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Hemispheric resource availability influences face perception: A multiple resource approach to social perception

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Two experiments tested the hypothesis that social perception recruits distinct limited-capacity processing resources that are distinguished by the cerebral hemispheres. To test this hypothesis, social perception efficiency was assessed after relevant hemispheric processing resources were depleted. In Experiment 1 prime faces were unilaterally presented for 30 ms, after which centrally presented target faces were categorised by sex. In Experiment 2 prime faces were unilaterally presented for 80 ms after which centrally presented target faces were categorised by fame. Results showed that sex categorisation was slower after primes were presented in the right versus left visual field, and that fame categorisation was slower after familiar primes were presented in the left versus right visual field. The results support a multiple resource account of social perception in which the availability of resources distributed across the cerebral hemispheres influences social perception.

Keywords: Social perception; Social categorisation; Cerebral asymmetries; Visual field; Multiple resources.

Classic dual-process models of social perception offer a useful framework for understanding how information about familiar and unfamiliar individuals is construed (Brewer, 1988; Fiske & Neuberg, 1990; Kunda & Thagard, 1996). People are initially perceived at a group level, wherein they are categorised as members of various social groups based on the characteristics that they share with other social group members. Through repeated exposure, individuating or person-specific information is stored and individuals

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become familiar. Familiar individuals are perceived at a person level, wherein they are identified as specific individuals based on the characteristics that distinguish them from others.

Recent dual-process models have extended our understanding of group-level and person-level social perception by incorporating known visual processing asymmetries across the cerebral hemispheres (Mason & Macrae, 2004; Zárate, Sanders, & Garza, 2000). According to these models, group-level social judgements (e.g., sex categorisation) are facilitated by a facial feature identification process, through which individual or small sets of facial features are extracted in isolation (Cloutier & Macrae, 2007). Individual features have been shown to sufficiently convey social category membership (Schyns, Bonnar, & Gosselin, 2002) and sex categorisation is faster and more accurate when individual facial features (e.g., a nose, eye, eyebrow, mouth, jaw, or chin) are present than when they are experimentally or statistically removed (Burton, Bruce, & Dench, 1993; Chronicle et al., 1995; Cloutier & Macrae, 2007; Dupuis-Roy, Fortin, Fiset, & Gosselin, 2009). This feature identification process is also relatively more efficient in the left hemisphere (LH). Bourne, Vladeanu, and Hole (2009) recently showed support for this processing asymmetry by presenting configurally or featurally degraded face primes to each visual field. Configurally degraded but featurally intact prime faces produced a positive priming effect only when presented in the right visual field, left hemisphere (RVF-LH). In addition, people tend to show relatively stronger activation in the LH vs RH when determining whether individual facial features match or not (Rossion et al., 2000). Person-level social judgements (e.g., person identification), on the other hand, are facilitated by a facial feature integration process, through which a single spatial configuration of facial features is extracted (Leder & Bruce, 2000). This is supported by research showing that people are faster at identifying a specific individual when the spatial configuration of that individual's facial features is unaltered vs altered, for example, by moving the individual's mouth up or down from its original position (Leder & Carbon, 2006). Evidence suggests that feature integration is relatively more efficient in the right hemisphere (RH). This is supported by the finding that featurally degraded but configurally intact prime faces produce a positive priming effect only when presented in the left visual field, right hemisphere (LVF-RH) (Bourne et al.) and by the finding that RH activation is relatively stronger than LH activation when people are asked to determine whether entire faces match or not (Rossion et al.).

In a series of experiments, Zárate et al. (2000) showed support for these dual-process models using multiple methodologies. In Exp. 1 face primes were presented to either the left or right visual field. Consistent with the hypothesis that the right hemisphere processes facial information at a person level, mere exposure effects of previously presented (i.e., familiar) photos were demonstrated only in the right hemisphere. In Exp. 2 face primes were presented in the left or right visual field just before a lexical decision task that examined group-level stereotypes. Consistent with the hypothesis that the left hemisphere processes facial information at a group level, stereotype priming was demonstrated only after left hemisphere priming. Finally, in Exp. 3, the effect of prime/target similarity on categorisation was tested. When primes were presented in the right hemisphere, the more perceptually similar prime and target photos were (i.e., the more similar they were in terms of specific facial feature configurations), the faster target responses were. In contrast, when primes were presented in the left hemisphere, the more conceptually similar prime and target photos were (i.e., the more similar they were in terms of social group membership), the faster target responses were.

If, as these dual process models suggest, LH feature identification and RH feature integration processes facilitate group- and person-level social judgements, then interfering with these processes should interfere with these judgements. Multiple resource theory (MRT) offers a paradigm for examining process interference (Wickens, 1992, 2002). MRT predicts that interference (observed as a performance decrement on one or both tasks) will be observed when two tasks simultaneously demand similar processing resources. Boles and Law (1998) showed support for and expanded on MRT by demonstrating interference effects when two tasks simultaneously demanded the same processing resource. First, they identified a variety of processing resources that were lateralised to the LH and RH via a factor analysis of visual field task performance. Then, using a dual-task paradigm, they observed interference when both tasks demanded the same processing resource (e.g., a LH visual lexical resource; Exp. 1), but not when each task demanded distinct processing resources (e.g., a LH visual phonetic resource and a LH visual temporal resource; Exp. 3). To the extent that feature identification and feature integration processes facilitate group- and person-level social perception, respectively, making simultaneous demands on the resource that underlies each process should interfere with associated social judgements.

Because we are suggesting the existence of processing resources that underlie feature identification and feature integration, it is important to discuss one of the major criticisms of MRT: that an infinite number of resources can be postulated, one for every possible task or process imaginable. Wickens (2007) has addressed this criticism by suggesting that all postulated resources have *physiological plausibility*. That is, there should be some anatomical parallel in the brain for all postulated resources. Indeed, physiological plausibility exists for all of the processing resources identified in MRT (Wickens, 2008). For instance, relatively greater activity has been observed in the left middle frontal gyrus during a group level social perceptual task (Mason & Macrae, 2004), and this area shows greater activity during a task that involves processing the differences between individual facial features (Maurer et al., 2007). In addition, relatively greater activity has been observed in the right frontal gyrus during a person-level social perceptual task (Mason & Macrae, 2004), and this area shows greater activity during a task that involves processing the differences between entire configurations of features (Maurer et al., 2007).

The current research examines the extent to which group- and person-level perception depends on the availability of feature identification and feature integration resources, respectively. The availability of feature identification and feature integration resources was manipulated by briefly presenting a to-be-ignored prime face in either the LVF or RVF, just before a centrally presented target face was to be categorised by sex (Experiment 1) or identified as familiar (Experiment 2). We reasoned that, although to-be-ignored, the prime face would nonetheless be processed (Macrae, Bodenhausen, Milne, & Calvini, 1999, Macrae, Quinn, Mason, & Quadflieg, 2005) and would demand feature identification resources when presented in the RVF-LH and feature integration resources when presented in the LVF-RH. Then, if a target face were presented while these resources were allocated, target judgements that depended on these resources would be slowed. Thus, we hypothesised that during the sex categorisation task, a briefly presented prime face in the RVF-LH would utilise available facial feature identification resources and thus delay subsequent target sex categorisations. Similarly, during the person identification task, a briefly presented prime face in the LVF-RH would utilise available facial feature integration resources and thus delay subsequent target person identifications. Justification for the length of time that prime faces needed to be presented and target faces onset in order to *deplete* the resources needed for efficient target processing is provided in the design and procedure of each experiment.

EXPERIMENT 1

Method

Participants. A total of 45 (23 female, 22 male) right-handed students (laterality quotient $M = 0.78$, $SD = 0.24$; Oldfield, 1971) were recruited from Introduction to Psychology courses. Seventy-eight percent were self-reported Mexican-American ($n = 31$) or Mexican-National ($n = 4$). The remaining 22% self-identified as Non-Hispanic White ($n = 7$), or African-American ($n = 3$). Age ranged from 18 to 39 years ($M = 23$ yrs, $SD = 5$) and all participants received partial course credit in exchange for their participation.

Materials. The sex categorisation task was presented using SuperLab 2.0 software (Cedrus Corporation, 2002) and a Cedrus RB-820 response pad.

Participants' heads were kept stable at 53 cm from a computer monitor with the use of a chin rest. Stimuli included 128 head and shoulder colour photos of Mexican-American male (64) and female (64) college students in a full-face pose. Clothing was only visible from the neck up. Each photo was presented as either a stimulus or target and was never presented more than once throughout an experimental session.

Design and procedure. The duration for which prime faces were presented and the point at which target faces were onset was crucial and was based on a combination of findings. First, research suggests that the visual information extracted from faces as early as 45 ms after onset is involved in distinguishing between male and female faces (Mouchetant-Rostaing, Giard, Bentin, Aguera, & Pernier, 2000), so the prime face needed to be presented for less than 45 ms (e.g., 30 ms). Second, priming effects decrease linearly as prime–target stimulus onset asynchrony (SOA) decreases (Forster, Mohan, & Hector, 2003), so the prime–target SOA needed to be as short as possible. Consistent with this reasoning, previous research using a similar SOA manipulation showed that a 32-ms prime–target SOA delayed sex categorisation when primes were presented in the RVF-LH compared to the LVF-RH (Rivera, Arms-Chavez, & Zárate, 2009). Thus, whereas most unilateral priming procedures are intended to facilitate target processing, our intention was to present the prime and target in brief temporal sequence so that the prime would utilise the resources needed for efficient target processing.

Participants completed eight practice trials that consisted of two of each of the four types of task trials. The photos used during the practice trials were not used again during the task trials. Next, participants completed 64 task trials. These consisted of an equal number of male/male (32 trials) and female/female (32 trials) prime–target pairs. Each trial consisted of (a) a 2000-ms blank screen, (b) a 1500-ms central fixation cross, (c) a 30-ms unilateral prime photo, and (d) a 1500-ms central target photo. The centre of each prime photo was presented either 6.5 cm to the left (LVF-RH) or right (RVF-LH) of the central fixation cross. Target photos were always centrally presented and subtended 11° of vertical visual angle and 9° of horizontal visual angle. On average, the face in each photo subtended 10° of vertical visual angle and 8° of horizontal visual angle. Participants were told to focus their attention on the fixation cross and ignore the prime when presented because the prime was intended to distract them. The short prime duration also minimised participants' opportunity to avert their gaze from the central fixation point towards the priming stimuli, reducing the possibility of bilateral prime presentation. Participants categorised target photos by sex as quickly as possible by pressing a response button with either index finger. A go/no-go procedure (White, 1981) was used to reduce response competition. Participants responded only if the target was a female during the first block (32 trials) and only if the target was male during the second block (32 trials). Block order was counterbalanced and participants took approximately 10 minutes to complete both blocks.

Results

Data processing. Response time (RT) data from two participants (one Mexican-American female and one African-American male) were excluded because associated error rates were larger than three standard deviations above the overall mean error rate ($M = 0.04$, $SD = 0.09$). Analyses were conducted on data from the remaining participants ($N = 43$). RT data below 200 ms were excluded from analyses and RT data above three standard deviations from the overall mean RT ($M = 532$, $SD = 121$) were truncated. Analysis of the RT distribution revealed that these data were normally distributed.

Data analysis. Participant sex was excluded from all reported analyses because it did not account for a significant amount of RT variability and it did not interact with any factors. RT data were submitted to a 2 (Visual field: left or right) by 2 (Prime–Target Sex Match: same sex or opposite sex) repeated measures ANOVA. Only the main effect of visual field was significant, $F(1, 42) = 5.05$, $p = .03$, $d = 0.11$. As predicted, targets were responded to slower after priming to the RVF-LH ($M = 539$ ms, $SD = 125$ ms) than after priming to the LVF-RH ($M = 525$ ms, $SD = 120$ ms). Target response times when prime–target pairs were of the same sex ($M = 528$ ms, $SD = 128$ ms) did not differ significantly from response times when prime–target pairs were of the opposite sex ($M = 536$ ms, $SD = 117$ ms). Overall error rates were the same across Visual field and Prime–Target Sex Match (in all four conditions, $M = 0.01$, $SD = 0.01$). In addition, correct hits, correct misses, false hits, and false misses did not differ significantly across visual field of priming. Collectively, this suggests that the observed effect was not due to a speed/accuracy trade-off. Thus the observed hemispheric asymmetry supports the hypothesis that depleting LH resources interferes with subsequent sex categorisation.

Discussion

The goal of Experiment 1 was to investigate how resource depletion within the LH influences group-level social perception. It was hypothesised that face primes presented in the RVF would utilise feature identification resources within the LH and thus interfere with subsequent group-level judgements. This hypothesis was supported via a small but significant effect of visual field of priming on sex categorisation. Brief RVF priming temporarily depleted group-based processing resources in the LH, which resulted in slower target sex categorisations. This finding replicates an effect found in a previous study, using a different set of materials (Rivera et al., 2009).

EXPERIMENT 2

Experiment 2 tests the basic resource depletion hypothesis further by examining processes generally associated with the RH. Research suggests that feature integrative processing resources associated with the RH (Kosslyn et al., 1989) give rise to person-level social perception (Mason & Macrae, 2004; Zárate et al., 2000). The depletion of these resources is expected to interfere with subsequent person-level social perception. Familiar face identification tasks have often been used to examine person-level social perception. We chose to use famous faces as our familiar face stimuli because famous faces are highly familiar faces, and processing differences between famous faces and familiar non-famous faces are not evident during the earliest stages of visual processing (Kloth et al., 2006). Various studies have demonstrated the RH's superiority for the identification of famous faces (Bourne & Hole, 2006; Levine & Koch-Weser, 1982; Young, Hay, McWeeny, Ellis, & Barry, 1986) and a feature integrative process appears to be involved (Tanaka & Farah, 1993). Experiment 2 examined the efficiency of familiar (famous) target identification following the depletion of RH resources. It was hypothesised that briefly presented familiar face primes in the LVF would deplete RH feature integrative resources and thus interfere with the subsequent identification of familiar face targets.

In addition, Experiment 2 examined whether the resource depletion effect was sensitive to differences in the content of the prime photo. Three types of prime photos were included: familiar (famous) faces, unfamiliar faces, and non-facial stimuli. Non-facial stimuli were included to dissociate general visual processing resources from facial processing resources. If any prime produces an interference effect, then one can argue that prime content is irrelevant and new information is processed slower while any visual processing is occurring. If any face produces an interference effect, it would suggest that a depletion of general face processing resources underlies the effect. Finally, if only familiar faces produce the effect, it would suggest that the availability of feature integration resources underlies the effect.

Method

Participants. A total of 46 (35 female, 11 male) right-handed students (laterality quotient $M = 0.69$, $SD = 0.23$; Oldfield, 1971) were recruited from

Introduction to Psychology courses. Eighty-three percent were self-reported Mexican-American ($n = 31$) or Mexican-National ($n = 7$). The remaining 17% self-identified as Asian American ($n = 3$), Non-Hispanic White ($n = 2$), other ethnic group members ($n = 2$), or African-American ($n = 1$). Age ranged from 17 to 24 years ($M = 19$ yrs, $SD = 1$) and all participants received partial course credit in exchange for their participation.

Materials. A total of 92 photos were used. Photos included (a) 88 head and shoulder photos of Latino individuals in full-face pose and (b) 4 photos of non-facial stimuli. The photos of Latino individuals consisted of unfamiliar males (40) and females (40), and familiar males (4) and females (4). By including only eight familiar faces in this experiment and verifying each participant's familiarity with each face (see *Design and procedure*), we ensured that these faces were both episodically and semantically familiar to participants. Unfamiliar males and females were undergraduate college students. Familiar males were Antonio Banderas, Mark Anthony, Benicio Del Toro, and Andy Garcia. The familiar females were Daisy Fuentes, Eva Longoria, Jennifer Lopez, and Salma Hayek. The non-facial stimuli depicted a chair, a tree, an apple, and a lamp.

Design and procedure. A total of 96 task trials were constructed from 92 photos. A task trial consisted of a prime photo that was always presented first and laterally and a target photo that was always presented second and centrally. Each task trial followed a 3 (Prime Type) $\times$ 2 (Target Type) design. The three prime types included familiar (famous) faces, unfamiliar faces, and non-facial stimuli. The two target types included familiar (famous) faces and unfamiliar faces.

Facial task trials were those in which faces primed faces. For all facial task trials, prime sex was always consistent with target sex (i.e., female primes were always paired with female targets and male primes were always paired with male targets). There were a total of 64 facial task trials, which consisted of 16 trials of each of the following prime–target combinations: familiar primes/familiar targets, familiar primes/unfamiliar targets, unfamiliar primes/familiar targets, and unfamiliar primes/unfamiliar targets. Within these 64 trials there were an equal number of male and female prime–target pairs presented in each visual field. Whereas each unfamiliar face was presented only once per experimental session as either a prime or target, each familiar face was presented twice as a prime in each visual field and twice as a target following left and right visual field priming.

Non-facial task trials were those in which non-facial stimuli primed faces. There were a total of 32 non-facial task trials, which consisted of 16 trials of each of the following prime–target combinations: non-facial prime/familiar target, non-facial prime/unfamiliar target. Within these 32 trials there were an equal number of non-facial primes presented in each visual field and an equal number of male and female targets. Each non-facial prime was presented eight times, once with a familiar target of each sex in each visual field and once with a non-familiar target of each sex, in each visual field.

Prior to completing the task trials, each famous photo was initially presented centrally in a sequence of eight orientation trials. Orientation trials allowed participants to practise using the response pad and allowed the experimenter to verify participants' awareness of the fame associated with the individual in each photo. Participants responded to the eight orientation trials by pressing a response key to indicate whether or not they recognised the person in each photo as a famous individual. Each orientation trial consisted of a 2000-ms blank screen followed by a 7-s central presentation of a famous target. Because identity information takes longer to extract from faces than does social categorical information (Cloutier, Mason, & Macrae, 2005), the prime-to-target SOA was lengthened to 80 ms. This SOA was still well below the amount of time required to process the identity of face primes (Bentin & Deouell, 2000; Cooper, Harvey, Lavidor, & Schweinberger, 2007). Thus we reasoned that face primes presented in the LVF-RH for 80 ms would temporarily utilise the hemispheric resources needed for efficient target identification.

Following the orientation trials, participants responded to the task trials by pressing a response key to indicate whether each target photo was famous or non-famous. All task trials were presented in a randomised order. A go/no-go procedure was used so that participants responded (using either index finger) to the first half of the task trials only if the target photo was a famous individual and to the second half of the task trials only if the target photo was a non-famous individual. The order in which participants responded to famous and non-famous target faces was counterbalanced across participants. Each task trial consisted of (a) a 2000-ms blank screen, (b) a 1500 -ms central fixation cross, (c) a 80-ms unilateral prime photo, and (d) a 1500-ms central target photo. Prime photos were presented to each visual field with the centre of each photo either 6.5 cm to the left (LVF-RH) or right (RVF-LH) of the central fixation cross. Target photos were always centrally presented and all facial target photos subtended 11° of vertical visual angle and 9° of horizontal visual angle. On average, the face in each facial target photo subtended 10° of vertical visual angle and 8° of horizontal visual angle. Participants took approximately 20 minutes to complete the experiment.

Results

Data processing. Non-famous target identifications were included in the design to provide task variability, but no predictions were made for non-famous target identifications. Using a similar paradigm, Cooper et al. (2007) found no significant visual field or priming effects for non-famous targets. Thus only the famous target identification data are reported. Incidentally, post-hoc analyses on the non-famous targets did not reveal the same pattern of results that was present for famous targets. RT data from three participants (one Mexican-American male and two Mexican-National females) were excluded because associated error rates were larger than three standard deviations above the overall mean error rate ($M = 0.05$, $SD = 0.08$). RT data from four additional participants (four Mexican-American females and one Mexican-American male) were excluded for failure to recognise at least 6/8 (or 75%) of the famous individuals presented during the orientation trials. Analyses were conducted on data from the remaining participants ($N = 39$). RT data below 200 ms were excluded from analyses and RT data above three standard deviations from the overall mean RT ($M = 548$, $SD = 89$) were truncated. Analysis of the RT distribution revealed that these data were normally distributed.

Data analysis. Participant sex was excluded from all reported analyses because it did not account for a significant amount of RT variability and it did not interact with any factors. RT data were submitted to a 2 (Visual field: left or right) by 3 (Prime Type: familiar, non-familiar, and non-facial) repeated-measures ANOVA. Only the Visual field by Prime Type interaction was significant, $F(2, 76) = 3.61$, $p = .03$. To analyse this interaction effect we conducted three *t*-tests that compared target response times after LVF-RH priming to target response times after RVF-LH priming for each of the three prime types. Target response times did not differ across visual field of priming when primes were non-facial, $p = .69$ or unfamiliar $p = .33$. However, as predicted, target response times after LVF-RH priming ($M = 558$, $SD = 99$) were significantly slower than target response times after RVF-LH priming ($M = 533$, $SD = 95$) when primes were familiar, $t(38) = 2.37$, $p = .02$, $d = 0.26$ (see Table 1). Next we analysed target responses following only LVF-RH priming to examine whether target responses differed as a function of prime type. Target responses after LVF-RH unfamiliar primes did not differ significantly from target responses after LVF-RH non-facial primes, $p = .76$. However, target responses after LVF-RH familiar primes were significantly slower than target responses after LVF-RH unfamiliar primes, $t(38) = 2.23$, $p = .03$ and marginally slower than target responses after LVF-RH non-facial primes, $t(38) = 1.94$, $p = .06$.

Finally, we analysed overall error rates. The overall error rate was $M = 0.05$ after LVF-RH familiar primes and $M = 0.03$ in all other conditions. These error rates did not differ significantly as a function of Visual field, Prime Type, or the combination of these two factors (all ps $> .20$). There were also no significant differences in the percentage of correct hits,

TABLE 1
Mean familiar target response times after left and right visual field priming

	Visual-field of priming	
	Left	*Right*
Familiar (famous) face primes	558 (99)[a,b,c]	533 (95)[a]
Unfamiliar face primes	529 (84)[b]	539 (83)
Non-facial primes	533 (88)[c]	537 (84)

Standard deviations are in parentheses.
[a,b]Significantly different at $p = .05$. [c]Marginally different at $p = .06$.

correct misses, false hits, or false misses as a function of these factors. Collectively, this suggests that the observed effects cannot be attributed to a visual field speed/accuracy trade-off.

Discussion

The goal of Experiment 2 was to investigate how resource depletion within the RH influences person level social perception. It was hypothesised that resource depletion within the RH, via brief LVF priming, would interfere with person level judgements. Prime content was manipulated to examine the nature of the processing resources responsible for the predicted interference. Interference was only observed after familiar face primes were presented in the LVF. Familiar target faces took longer to be identified after familiar prime faces were presented in the left compared to the right visual field. Interference was not observed after unfamiliar faces or non-facial stimuli were presented in the LVF. This finding conceptually mirrors the LH resource-dependent effect found in Experiment 1 (see Figure 1).

GENERAL DISCUSSION

The current research explored the hypothesis that social perception depends on the availability of limited-capacity resources that are distributed across the cerebral hemispheres. Depletion of these resources was predicted to interfere with distinct types of social perception. Results were consistent with predictions. When left hemisphere feature identification resources were engaged by a brief unilaterally presented unfamiliar prime in the RVF (Experiment 1), subsequent group-based judgements that depend on those resources took longer to make. Similarly, when right hemisphere feature integration resources were engaged by a brief unilaterally presented familiar prime in the LVF (Experiment 2), subsequent person-based judgements that depend on those resources took longer to make.

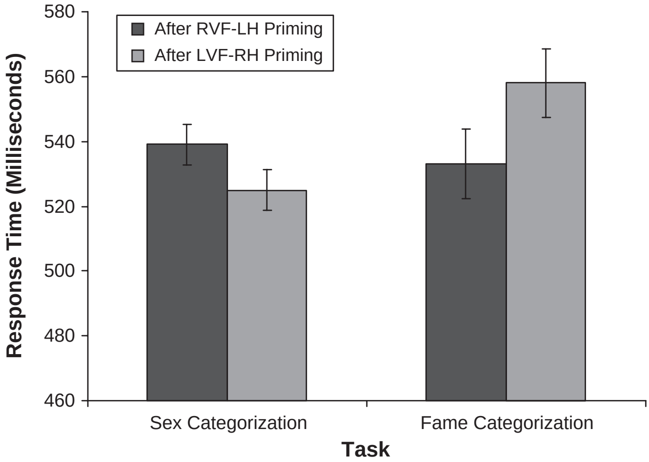

Figure 1. Mean response times for sex categorisation (Experiment 1) and fame categorisation (Experiment 2) following brief visual field priming. The sex categorisation task data shown here represent response times to trials in which unfamiliar prime faces preceded unfamiliar target faces. The fame categorisation task data shown here represent response times to trials in which familiar prime faces preceded familiar target faces. Error bars depict the standard error of the difference between means. Error bars should only be considered within each task, as each task was administered in a separate experiment.

The resource depletion effect observed in each experiment differed with regard to the influence of prime content. The left hemisphere depletion effect (Experiment 1) was not dependent on the content of unilaterally presented primes. Prime content only varied by sex, and the match/mismatch between the sex of the prime and the sex of the target did not significantly influence any result. It thus appears as though the left hemisphere depletion effect is independent of prime content. The sensitivity of left hemisphere resources to prime content might be explored further by examining whether briefly presented familiar faces or non-faces have distinct influences on immediate social judgements. In contrast, the right hemisphere resource depletion effect occurred only after the unilateral presentation of familiar (famous) face primes. Previous research suggests that one's ability to identify a famous face depends, in part, on one's ability to integrate facial features into a specific feature configuration. Thus the availability of feature integration resources, rather than general visual or general facial processing resources, was likely responsible for the right hemisphere depletion effect. This reasoning is in line with Bindemann, Jenkins, and Burton's (2007) proposal that the extraction of familiar facial information consumes limited-capacity processing resources that are not used by other types of stimuli and that are in short supply in comparison to those utilised by early visual processes. Moreover, the fact that only familiar face primes produced interference suggests that attentional distraction alone was not responsible for the observed effect (see Rutherford & Lutz, 2004). If any prime had produced interference, then these results could have been attributed to the distraction of the RH by LVF primes. But because the interference was specific to familiar face primes, we prefer a resource-based interpretation of the data.

More generally, the current research suggests the need to differentiate between task stimuli according to the specific processing resources that they engage. Within any given task, task stimuli engage specific processing resources. The specific processing resources that task stimuli engage will depend on, among other things, the overlap between task stimulus properties and task demands or goals. The more overlap there is between the two, the more engaged specific processing resources will be over others. For instance, within the face identification task in Experiment 2, an interference effect was observed when there was high overlap between task stimuli (familiar primes) and task demands (identify familiarity). We presume that this overlap encouraged the engagement of certain processing resources over others, namely the engagement of feature-integrative processing resources over more general face-processing resources. All of this suggests that all primes are not created equal and that it is important to be aware of the distinct resources that any given prime engages as a function of task demands.

Finally, the current research extends multiple resource theory (Boles & Law, 1998; Wickens, 1992, 2002) to social perception. MRT has generally been used to predict when resource depletion will lead to task interference. Yet MRT has almost exclusively been used to predict interference between non-social tasks (Wickens, 2002). The current findings extend MRT to allow one to predict interference between two tasks involving social perception. Social perceptual tasks that simultaneously demand either feature identification or feature integration resources in the left and right hemispheres are predicted to interfere with one another. As has been done with non-social information processing (Boles, 1992, 1998; Boles & Law, 1998), factor-analytic methods could be used to further dissociate the hemispheric resources involved in distinct social perceptual tasks.

Multiple factors influence our perception of others. The evidence presented here suggests that our perception of others at the group and person level is influenced by the availability of processing resources in the left and right hemispheres, respectively. Using a multiple resource approach, one can further investigate the component processes that underlie our perception of others.

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