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Thatcher's Britain: A New Take on an Old Illusion

Abstract

The Thatcher Illusion is generally discussed as phenomenon related to face perception. Nonetheless, we show that compellingly strong Thatcher Effects can be elicited with non-face stimuli, provided that the stimulus set has a familiar standard configuration and a canonical view. Apparently, the Thatcher Illusion is not about faces, nor is it about Thatcher. It just might, however, be about Britain.

In 1980 Peter Thompson turned the world of face perception on its head by introducing the "Thatcher Illusion" (Thompson, 1980). The process of what is now commonly referred to as "Thatcherization" consists of inverting the mouth and eyes of the image of a face, whilst maintaining their normal location in the global configuration of the face. The resultant images, when presented upright are immediately perceived as "wrong" or even "grotesque". However, when they are presented upside down it is exceptionally difficult to distinguish them from inverted normal faces, even when they are presented with such side-by-side. This phenomenon is lovingly known as the "Thatcher Effect" (TE). The illusion has served as a valuable experimental tool to address varied questions relating to mechanisms of face perception (e.g., Talati et al., 2010); neural characteristics of such mechanisms (e.g., Psalta et al., 2014); clinical deficits in face processing (e.g., Joshua & Rossell, 2009; Rouse et al., 2004); other-race effects (Hahn et al., 2012); emotion perception (e.g., Muskat & Sjoberg, 1997); and face perception in non-human primates (Weldon et al., 2013).

Numerous explanations have been proposed to account for TEs; many of which centre on the idea that inversion disrupts hard-wired mechanisms for holistic face processing (e.g., Bartlett & Searcy, 1993). Other explanations implicate the interplay of distinct processes for local and global processing of facial features (e.g., Carbon et al., 2005). A more recent suggestion is that the illusion is partially explained by implicit "shape-from-shading" assumptions predicated upon an overhead source of illumination (Talati et al., 2010).

Such explanations are generally couched in terms of face specific processes. Attempts to "Thatcherize" other types of stimuli including houses (e.g., Rouse et al., 2004) and bikini-clad models (Anstis, 2009) have enjoyed only limited success. Where evidence exists for non-face stimuli eliciting the TE, the effect is demonstrably weaker compared to those elicited by faces (e.g., Wong et al., 2010).

Here we argue that the apparent weakness of non-face TEs may rest upon the choice of stimulus materials. A full frontal upright depiction of a face may be considered "canonical" (e.g. when we converse with another individual we generally present face-on; when a child draws a face it is most commonly face-on), but "canonical" viewpoints do not obviously exist for many non-face stimuli used in previous TE experiments.

Houses may be the exception that proves the rule: Yes, houses undoubtedly have a top and a bottom. But the resulting "standard" configuration can be quite face-like (Figure 1) thus obviating their utility as "non-face" stimuli.

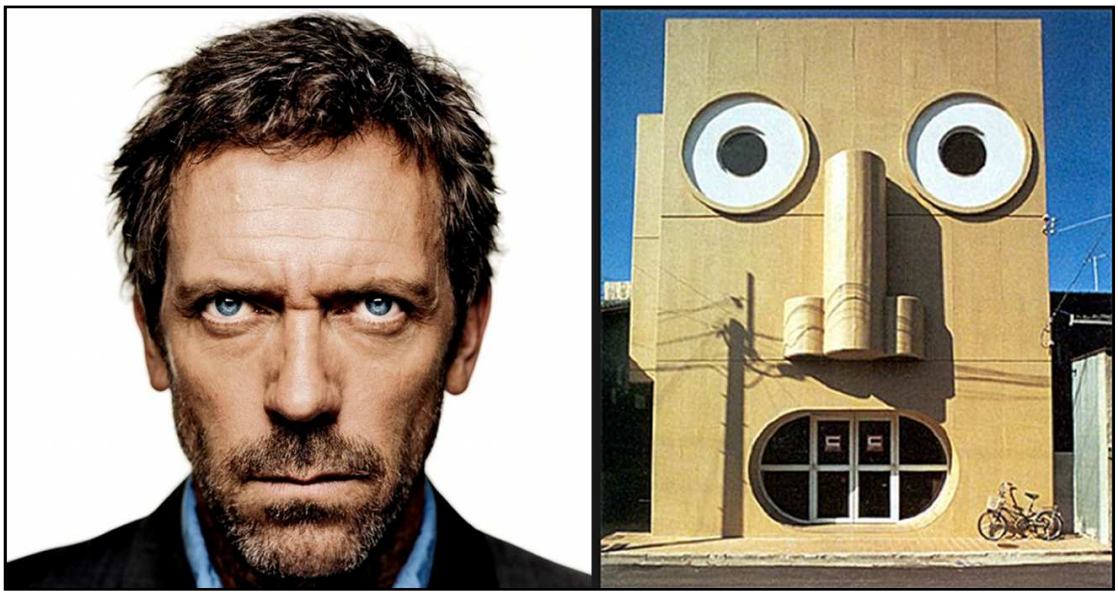

Fig 1. House and Face, or Face and House?

We reasoned that clear TEs would be producible using stimulus types for which there is both a standard configuration (including substructural elements) and a canonical viewpoint. Fortunately, satisfying such desiderata are Macroscale Geographical Entities (MaGgiEs) such as the British Isles. MaGgiEs, being singular, have a "standard configuration", but are subject to a proliferation of schematic and photographic exemplar images. Moreover, the cartographic convention of representing such entities on a Euclidean plane oriented North(top)-to-South(bottom) furnishes us with a canonical viewpoint.

Using Adobe Photoshop, we manipulated freeware satellite images of the British Isles by rotating Ireland around its horizontal or vertical axis. Four image pairs (each consisting of one manipulated and one unmanipulated MaGgiE) were created; two with a non-canonical (north-down) view (Figure 2) and two with the canonical view (Figure 3). Each pair was displayed to a lecture hall seating approximately 100 undergraduate students. Using handheld wireless 'clickers', their task was to indicate (as quickly as possible) which image in each pair

accurately depicted the British Isles. Responses that took longer than 5 seconds were discounted. (These experimental procedures were approved by the Department of Psychology Ethics Committee at University of York).

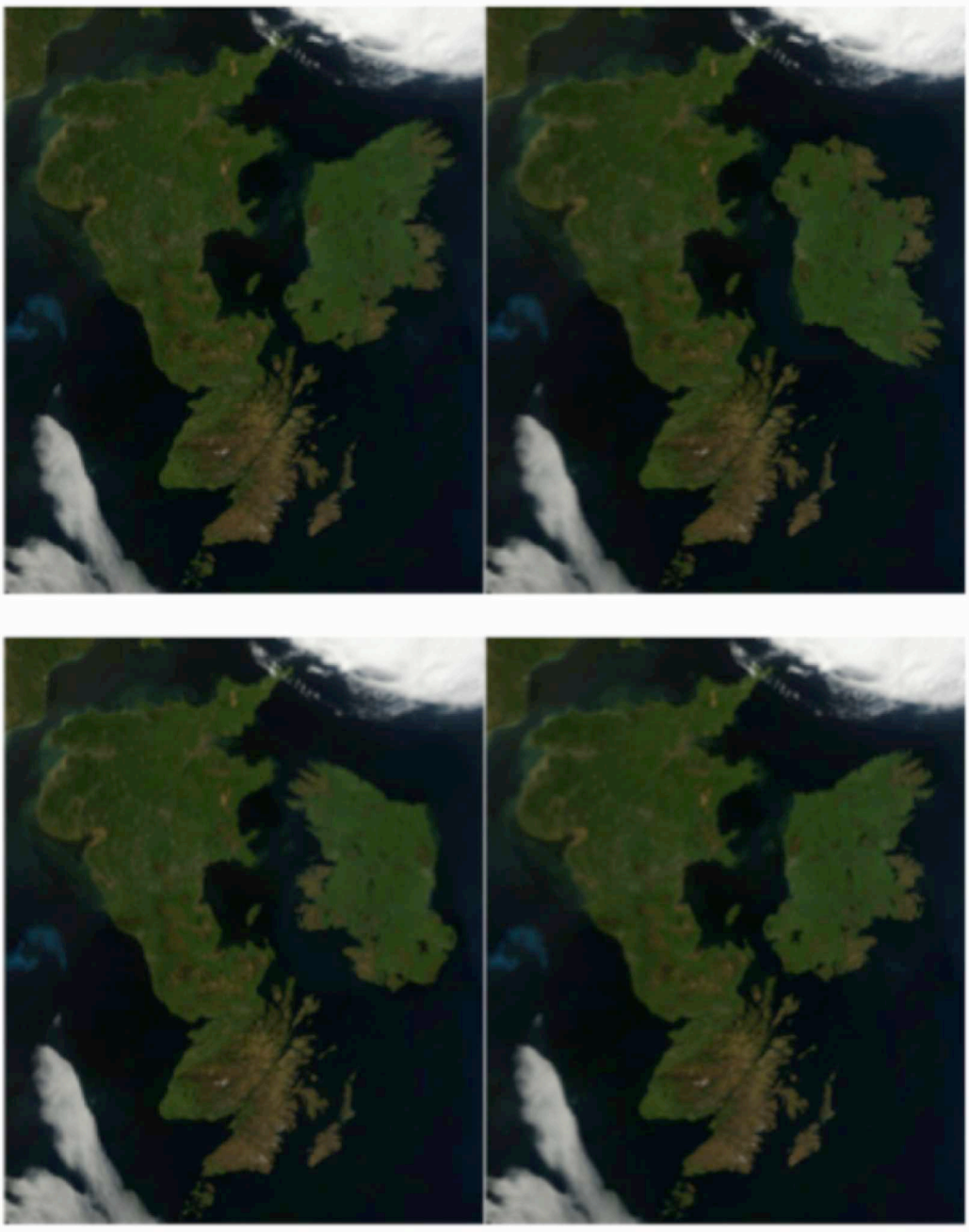

Fig 2. Non-canonical Pairs. **(Top)** Normal (left) and vertically manipulated MaGgiE (right). **(Bottom)** Normal (right) and horizontally manipulated MaGgiE (left)

Fig 3. Canonical Pairs. **(Top)** Normal (left) and horizontally manipulated MaGgiE (right). **(Bottom)** Normal (right) and vertically manipulated MaGgiE (left)

Pooling data from the horizontal and vertical manipulations gave us 84 upright and 70 inverted responses. Participants were near ceiling for upright images (94% correct)—indicating that they readily identified the manipulated map in its canonical view. However, this ability was lost when the map was rotated, as the non-canonical view elicited near chance performance (43% correct).

We conclude that Britain's MaGgiE is at least as effective at eliciting the TE as its namesake ex-prime minister. And, just as the TE has been shown to work with non-Thatcher faces, we expect it may be so for other MaGgiEs that share these common features. Indeed, the Thatcher illusion appears to have little to do with Thatcher or faces, but is likely to result from any stimulus for which there is both a canonical view and a sufficiently familiar standard configuration of features. Well, either that, or the illusion is really all about Britain.

Acknowledgments

We would like to note that Professor Peter Thompson, when approached about this work, muttered something about "never hearing the end of it."

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