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## Ethnography of external representations reconsidered

The aim of the presentation is to reflect upon the notion of external representation (ExR) used by David Kirsh in "Thinking with External representations" (2010). Kirsh aptly stresses that the material dimension of representation plays crucial role in cognition, especially as it comes to sharing the same content, rearranging ideas, re-describing problems to be solved, and constructing abstract structures. One of the possible way to analyse the notion of external representation used by Kirsh is to focus on epistemological and ontological features of external representations. For example, we can reasonably ask the question whether the idea of external representation is consistent in itself, since ExR always had to be interpreted and as such, it will consist of some internal components (Wachowski 2014). The account presented in my paper is more parsimonious. I will ask the question, whether all external representations are necessarily spatial, visual and stable? Kirsh claims that " key difference between internal and external representations (...) is their difference in stability and persistence over time" (Kirsh, 2010, p. 447). This claim seems to be dubious. The argument against it will be developed in three steps. First part justifies the claim that Kirsh analysis of external representations is based upon incomplete distinction between external and internal representations. The distinction is incomplete because it ignores the fact that not every external representation is spatially stable and persistent over time (e.g. speech acts, sign language). It will be argued that even though, Kirsh mention spoken words as an example of external representation, in fact his analysis is confined to graphical representations (e.g. maps, receipts, mathematical notation, video in choreography, models in architecture etc.). The second part is devoted to answer the question what are the threats of assuming that all external representations are persistent and stable. If we classify oral utterances as belonging to broader class of external representations, we will be prone to ignore the specific consequences of spoken language as transient phenomena, and ascribe to it concequences typical to graphical representations (Linell, 2004). This conclusion would be unjustified in the light of anthropology of communication (Finnegan, 1988) and psychology of reading (Homer, 2009; Olson, 2013) . Even though ethnography of external representation pays special attention to material dimension of external representations, it left no space for transient representations which are both material and external. Third part of the presentation justifies the claim that more fine grained classification of external representation is needed. In order to do so I will use classification based on classical typology of signs in semiotics (Heersmink, 2013).

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