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Attentional mechanisms in static and dynamic cocktail-party listening

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ABSTRACT

Verbal communication often takes place in situations with several simultaneous speakers. This was coined by the term “cocktail-party problem” (1). These situations pose high demands on both the auditory system as well as cognitive capacity of the listener. Particularly attentional mechanisms appear to be crucial for cocktail-party listening: In a “static” situation the aim is to focus attention on one talker and to ignore the competing background (2). However, dividing and switching attention also play a role since the talker of interest may change dynamically from time to time in an unpredictable manner (3, 4, 5).

Since both hearing and cognition typically decline with age (6) it is important to shed more light on attentional mechanisms associated with cocktail-party listening. Therefore, we investigated performance of young and older listeners in a static and a dynamic three-talker paradigm. Target sentences indicated by a particular call-sign were presented with (static situation) and without (dynamic situation) a priori knowledge about the talker of interest. Different types and probabilities of switching were considered in the dynamic situation.

In the static situation all listeners performed at a very high level. Hence, robust cues for auditory streaming – such as voice and location of the talker - were given in the multitalker paradigm. In the dynamic condition performance dropped significantly, even when target talker switches occurred only rarely. However, the two age groups performed relatively similarly, at least when older participants with good hearing and good cognitive abilities were taken into account.

The presentation disentangles different attentional mechanisms, such as focused attention in the static situation and dividing and switching attention in the dynamic situation.

Keywords: Cocktail-Party, speech recognition, attention, aging

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