies have indicated that conceptual factors such as animacy (McDonald et al., 1993; Tanaka et al., 2011), concreteness (Bock and Warren 1985), prototypicality (Kelly, Bock and Keil 1986), salience (Prat-Sala and Branigan, 2000) influence the production of syntactic structure, such as grammatical function assignment (e.g., voice) or word order (e.g., canonical or non-canonical order).

However, these studies mainly focused on how conceptual factors influence surface syntactic structures in production, and there has been little attempt to determine how complicated structures are produced. In this sense, using coercion and metonymy will reveal how conceptual and syntactic representation are mapped in production. This is because, when the speaker produces a coerced or metonymic expression, the speaker needs to access semantic information which is not entirely related to syntactic information, but this process is still lexically determined since the meaning of these sentences depends on each.

Research on language production has proven that the speaker is likely to repeat certain

aspects of syntactic structures (structural priming, Bock, 1986). Many studies also found that the conceptual or semantic level of representations can be primed (e.g., Garrod & Anderson 1987). In this sense, it is likely that the elements at conceptual structures are still abstract and not realized in syntactic structure, and these influence the choice of syntactic structure in sentence production, therefore, structural priming at the conceptual level suggests the nature of semantic and syntactic structures in language production.

Thus, using priming would be an extremely useful tool to investigate how we produce the missing structures such as coercion or metonymy. If we compare the production involving a coerced or metonymic form, and a non-coerced or non-metonymic form, we will be able to find the exact details of mapping from the semantic to the syntactic structure. Thus, the current study reviews one study by Raffray et al. (2014) using coercion and compares their study with a more recent one by Tanaka (2023) who used metonymy.

Firstly, Raffray et al. (2014) ran a series of picture description experiments and demonstrated that the speaker was more likely to describe a target picture with coerced expressions after describing the prime picture with coerced expressions (e.g., *The singer began the champagne*) than with non-coerced expressions (e.g., *The singer began drinking the champagne*). Secondly, Tanaka (2023), on the other hand, used a sentence recall task in Japanese and showed that the speaker was more likely to recall sentences with metonymic expressions correctly after recalling metonymic expressions (e.g., *The student bought Steven King*) than after recalling non-metonymic (e.g., *The student bought Steven King's book*) or literal expressions (e.g., *The student met Steven King*). Both Raffray et al. and Tanaka also showed that the syntactic structure (a verb phrase containing a verb and a noun, or omitting the verb in coercion, noun only vs. noun's noun in metonymy) was primed when the coerced and metonymic structure was controlled. These results suggest that there are distinct mappings from semantic to syntactic structures when the speaker produces such sentences.

Therefore, the results of these studies indicate that the elements of conceptual structures are still abstract and not realized in syntactic structure, and these influence the choice of syntactic structure in sentence production. To conclude, this study indicates that there are distinct mappings from semantic to syntactic representation in production and discusses how such results are interpreted in terms of the model of language production.

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Conceptual Integration in Creative Sentences: Evidence from Eye-Tracking

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Creativity typically involves the combination of concepts in a way that is novel but appropriate (Runco & Jaeger, 2012). Applied to language, speakers can form creative expressions by assigning familiar words a novel meaning, as in the case of creative metaphor, or by using them in a grammatical structure in which they usually do not occur (Munat, 2015). One example of the latter is the phenomenon of "valency coercion", where a verb occurs with arguments that do not form part of its prototypical syntactic frame (Audring & Booij, 2016; Goldberg, 1995; Lauwers & Willems, 2011). For example, in example (1), the verb *sneeze*, which is prototypically intransitive, is "coerced" into a structure with a direct object and a locative adverbial, thus acquiring a caused- motion meaning.

(1) *Sally sneezed the napkin off the table.* (Goldberg 1995: 6)

Previous research has largely focused on what factors determine the acceptability of coerced sentences (Busso et al., 2020; Perek & Hilpert, 2014). In contrast, the question of *how* speakers process instances of valency coercion has not been addressed experimentally. In this talk, we report an eye-tracking study that sheds light on how speakers integrate concepts during the real-time processing of creative language.

In the experiment, self-reported native speakers of English read 24 naturalistic text passages, such as (2). To ensure that they paid attention to the content, 25% of trials were followed by a comprehension question. The critical part of each passage (see the highlighted section) consisted of a caused-motion sentence that contained either (i) a prototypical caused-motion verb (*pushed*); (ii) a coerced verb (*sneezed*); or (iii) an anomalous control verb (*arrived*). To assess processing, we measured participants' eye movements at the three regions after the verb: the noun phrase (NP), the prepositional phrase (PP), and the following two words as a spillover region.

(2) *Frank swallowed a red chili pepper at the dinner table. Tears streamed from his eyes, and he reached blindly for his napkin. Unable to control himself,* ***Frank pushed/sneezed/arrived his napkin off the table*** *and knocked over a few of the wine glasses.*

We predicted that, in the coerced condition, participants would encounter a combinatorial conflict at the NP (*his napkin*), thus leading to longer reading times or regressive eye movements back to the verb. At the subsequent PP (*off the table*) and/or the spillover region (*and knocked*), however, speakers should be able to reintegrate the sentence contents, thus leading to a speed-up in reading time in coerced sentences compared to anomalous ones.

Our preliminary results (N = 12) tentatively support these predictions, even though we cannot conduct a full statistical analysis yet. As far as first-pass times are concerned (i.e., the time participants fixate on a region when they first read it), no clear differences are apparent between conditions (see Figure 1a). In contrast, re-reading times (i.e., the time participants spend re-reading earlier sentence regions once they reach a given point) show clear numerical differences between conditions (see Figure 1b). At the NP, participants spent considerably longer looking back to earlier sentence regions in coerced and anomalous sentences than in prototypical sentences. For coerced

sentences, this effect appears to decrease at the PP and disappear at the spillover region. For anomalous sentences, meanwhile, re-reading times are still high at the PP and even seem to persist at the spillover.

Together, the regressive eye movements suggest that speakers try to arrive at a meaningful interpretation of both coerced and anomalous structures. In coerced sentences, the repair attempts are successful, thus allowing speakers to gradually re-integrate the verb with its unusual arguments. In anomalous sentences, meanwhile, repair attempts are less successful, thus resulting in persistent processing difficulty. These results are the first to illustrate how instances of valency coercion are processed in real time. They suggest that speakers are able to understand creative sentences through a gradual reintegration of seemingly incompatible concepts.

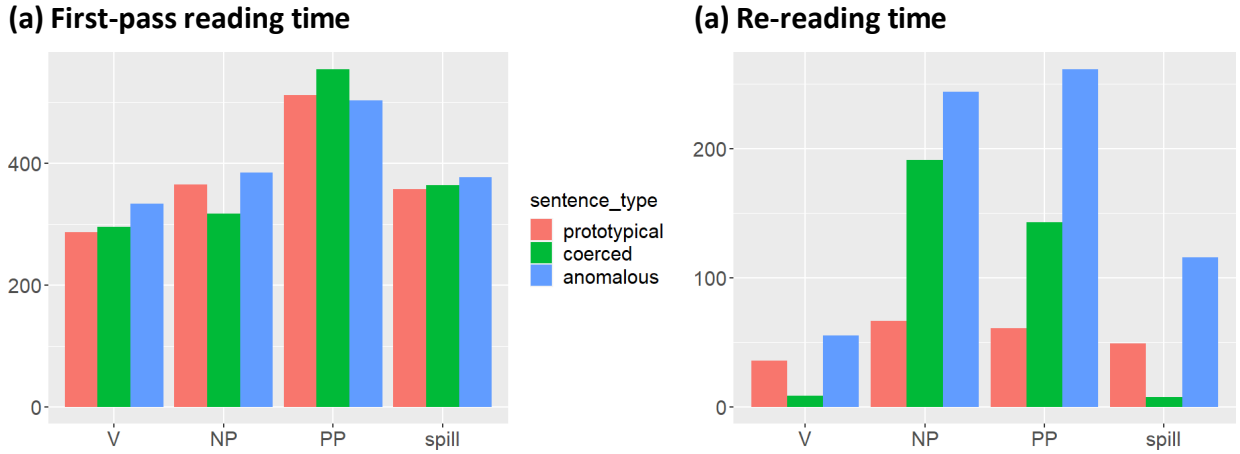

Figure 1. First-pass and re-reading time (in ms) at four sentence regions in prototypical, coerced, and anomalous sentences

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From Perception to Meaning: The Role of Color and Texture in the Early Stages of Conceptual Access

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What role do color and texture play in the early stages of conceptual access? Building on Antal and de Almeida's (2023) research, we further investigated the effects of these early visual properties on conceptual processing. In the previous study, two main questions were explored: (1) what *kind* of information is accessed when a referent object is perceived? Are referent objects accessed via the whole object (i.e., at the superordinate-level or at the basic level), or are referent objects accessed via their constituent features (i.e., their high- or low-salient features), and (2) what is the time-course of conceptual access? Their findings suggest that upon seeing a referent such as a dog, participants access superordinate (e.g., ANIMAL) and basic-level information (e.g., DOG) before processing semantic features (*fur*, *barks*; Antal & de Almeida, 2023). However, the use of simple line drawings in their study could have hindered the perception of salient features. It is well known that color has a high 'diagnosticity' (i.e., an object that has a strong association with a color—such as red for apple) acting as a salient cue facilitating conceptual access. Color may not only assist in the process of accessing a concept but may also give primary access to basic-level concepts (e.g., the orange of a carrot aids its recognition as a carrot; Bramão et al., 2011; Rossion & Pourtois, 2004).

The present study explored the same main questions as Antal and de Almeida's (2023) study but with the introduction of color and texture in the object stimuli, aiming to investigate the role these features might play in conceptual access. We also assessed whether employing an 'ultra-rapid' stimulus presentation (i.e., 30 ms) would yield a superordinate effect, a finding observed in prior studies (VanRullen & Thorpe, 2001; Macé et al., 2009). We employed a masked picture-word congruency task, with a dichoptic presentation of pictures (e.g., dog) and words representing different object properties (e.g., dog, animal, bark, fur). Stimuli were presented for 30, 50, 190, and 390 milliseconds. Upon the picture-word presentation, participants decided whether the picture and word were related.

Our results revealed that introducing color and texture actually hindered participant accuracy. Contrary to studies suggesting that color facilitates conceptual access at the basic-level (Rossion & Pourtois, 2004), our findings showed no such difference in comparison to simple line-drawings. Given the improved performance with less detailed objects (i.e., the simple line drawings), it appears that the object's shape, rather than its color, might be what's crucial in facilitating the process of conceptual access (Elder, 2018). However, further studies focusing solely on object contours would be required to confirm this possibility. Furthermore, and in line with the previous study, our data suggests that we initially access whole-object information at the basic-level (e.g., DOG) and superordinate-level (e.g., ANIMAL), with features analyzed later in conceptual processing. These results are predicted by theories that propose non-decompositional early access to concepts (Fodor, 1998; Fodor & Pylyshyn, 2015), rather than feature-based access (Rosch, 1978; Moss et al., 2007). Our findings provide insights into the nature of conceptual information and the time course of conceptual access.

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Pre-Lexical Morphological Parsing of Ambiguous Roots: Evidence from a Cross-Modal Task

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Words like "bark" have two associated meanings (i.e., the noise that dogs make and the outer layer of a tree). At the earliest moments of lexical processing, regardless of contextual constraints, semantically ambiguous words have often been shown to prime associates of both of their meanings (Swinney, 1979; Onifer & Swinney, 1981; but see Tabossi, 1988, and Swinney, 1991). However, if the word is suffixed (e.g., *barking*), it is no longer ambiguous. In this case, it is unclear whether all meanings of the ambiguous root (i.e., *bark*) are still accessed. If all senses are accessed early in processing, this would provide evidence for the existence of a pre-lexical morphological parser; a mechanism that breaks down words into their constituent morphemes before recognition (see Libben & de Almeida, 2002). On the other hand, if only the contextually appropriate meaning of the root is accessed, this would indicate that the suffixed word was not parsed into its constituent morphemes before interpretation.

Thus far, only two studies investigated the phenomenon of semantically ambiguous roots with disambiguating suffixes, one employing masked priming with words in isolation (Libben & de Almeida, 2002) and another employing eye-tracking and a maze paradigm (de Almeida, Gallant, & Libben, in prep.). Both studies showed evidence of meaning activation for ambiguous roots, despite the disambiguation provided by suffixation. However, it is not clear whether the activation of root meanings is governed by a purely visual procedure, which is taken to separate roots from affixes based on morpho-orthographic regularities. In the present study we investigated whether this phenomenon could also be obtained during speech comprehension. In a cross-modal lexical decision task (Swinney, 1979), we measured the activation of different meanings of the root (e.g., *bark*) over two timepoints. Participants listened to sentences containing a suffixed root (e.g., *He heard loud barking during the night…*) and were required to make word/non-word lexical decisions to masked visual targets presented for 80 msec at the word's recognition point or 500 msec later. The recognition point was determined by norming study employing the gating paradigm (Grosjean, 1996). The visual targets were either the semantic associates of the two meanings of the ambiguous root (*dog*, *tree*) or unrelated (e.g., *term*). We predicted that both meanings of *bark* would be activated at the recognition point but only the biased meaning (*dog*) would remain active at the later point, if *barking* is parsed during recognition.

Response times from 82 participants were entered into a linear mixed effect model with priming, timepoint and target types as fixed effects, participant and target item as random effects and logged target word frequency scores as a covariate. Results showed a significant main effect of priming ($\chi 2\ (1) = 5.47$, $p = 0.019$; see Figure 1) with no other significant main effects or interactions. Planned comparisons revealed that priming was only significant for root-related targets at the early timepoint. This effect is consistent with previous studies investigating the same phenomenon but with visual stimuli, which may facilitate the parsing of highly frequent morpho-orthographic patterns such as '*-ing*'. These data further suggest that pre-lexical morphological parsing is obtained during comprehension, regardless of modality, thus highlighting the role of morphological knowledge in the early moments of language processing. Overall, the present study provides support for a pre-lexical morphological parser, yielding exhaustive conceptual access when encountering a semantically ambiguous morpheme, even within an unambiguous suffixed root.

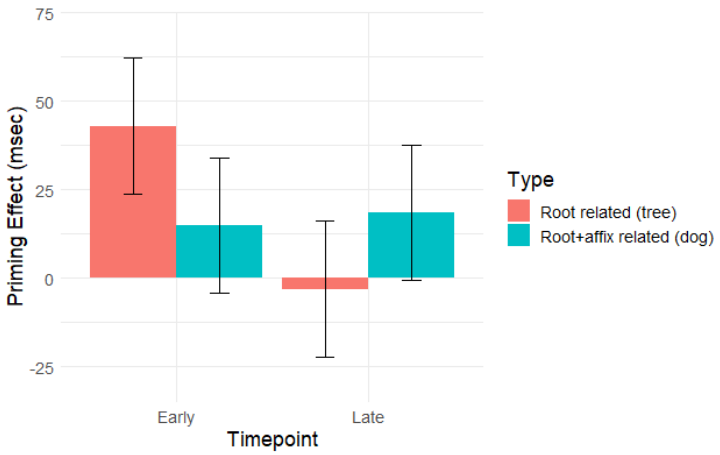

Figure 1: Ambiguous root priming ($RT_{CONTROL}$ - $RT_{EXPERIMENTAL}$).

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Do Concepts Decompose? Evidence from a Memory-for-Propositions Task

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Theories of verb-semantic representation have long maintained that lexical causative verbs such as *kill, boil,* or *drain* are represented by complex semantic templates encoding at least two predicates (e.g., Jackendoff, 1990; Levin & Rappaport-Hovav, 2005), one denoting the agent's causative act, and another, the change of state in the affected object. Although theories vary with regards to how these semantic components are characterized, what is common is the idea that a single, morphologically simplex verb might encode semantically at least two predicates (e.g., *kill* is represented as [[*X* ACT] CAUSE [*Y* BECOME<*DEAD*>]]).

We investigated the causative complexity hypothesis by employing a memory-for-propositions task (Kintsch, 1974, Ch. 7), which was shown to be sensitive to semantic rather than sentence-surface complexity. In his studies, Kintsch maintained that propositions— operationalized as truth-bearing units of information— could be singled out from surface structure, according to recall performance: independent of sentence length, a sentence of greater propositional complexity was harder to free recall. Thus, *the travelers noticed a restaurant* and *the excited audience applauded* would have a similar surface structure of three content words but a different propositional complexity, with the former conveying one proposition (NOTICE[TRAVELERS, RESTAURANT]) and the latter conveying two (APPLAUD[AUDIENCE] & EXCITED[AUDIENCE]).

The present study applied Kintsch's operationalization of propositions to verbs, with the assumption that if lexical causatives decompose, they should convey a greater propositional complexity and be harder to recall than simple transitives. Holding surface structure constant, we found that sentences with lexical causatives (*The maid drained the tub*) were recalled no differently from simple transitives (*The maid examined the tub*), but recall performance was greater for them when compared to sentences with morphological causatives (*The maid sanitized the tub*), which encode causation explicitly in their morphology. This contrast could not be attributed to morphological and sentence surface alone, as we also found no difference in recall between morphologically simplex verbs (*examined*) and complex ones (*re-examined*). However, the difference between simple transitives and morphological causatives supports the effectiveness of Kintsch's design in isolating propositional complexity. Additionally, we found that sentences with lexical causatives were recalled better than periphrastic causatives (*The maid caused the tub to drain*), verbs that express an explicit causative form and supposedly represent the same semantic template as their lexical counterpart. Results suggest that the semantic complexity of verbs is a function of their surface morphological complexities, without predicate decomposition. The lack of decomposition effects points to an atomistic view of conceptual representation (e.g., Fodor, 1998).

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