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Holistic processing of left-right and top-bottom composite faces

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Abstract

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composite, bottom, top, right, left, faces, processing, holistic

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Holistic processing of left-right and top-bottom composite faces.

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The composite task involves matching or identifying a target half of a face when that half is aligned or misaligned with another face half. Performance is poorer in aligned conditions due to perceptual integration of the two halves, that is, holistic processing, making it difficult to isolate the target half. This composite effect is robust and found across different conditions. With a few exceptions, however, the top half of the face is the target half to be matched or identified. And while composite effects have been found for top, bottom, left, and right face target halves in different studies, as yet none have directly compared these effects. It is unclear whether perceptual integration is as strong across left-right composite faces as it is across top-bottom composites. In this study, we compared performance on a composite matching task across four target types (top, bottom, left, and right face half). Composite effects were found in all upright conditions with the effect magnitude smallest for right half and largest for bottom half targets. Overall results suggest while holistic processing is evident in all conditions, performance may be influenced by a right hemisphere advantage for holistic processing and the eyes attracting attention.

How does modality, speaking style and phonetic feature affect cross-language speech perception?

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Native language attunement may lead to difficulties perceiving differences between certain non-native speech sounds. The Perceptual Assimilation Model (PAM; Best, 1995) predicts that cross-language discrimination ability is determined by the way non-native speech is assimilated to native language categories. To date, these discrimination predictions have been typically tested in auditory-only conditions. Therefore, it is still unknown whether visual and/or clearly articulated speech enhances cross-language speech discrimination. Monolingual Australian-English listeners were presented with pairs of non-native Sindhi consonants (/t̪/-/ʈ/, /b/-/ɓ/) across auditory-only (AO) and auditory-visual (AV) conditions, in clear and citation speech. PAM predicts that discrimination should be poor because the consonants in each pair are assimilated to the same English consonant category. For the bilabial voiced plosive/implosive pair /b/-/ɓ/ (a laryngeal feature difference), AV was discriminated more accurately than AO in citation speech, but not in clear speech, while for the voiceless dental/retroflex pair /t̪/-/ʈ/ (a place-of-articulation difference), the reverse was found, where AV was discriminated more accurately than AO, for clear, but not for citation speech. These results highlight the multimodal nature of perception, where perceivers attempt to utilise even subtle visual speech differences, but speaking style and modality differentially contribute to successful cross-language speech discrimination.

How do masked primes affect targets?

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The masked congruence effect (MCE) is characterized by faster response times (RTs) and higher accuracy rates to congruently primed targets than incongruently primed targets. According to one general set of "head-start" accounts (direct parameter specification, action trigger, rapid-chase), prime processing is thought to begin influencing the response formulation process before the target has been presented and consciously perceived. In contrast to the head-start accounts are the "integration" accounts, where it is argued that the accumulation of evidence for the correct response is integrated across the prime and target, almost as if visual system has been "tricked" into treating the prime and target as a single perceptual object (cf. Norris & Kinoshita, 2008). While both sets of accounts correctly predict the observed RT differences, they make distinct predictions in terms of how responses are formulated early on in stimulus processing. The aim of the present study is to distinguish between these accounts by using the reach-to-touch paradigm to establish how the MCE emerges within the first 150ms of stimulus processing.