Non Inversion of Similarity and Dissimilarity in Judging Faces

Ludovica Lorusso (lorusso@uniss.it)
Department of Economics
Via Muroni, 25, Sassari, 07100 Italy

Enrico Grosso (grosso@uniss.it)
Department of Political Science, Communication and Computer Engineering
Viale Mancini, 5, Sassari, 07100 Italy

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We propose a model for three judgments involving a measure of similarity and dissimilarity between faces: the similarity judgment (Sj), the dissimilarity judgment (Dj), and the kinship judgment (Kj), which has been demonstrated to be strongly related to the Sj (Lorusso et al., 2011; Maloney & Dal Martello, 2006).

A previous model for Sj and Kj between faces (see i.e., Maloney & Dal Martello, 2006) suggests a common visual pathway for both the judgments where a similarity measure of *similarity cues* also named "kin signals" is required as a necessary step to judgment of both similarity and kinship. DeBruine et al. (2009) found that the observed correlation between Sj and Kj *depends on the face stimulus presented*: whenever face-pairs differ in age or sex, a similarity measure is not found as a criterion of kinship evaluation. The model we present here is based on the results obtained in a recent work (Lorusso et al., 2011). These results showed significant differences in response time for Sj, Dj, and Kj on different face-pairs categories previously defined on the base of an experiment of similarity ratings. Participants took on average about half a second less to respond to stimulus pairs rated as dissimilar than to either those rated as similar or those exhibiting kinship. Moreover, on average participants took about a third of a second longer to judge kinship than to judge similarity. A slight difference was also found between Kj and Dj. Finally, a priming study showed a strong priming of Sj on Kj and vice versa. A strong priming was also observed of Dj on both Sj and Kj. However, the priming effect was suppressed whenever Sj and Kj were given before Dj: in this case, for example, a positive Dj followed a negative Sj and Kj with a chance level frequency. These results suggest a new scenario in which judgments of similarity, dissimilarity and kinship of faces are modulated by both the task and the stimulus and where different visual and cognitive pathways are involved during each of them. Moreover, Sj and Dj cannot be considered in a logical opposition between each other. Our model - sketched in Figure 1 - suggests that any specific task leads the observer to process specific pools of facial features and use that information in order to complete the judgment. The fact that Sj and Dj show a non inversion is explained in the model by hypothesizing that they rely on a processing of different pools of visual information, respectively the similarity and dissimilarity pools in Figure 1.

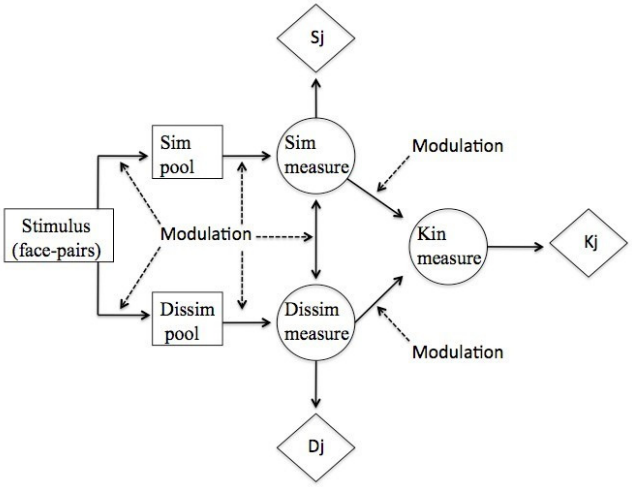

Figure 1: The new model for similarity, dissimilarity and kinship judgments of faces.

The model assumes that Sj and Dj occur sooner than Kj since they only require a very simple processing of the two pools: they may be therefore reduced to elementary similarity/dissimilarity measures. Kj is the slowest since it involves a more complex processing of the two pools, and therefore it cannot be reduced to a simple similarity measure of similarity cues. In the model the similarity measure represents only one of the possible strategies used in a complex judgment as a Kj - likely the strategy adopted in the case of faces perceived as highly alignable like faces matching for sex and age. Finally, the strong correlation between Kj and Sj observed in the priming study may be explained to be part of a cultural modulation that we express through our anecdotal association of the concept of kinship with similarity.

References

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