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SHORT NOTE

VARIOUS KINDS OF FACE FAMILIARITY AND A SHORT REPORT ON A CASE OF PROSOPAGNOSIA

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The present paper reviews psychological and neuropsychological (brain-damaged and normal subjects) reasons for dissociating various forms of face familiarity on the basis of the encoding level and the nature (stimulus vs face vs person) of the material that becomes familiar. A case of prosopagnosia in which a dissociation appeared likely between defective processing of famous faces and a preserved processing of familiar faces is briefly described.

It is almost a truism that familiar and unknown faces refer to distinct objects on the psychosocial level. Experimental psychology supports this dissociation by showing that visual analysis of faces differs in the function of familiarity (Hay & Young, 1982) and the output of a familiarity check (Ellis, 1983). In addition, both everyday experience and experimental psychology (Hay & Young, 1982) give evidence for distinctions between the person, the face, and the stimulus (see also Bruce & Young, 1986; Young, Hay & Ellis, 1985).

Neuropsychology, in its turn, furnishes data supporting these dissociations. The syndrome of prosopagnosia illustrates the latter distinction dramatically: prosopagnosic subjects do not recognize familiar faces, but they do recognize the persons to whom they belong by means of nonfacial information like clothing, paraphernalia, gait, voice, or other contextual cues (Bruyer, in press). Moreover, the dissociation between new and familiar faces is supported by experimental neuropsychological data. First, prosopagnosics are generally able to process unfamiliar faces in spite of their inability to recognize familiar ones (Bruyer, in press). Second, even if right brain-damaged subjects are defective in processing both familiar and unknown faces, the lack of correlation between these defects suggests that different right-injured subgroups are responsible for them (Warrington & James, 1967). Third, the studies in which neurologically normal subjects are presented with faces in the lateral hemifields globally show a left-field advantage for unfamiliar faces and a right-field

superiority for the familiar ones (Bruyer & Stroot, 1984; Marzi & Berlucchi, 1977; Marzi, Brizzolara, Rizzolatti, Umiltà & Berlucchi, 1974; Umiltà, Brizzolara, Tabossi & Fairweather, 1978; see also Glass, Bradshaw, Day & Umiltà, 1985 but see Levine & Koch-Weser, 1982). However, the decision of familiarity could be a right hemisphere function (Young, Hay, McWeeny & Ellis, 1985; but see Glass et al., 1985).

Nevertheless, there are neuropsychological, psychological, and experiential arguments suggesting various forms of face familiarity. At least four kinds of familiarity can be usefully distinguished. When a few unknown faces are individually displayed in a large series of trials a familiarization process develops in the course of the experiment, and it has been shown (Bruyer & Stroot, 1984; Ross & Turkewitz, 1982; Ross-Kossak & Turkewitz, 1986) that the pattern of brain asymmetry varies during this process, likely interacting with individual cognitive strategies. Since the same photographs are generally used from trial to trial, this first type of familiarization may be called stimulus familiarity (Hay & Young, 1982; see also the $2\frac{1}{2}$ and 3D representations proposed by Marr, 1982). Another kind of familiarity is involved when famous faces are used. Now faces, not stimuli, are involved, given the broad diversity of material presentation: faces are presented with various emotional expressions, poses, and orientations. In addition, information about the person is processed together with the face, e.g., information about the voice, clothing, business, or name. However, the encoding of such faces remains relatively superficial, given both the rather stereotyped cognitive representation of the material and the lack of a personal relationship with the subject. A variation of this second kind of familiarity concerns those people who are met regularly in a fixed setting (e.g., on a train when commuting work) but who have no personal relationship with the subject who, probably, does not even know their names. Finally, there are the "familiar" persons in the usual sense, i.e., people involved in the daily personal activities of the subject. One can reasonably suppose that these faces are encoded and stored in a deeper manner.

Apart from the obvious phenomenological reasons for distinguishing these various forms of face familiarity, there are neuropsychological data that suggest that different patterns of brain asymmetry result in the function of the level of face encoding (Galper & Costa, 1980; Proudfoot, 1982). Another way of validating the dissociation between famous and familiar faces would be the occurrence of a particular type of prosopag-

nosia where the processing of one category of material would be impaired and the other category preserved.

Accordingly, we would like to illustrate this short note by describing briefly such a prosopagnosic subject. Due to local constraints, a detailed experimental analysis could not be performed, so the description that follows is necessarily incomplete. In addition, this case report must be considered as an example, not a demonstration or a proof. Essentially, we consider this description as an illustration of the last required way of supporting the famous vs familiar faces dissociation. More precisely, we present a brain-injured prosopagnosic subject who became unable to process famous faces while his processing of familiar faces was preserved.

AVB was a male, ambidextrous chemist who suffered from long-term, well-known amblyopia and strabism. A left superior quadranopsia was observed in 1978, and an episode of peripheral visual difficulties occurred in 1983. In August 1985, at the age of 66, AVB was hospitalized due to a softening of the territory of the left posterior cerebral artery. The symptoms were a right visual field defect, alexia, micropsis, difficulties with topographical information (itineraries), and a fading of perceived colors. In addition, AVB was completely prosopagnosic for both familiar and famous face; these persons could often be recognized by means of complex logical reasoning based on vocal and contextual cues. During the ensuing weeks, these defects gradually disappeared. A neuropsychological examination was performed in October 1985. There were no impairments in oral and written language, memory, praxias, calculation, orientation, or nonvisual gnosic functions. The visual field was nearly complete. The peripheral visual troubles were likely responsible for slight perceptual difficulties in identifying drawings of common objects and, perhaps, in ranking various saturations of a monochromatic series. Familiar faces were normally recognized. AVB was perfectly able to evoke current celebrities verbally. When looking at the television, he could recognize the speakers from their voice only. AVB was presented with a series of 18 famous faces (photographs): all were adequately classified by gender, but we noted a systematic tendency to underestimate ages. When asked to identify the faces presented one at a time, AVB identified correctly only seven, and these correct responses were obviously based on nonfacial cues (moustaches or clothing). When all the faces were shown together and AVB was invited to point to faces verbally named by the experimenter, only four of the 11 previously unidentified faces were correctly identified.

In our opinion, the pathological dissociation in this case illustrates the distinction suggested earlier between two kinds of face familiarity: daily-life faces, and famous faces. It would be interesting if evidence could be found for the reciprocal dissociation, i.e., a defect for familiar faces associated with a preserved processing of famous faces. This difference could, perhaps, be linked either to the proposition that prosopagnosia deals with ambiguous stimuli (Damasio, Damiaso & Van Hoesen, 1982) — provided that famous and familiar faces possess different kinds of "ambiguity" — or to the notion of different levels of encoding for these two categories of faces. In addition, our case supports the hypothesis that bilateral damage is necessary to induce prosopagnosia (Damasio & Damasio, 1986), and it indicates that the long-term, right lesion alone did not generate the prosopagnosia which appeared only when a second, left sided damage occurred.

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