Short Term Memory May Be the Depletion of the Readily Releasable Pool of Presynaptic Neurotransmitter Vesicles

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Abstract

The Tagging/Retagging model of short term memory was introduced earlier (1) to explain the linear relationship that exists between response time and correct response probability for word recall and recognition: At the initial stimulus presentation words tag the corresponding long term memory locations. The tagging process is linear in time and takes about one second to reach a tagging level of 100%. After stimulus presentation the tagging level decays logarithmically with time to 50% after 14 seconds and to 20% after 220 seconds. If a probe word is reintroduced the tagging level has to go back to 100% for the word to be properly identified, which leads to a delay in response time. This delay is proportional to the tagging loss which is in turn directly related to the decrease in probability of correct word recall and recognition. Evidence suggests that the tagging level is the level of depletion of the Readily Releasable Pool (RRP) of neurotransmitter vesicles at presynaptic terminals. The evidence includes the initial linear relationship between tagging level and time as well as the subsequent logarithmic decay of the tagging level. The activation of a short term memory may thus be the depletion of RRP (exocytosis) and short term memory decay may be the ensuing recycling of the neurotransmitter vesicles (endocytosis).

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Metadata

- METS
- MODS
- OAI-ORE Resource Map (Atom Format)
- OAI-ORE Resource Map (RDF Format)
- OpenURL ContextObject
- OpenURL ContextObject in Span
- RDF+N-Triples
- RDF+N3
- RDF+XML
- Refer
- Reference Manager
- Search Data Dump
- Simple Metadata
- YAML

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