Dual Task- Development and validation

The development of the dual task was informed by the biased competition model of visual selection [1] according to which neural activity is biased in favour of object features held in WM. Facilitation of visual attention by WM is typically studied by asking participants to memorise content (a WM template) overlapping with the target of attention [2]. Guidance of attention by WM has been observed at early stages during encoding [3] as well as during and after information is consolidated in WM [4]. Moreover, the guidance was absent when cues were primed but not encoded in WM for later report [3]. This effect has been replicated in studies using functional magnetic resonance imaging [5] and event-related potentials [6]. The paradigm has been applied to visual search displays containing shapes and simple objects [3, 2], and more recently to real-world objects and scenes [7] and facial expressions [8].

 In line with previous research, participants in this study were required to complete the (dual) combined WM and visual search task. Only one face was displayed during encoding of the WM template due to limited capacity for face memory [9, 10]. To ensure that the encoding of the WM template was directly relevant to the task [11] the match/no-match test was displayed at the end of each trial. The search array following the encoding display was a similar design to the visual search task using naturalistic face stimuli developed by Burra et al [12]. As WM templates and targets had the same identity (and the same emotional valence in half of the trials), additional checks were conducted to exclude the possibility of participants responding to the gender of the target based on the memorised WM template. Specifically, RTs were plotted and inspected for each participant and revealed a stable RT pattern as opposed to a learning pattern, indicative of reliance upon information stored in WM.

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