

Less Is More in Visual Perception and Preference: A Surprising and Powerful "Partial Information Effect" in Face Processing

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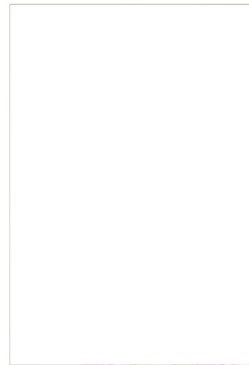
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background and motivation

our conscious, supposedly rational thoughts and actions are overwhelmingly driven by unconscious, hedonic, highly counter-intuitive (and often very error-genic) influences

our social perceptions, interactions, and attitudes, for example, are thoroughly contaminated by the most superficial influences, particularly visual factors such as physical attractiveness; worse, these factors in turn, as we now demonstrate, are themselves prey to the most trivial and ubiquitous low-level manipulations



*cuteness is a virtue
(and we can remember it for you wholesale)*

while much attention has been directed to the study of facial features influencing attraction and liking, we've recently focused on even lower-level image properties visually driving preference

by shifting the analysis from face variables to image properties we also move from specialized mating-strategy / social-cognitive explanations to what may rather be universal aspects of perception, memory, and affective response at the most fundamental levels

following a processing fluency framework -- but invoking *internal goodness-of-fit*, not external stimulus clarity -- we show situations that *diminish* input can, from the con(tribut[us]ion of perception and memory, counter-intuitively *enhance* preference and attraction

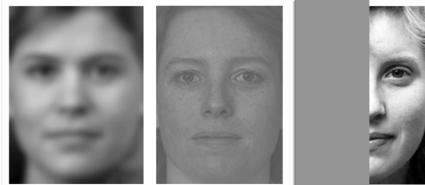
in previous work (Fatke et al, under revision) we showed that human adults, like infants, have a remarkably preserved ability to reliably judge facial attractiveness under *extreme* levels of blur...



here we further show, in mixed arrays, that *reduced* visual input very consistently and overwhelmingly *increases* attraction

reducing visual input, measuring attractiveness

successful visual perception contends with the ubiquitous and continuous challenges of at-a-distance, unaccommodated, or eccentric views of objects; of cast shadows and low light; of partial views, in the presence of yet other interposed objects

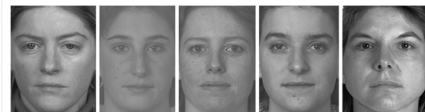


experiment 1 blur *experiment 2 contrast* *experiment 3 occlusion*

here we study the influence of limited visual information directly: experimentally, gaussian blur simulates distance and eccentric viewing (and effectively lower resolution); linear contraction of the luminance histogram parametrically reduces contrast, as in shadows and low light; and sneaky Gestalt tricks nicely simulate interposition of occluding objects, producing partially visible faces



each experiment used 100 novel female faces from the FERET db, randomly assigned to 5 blur, 5 contrast, or 2 occlusion conditions, respectively; stimulus pre-processing (a subset of *SHINE* routines) ensured all source images have the same luminance histogram and thus the same starting level of brightness, contrast, etc



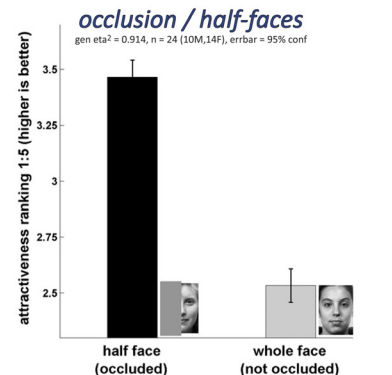
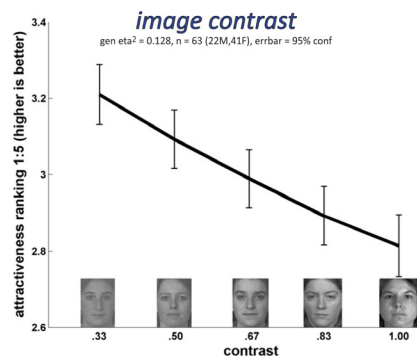
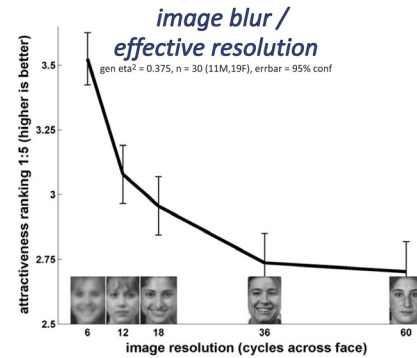
with the images presented in randomized sets of five faces, subjects' task was to rank order from most to least attractive; subjects typically completed the 20 sets of five faces in approximately 8 - 12 minutes, seeing each face only once, followed by a second block in which all 100 faces were ranked a second time in newly randomized sets of five



sample set of five FERET face images, each randomly assigned to the whole- vs half-face conditions, presented in random left-to-right order prior to subjects' manually ranking them by attractiveness; "drop shadows" and T-junctions conjure an "occluding" grey panel -- the ecological percept that each face is half obscured/occluded rather than merely (and inexplicably) half-absent/-erased (expt 3)

surprisingly powerful effect: we prefer less input

across all three experiments we find a very strong effect of *reduced* visual input *increasing* perceived attractiveness -- an exciting and surprisingly counter-intuitive result



summary and conclusion: the partial information effect

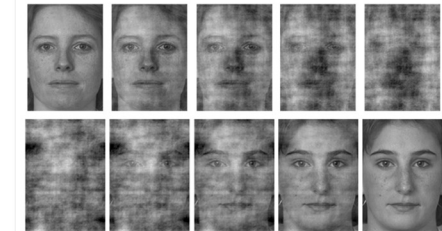
across three experiments -- blur, contrast, occlusion -- in which subjects performed the simple, natural task of rank-ordering faces by attractiveness, we find a very consistent and powerful effect of *reduced* visual input *increasing* perceived attractiveness

the blur manipulation exhibits a classic exponential profile, the contrast manipulation follows a simple linear trend, and a 50% occlusion results in a ~40% increase in attractiveness

(*en passant*, one may provocatively note that half-faces, which have no symmetry whatsoever, are profoundly more attractive than [bilaterally symmetric] whole faces, posing further questions about beauty and symmetry and a puzzle for holistic processing)

as with our earlier work, our findings contradict more simplistic views of processing fluency and stimulus clarity, revealing instead a "less is more" relation btw visual input and hedonic output -- suggesting a perceptual/mnemonic *goodness-of-fit* is enhanced, precisely *because* of the underspecified nature of the input

extensions and related work



the *RISE* technique (Sadr & Sinha, 2001, 2004) allows an ideal extension here, to examine this partial-information enhancement using degraded images where coherent information/structure is parametrically reduced *without* blur, contrast change, or occlusion



likewise, we are finding very interesting structure in our analyses of *individual* faces' manipulations by these techniques and links to computational sorting algorithms and machine learning systems

further reading...

Sadr, J & Krowicki, L (2019) Face Perception Loves a Challenge: Less Information Sparks More Attraction. *Vision Res.*, 157, 61-83

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