The illusory perception of distinctiveness in familiar faces

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Abstract

An illusion of distinctiveness for faces is described that manifests as a positive association between perceived familiarity and perceived distinctiveness. This association seems partly rooted in intrinsic facial characteristics but is boosted by actual exposure to faces. Such illusion could impede research on familiar faces where distinctiveness is manipulated or controlled and researchers will need to find ways around it.

Familiar face processing is frequently studied with tasks involving famous pop stars, actors or politicians. Research consistently shows high performance in recognition and matching tasks compared to unfamiliar faces (for reviews, see Johnston & Edmonds, 2009; Natu & O'Toole, 2011). While this body of work might give the impression we know everything there is to know about familiar face processing—that it is really good indeed—, recent work in my lab suggests it could gain in nuance by taking notice of individual facial factors such as how famous people are or what they look like (Devue et al., 2019; Devue & Sena, 2023). For example, we showed in a series of experiments that how often an actor changes their look affects the reliability of memory representations for their faces. This impact of stability in appearance is modulated by media exposure (Devue & de Sena, 2023). Specifically, in a recognition task, actors with less media exposure (as indexed by Internet Movie Database rankings, https://www.imdb.com) were more often recognised if they sported a stable look than if their look varied more. However, for actors with higher media exposure (who were better recognised overall), those with a variable look were better recognised than those with a signature look. In fact, this finding was so consistent across experiments that I started to question the material's validity and actors' selection. Perhaps actors who are more easily recognisable, due to uncontrolled individual facial characteristics, were overrepresented in conditions where performance was higher. One potential uncontrolled culprit was distinctiveness, known to facilitate face recognition (Wickham et al., 2000).

To ease my mind, I collected familiarity and distinctiveness ratings (7-points Likert scales) from 35 independent judges (Mean age = 19.80 ± 3.10) on the image set (i.e. 96 actors with higher/lower media exposure, 96 strangers). For familiarity ratings, instructions emphasised familiarity with the visual aspect of the face rather than semantic knowledge[1]. For distinctiveness ratings, instructions contrasted typical and distinctive faces and encouraged participants to disregard any familiarity with the face[2]. The two types of ratings were

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[1]Full instructions were: "The FAMILIARITY rating should reflect your level of familiarity with the face, that is how much you feel that you have seen that person's face before, how much you feel that you know that face. Your rating should NOT reflect how much you know about the person (for example, their name or facts about them), but how much you know THE FACE ITSELF. So even if you do not remember who the person is, or you can't place them, you could still rate the face as very familiar."

[2]Full instructions were: "A distinctive face is a face that has a unique look or some very particular features. For example, you can imagine that a person with a very distinctive face would be very easy to pick in a crowd if you were waiting for them on a platform. By contrast, a face that is not at all distinctive would be a face with a typical or average look, in which nothing really stands out. It might be difficult to judge how distinctive

averaged per individual face (i.e. actor or stranger) to be used in two item-level Pearson's correlational analyses. The analysis on actors revealed a strong significant positive association between familiarity and distinctiveness, $r = 0.751$ (details in **Table 1**)[3]. The same analysis on strangers revealed a non-significant positive association, $r = 0.174$.
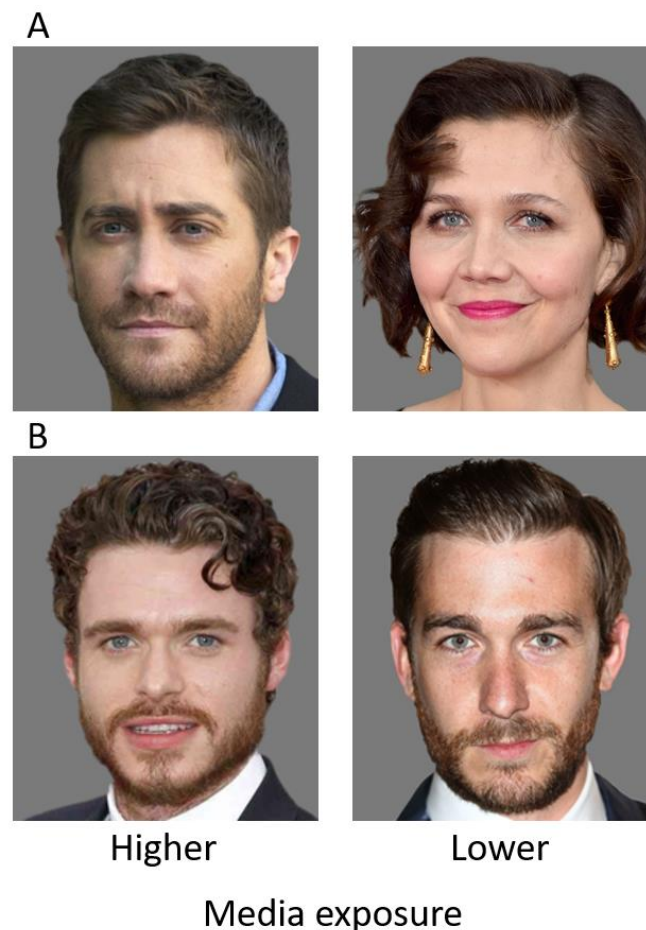
Figure 1. Examples of actors with higher or lower media exposure from the two image sets that received familiarity and distinctiveness ratings ([A] Devue & de Sena, 2023; [B] Devue et al., 2019). Data suggest the more people seem familiar, the more distinctive they seem too. Is Jake Gyllenhaal (top left) really more distinctive than his sister Maggie (top right)? How about the two Game of Thrones actors below (Richard Madden and Philip McGinley)?

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someone's face is when you know them very well. In this case, try your best to imagine how much the face of that person would stand out if you did not know them."

[3] Separate analyses on the 48 stable and 48 variable actors showed that the positive association existed in both image samples ($r = .66$ and $r = .81$, respectively, both ps < 0.001) and that the two actor categories had comparable mean familiarity and distinctiveness ratings (which reassured me about my materials).

Although the positive association between familiarity and distinctiveness was only significant with actors, I was still puzzled. Had I uncovered some kind of illusory perception of distinctiveness for well-known faces or were famous actors actually more distinctive? After all, it could be that actors who become famous tend to be those with unusual faces—unless it is the excesses associated with fame that make their faces unusual. To objectify a possible illusion of distinctiveness and test for a causal role of visual exposure, ratings by a group of people that had been exposed to specific faces and a group that had not were probably the way to go.

Luckily, such ratings were obtained on another picture set used in Devue et al. (2019), consisting of Game of Thrones (GoT) actors and strangers. Like in the abovementioned picture set, actors had varying degrees of media exposure. Amongst 50 judges, 25 reported they had watched all GoT seasons (watchers, Mean age = 19.12 ± 7.10) and 10 reported they had not watched any (non-watchers, Mean age = 23.40 ± 8.67). Ratings from these two groups were averaged separately for each individual face (i.e. actor or stranger), resulting in four ratings (i.e. familiarity and distinctiveness by watchers and non-watchers) per face to be used in item-level Pearson's correlational analyses. Analyses on 60 actors (main, support and lead roles) revealed a strong positive association between familiarity and distinctiveness in watchers, $r = 0.730$, and a weak non-significant positive association in non-watchers, $r = 0.243$ (details in **Table 1**)[4]. The same analysis conducted on 90 strangers showed a very weak non-significant positive association between the two types of ratings in watchers, $r = 0.171$, and a weak significant positive association in non-watchers, $r = 0.357$.

Crucially, although the positive association between perceived familiarity and distinctiveness existed even with unfamiliar faces, it was much stronger when judges rated faces they had been substantially exposed to than in any other condition. Indeed, a Fisher r-to-z transformation was used to compare the strength of that large association (i.e. $r = 0.73$) and of the largest association obtained on faces unfamiliar to raters (i.e. $r = 0.357$) and showed that the former was significantly larger than the latter, $Z = 3.26$, $p = 0.001$.

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[4]Note that ratings on 30 bit parts who were not recognised by most participants in the original study were analysed separately and revealed very weak non-significant associations between familiarity and distinctiveness in watchers, $r = -0.033$, and in non-watchers, $r = 0.110$.

Table 1. Mean ratings and results of item-level correlational analyses testing the association between familiarity and distinctiveness ratings in two distinct picture sets.

Picture set	*N* judges	Face type	*N* faces	Mean Familiarity (*SD*)	Mean Distinctive-ness (*SD*)	*r*	*p*	Lower 95% CI	Upper 95% CI
Devue & de Sena, 2023	35	Actors	96	4.46 (*1.53*)	4.40 (*0.78*)	**0.751**	< 0.001	0.648	0.827
	35	Strangers	96	1.71 (*0.25*)	3.22 (*0.5*)	0.174	0.089	-0.027	0.362
Devue et al., 2019	25 GoT watchers	Actors	60	4.31 (*1.32*)	4.42 (*0.71*)	**0.730**	< 0.001	0.585	0.830
		Bit parts	30	2.43 (*0.44*)	3.89 (*0.66*)	-0.033	0.861	-0.389	0.331
		Strangers	90	2.21 (*0.37*)	3.33 (*0.72*)	0.171	0.107	-0.037	0.365
	10 non-watchers	Actors	60	2.23 (*0.60*)	4.04 (*0.72*)	0.243	0.061	-0.011	0.468
		Bit parts	30	2.12 (*0.58*)	4.10 (*0.84*)	0.110	0.564	-0.261	0.452
		Strangers	90	1.93 (*0.52*)	3.40 (*0.92*)	**0.357**	< 0.001	0.162	0.526

Furthermore, paired sampled t-tests conducted at the actor level showed that mean distinctiveness ratings of the 60 GoT actors obtained from watchers were higher than those obtained from non-watchers (see **Table 1**), *t*(59) = 5.511, *p* < 0.001, *d* = 0.711, 95% CI [0.425 – 0.993]. In contrast, distinctiveness ratings obtained from watchers and non-watchers on the set of 90 strangers' faces did not differ significantly, *t*(89) = -0.98, *p* = 0.33, *d* = -0.103, 95% CI [-0.31 – 0.104].

Table 2. Results of item-level correlational analyses testing the association of ratings from judges exposed and not exposed to GoT actors (picture set from Devue et al., 2019).

Rating type	Face type	*N* faces	*r*	*p*	Lower 95% CI	Upper 95% CI
Familiarity	Actors	60	**0.432**	< 0.001	0.200	0.618
	Bit parts	30	**0.406**	0.026	0.054	0.669
	Strangers	90	**0.439**	< 0.001	0.256	0.593
Distinctiveness	Actors	60	**0.725**	< 0.001	0.578	0.827
	Bit parts	30	**0.834**	< 0.001	0.678	0.919
	Strangers	90	**0.738**	< 0.001	0.626	0.820

Finally, **Table 2** shows (very) strong associations in all face categories between distinctiveness ratings obtained from judges who watched and those who did not watched GoT. Such high agreement between ratings regardless of actual exposure of raters points to a clear contribution of intrinsic facial characteristics to perceived distinctiveness. Moderate

relationships between familiarity ratings from the two groups suggest that perceived familiarity is partly rooted in individual facial characteristics too.

In conclusion, a potentially inconvenient association between perceived familiarity and distinctiveness was uncovered. Distinctive facial information could somewhat fool observers on a face's familiarity. Likewise, familiarity with a face may trigger an illusory perception of distinctiveness, and this seems increased by objective exposure. Perhaps facial features that are the most diagnostic of a specific identity receive more representational weight over time, as representations refine (Devue & de Sena, 2023). This could in turn make these features appear to stand out. Researchers willing to build picture sets of highly familiar faces adequately controlling for familiarity and distinctiveness will need to find ways to go around this association.

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