Compounds and Aphasia: An Overview of Recent Researches in Theoretical and Experimental Neurolinguistics

As the complex system of compounds is at present poorly understood, one of primary research emphasis include how complex words are represented and accessed in the mental lexicon. Latest research studies are concerned with how production errors could exhibit mental representation of complex words. Evidence is looked for in the error patterns in typical population comparing to patients with acquired and developmental language impairments, namely aphasic and neurodegenerative conditions.

Three dominant models include (i) full listing, (ii) decomposition or full parsing, and (iii) dual route. Full listing account supports the approach that complex words are stored as whole words and accessed as such. Even though it promotes storage economy, such a view would not make a difference between simple and complex words. The strongest evidence for the difference between compound storage and simple word storage is the compound effect (Semenza & Mondini, 2010; a. o.). Moreover, structural and rule knowledge is evident in error patterns and independent of phonological form. Mondini et al. (2003) tested aphasic comparing to typical population on naming simple nouns and verbs followed by compound nouns in the picture naming tasks. They confirmed earlier prediction in differentiating simple lexical items from compounds, showing close to perfect results in naming simple words, and grouping error patterns in compound production. Errors types such as substitution and omission of compound constituents support compositional approach in word retrieval. Headedness effect is taken as the main predictor to determine mental representation of compounds (Mareli et al., 2013; Lorenz et al., 2014), followed by various factors in processing, such as semantic transparency and frequency effect. Results speak in favor of dual route account, which considers activating both holistic and decompositional methods, depending on semantic transparency and lexical frequency of the head constituent.

In addition to omissions and substitutions, errors such as misordering, paraphasia, neologisms and circumlocutions gave strong evidence for the mental representation of compounds that supports two stage lexical access of Levelt et al. (1999): (i) semantic–conceptual level, followed by lemma level, where grammatical properties of morphologically complex word are accessed, and (ii) phonological level. Constituent errors included their omission or substitution or phonological distortion in compound picture naming and naming to definition tasks. Furthermore, neologisms and circumlocutions of one of constituents indicated that the origin of errors leads to the existence of semantic level. Failure to retrieve the exact phonological form speaks in favor of existence of phonological level of representation. Lexical processor identifies at some point the morphological structure of compounds. In support to this claim, subjects didn't produce substitution errors when targets were single words (Mondini et al., 2003; Lorenz et al., 2014; Marelli et al., 2014; a. o.). Lorenz et al. (2014) support dual route approach and suggest both full form and decompositional representation at the lexical level, which will depend on various factors. Unlike grammatical class (defined at lemma level), semantic transparency and opacity categories are held to be differently represented and processed, as indicated by the transparency effect with constituent errors. More constituent errors in transparent compounds than opaque ones could suggest that compositional access of transparent ones would include activation of all neighboring concepts (parallel activation of semantically related concepts at the conceptual level), while opaque access

include full form access. On the other side, more semantic errors were present with less semantic transparency. Such results fit nicely within the account by Libben (1998), assuming the connection between full form and constituent elements at semantic level only in case of transparent compounds, but not the opaque ones.

Research in compound processing in agrammatism in stroke induced and primary progressive aphasia (PPA) population (Kordouli et al., 2018) shed light on compound processing in aphasic conditions also in relation to neurodegenerative disorders. Specifically, it investigates for presence of grammatical, morphological, and semantic knowledge in stroke–induced agrammatism and agrammatism induced by PPA, with cross-linguistic evidence from Greek as a language with reach morphology. Morphological impairments related to inflection and derivation in aphasic agrammatism, both stroke induced and PPA, are reflected mainly in verbal inflection in production. Ability to detect morphological violations in comprehension of derived nominal, verbal, and adjectival forms is severely impacted in PPA, but relatively preserved in stroke induced agrammatism. The results complement nicely developed models of compound mental representation and processing, where total decomposition and dual route approaches in word retrieval are supported by the errors concerning compound constituents and not only whole compounds. Omission, substitution, and misordering constituents support the presence of structural knowledge. Moreover, these patterns strongly speak in favor of compositional approach.

Looking at other types of complex words, such as derivation by prefixation and suffixation in word formation, decompositional mechanism in case of prefixed words and holistic approach in case of suffixed forms have already been enclosed and described. Newest studies considering derived words are yet to be explored in lexical retrieval. Further research will show whether dual route approach is preferred model for derivational words, just as in compounds.

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