Switching Association to Mother can disrupt Gains and Loss patterns from Self-preference

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1 Introduction

A preferential bias for self-referential processing has been found to be pervasive, resulting in prioritized responses to stimuli like own-name, face, attributes and even unrelated neutral perceptual stimuli like geometric shapes (as used in Sui, He and Humphreys 2012). It implies that the salience of 'self' enhances stronger associations than with 'other' and thereby supporting enhanced RTs to match any stimuli conforming to new self-association. It is however conversely, in cases when self-associated stimuli are instructed to be ignored, that the preferential saliences of such association have been observed to induce noticeable processing costs (own faces and names distracting attention away from task targets- Brédart, Delchambre, and Laureys 2006 etc.). Wang, Humphreys and Sui (2016) interestingly studied what would happen when an original pairing of particular neutral exemplars (geometric shapes, say triangle) with a more salient social label (say, 'self') is reassigned to a newer label ('friend' or 'stranger'), thereby also associating another alternative shape (say, a square) with 'self' itself. While the reassigned new self-associations continued to enjoy faster responses than others, the study found a greater cost, in terms of a significant reduction in accuracy and slower reaction times, when the former salient congruent associations (eg. 'self' shown with 'triangle') had to be discarded as mismatches, post switching. This has been explained by the hypothesis that associating stimuli with self facilitates a stronger memorial glue compared with others, thus not only fostering faster RTs to newer self match-associations, but the stronger binding also consequentially makes the breaking away from formerly salient social associations be harder, thereby incurring less efficient responses.

It is in this context that studies on such perceptual prioritization that have been examined with alternate salient associations, like that in close others (eg. mother) become interesting. Research on Indian sample (Verma, Jain & Srinivasan 2021) has observed how, unlike friend-association, mother-salient information can be processed even as well as self's, further

indicating how salient categorical contexts of relative social associations dynamically influence cognitive processing. It is thus in our experiment, we aimed to test what contextual differences would be induced in the processing advantages and switching costs from forming new and breaking old associations upon reassigning the social labels across two experiments when apart from the friend label (as used by Wang et al.,2016), the label-switching is now also modulated with the ‘mother’ label. We aimed to assess, through simple shape–label perceptual match task (as of Sui et al 2012), if the strength of a more salient label (i.e. ‘mother’ vs ‘friend’) and the nature of switching (as modulated by Expt 1-Expt 2; described later), disrupts the gains and costs patterns as induced for self-salience.

2 Methods

In both experiments, first, an initial associative learning task made participants associate geometric shapes (a square, a circle, a triangle) with counterbalanced social labels (‘you’/‘friend’/‘stranger’) and then perform a shape-association judgement task. Following six consecutive correct recognitions of a presented shape's association, participants were asked to relearn new associations with the shape-labels pairings switched. In Experiment 1, the previously self-associated shape was assigned to ‘stranger’, mother-associated to 'you', stranger-associated to 'mother'. In Experiment 2, the self-associated was switched to ‘mother’, mother-associated to 'stranger', stranger-associated to 'you'. Then they performed another match-recognition task assessing whether the presented congruent-incongruent shape–label pair matched switched reassociations or not. Thus, in mismatched (incongruent) trials in Experiment 1, the previously self-associated shape got paired with the 'you' /'mother' label under the new instruction while in mismatch trials of Experiment 2, the previously associated self-shapes were now paired with 'you'/'stranger' labels in the mismatched trial. Likewise, combinations followed for other shape-associations as well. In essence, one thus also had to judge the shape-label combinations that were firstly instructed to be congruently associated matches to now be responded as incongruent/non-match combinations under switched reassociation. One could expect that under these breaking association conditions there will be greater cost and disruption of performance in certain mismatch conditions due to stronger associative glue to certain previously-associated labels. Additionally, we also studied similar tests using the ‘friend’ label (in place of 'mother') as a confirmatory parallel to Wang et al., 2016.

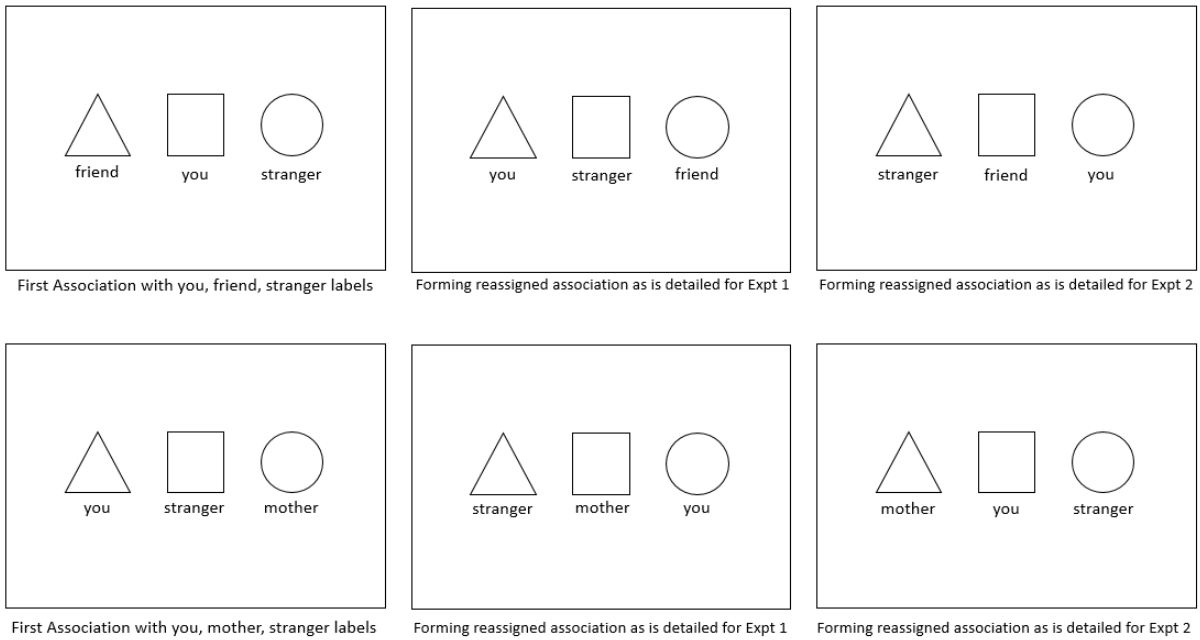


Figure: Label-reassignment in Expt 1 and 2 for friend (following Wang et al 2016) and mother label along with self and stranger

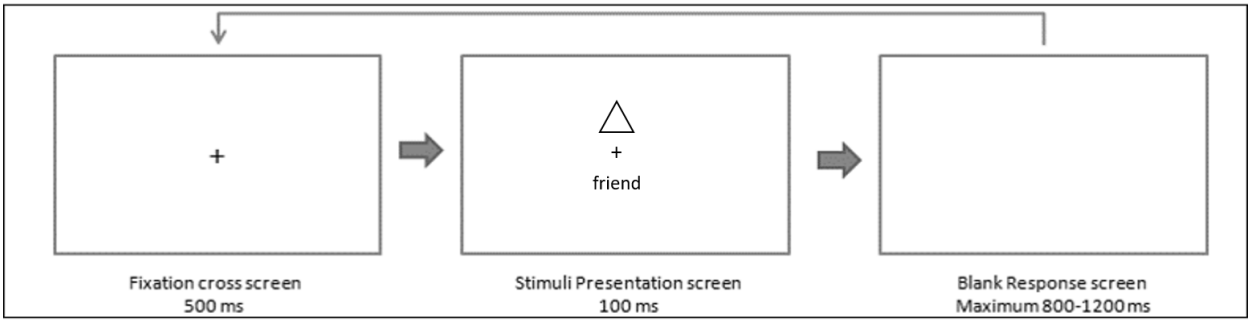


Figure: Flow of the final perceptual judgement task

3 Results

Our results in the confirmatory test with friend-label were very similar to that reported in Wang et al 2016. Newer self-associations indeed enjoyed faster processing, and former self-associations were harder to break away from in giving mismatched responses, than with labels, upon switching of associations in the two reassignment conditions.

However, it is our results with the 'mother' label for close-other that were most novel and interesting. Repeated measures ANOVAs on responses in the first shape-associations judgement task with category (self, mother, stranger) as factor showed a significant effect on RTs, F=5.692, p=0.006, with the lowest RTs for self (400 ms), significantly faster than mother ($p_{holm=}$=0.011), as well as a just significant effect on accuracy F(2,44)=3.662, p=0.032.

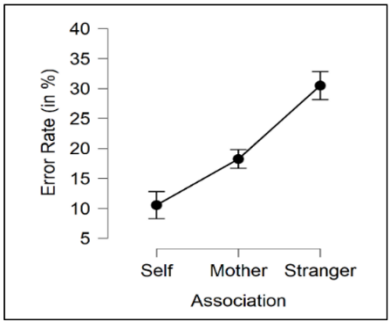
Upon the new reassignment of labels in Experiment-1, response patterns were similar to previous findings with new self-matches being responded significantly faster (p_{holm}<0.001 and p_{holm}<0.001) and more accurately (p_{holm}=0.012 and p_{holm}<0.001 respectively) than mother or stranger; mother-responses were faster than stranger's p_{holm}<0.001).

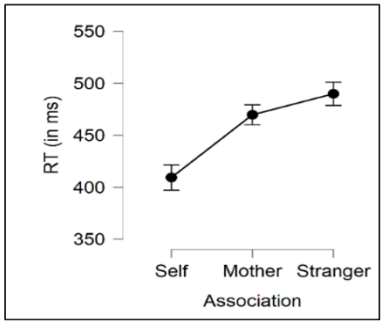
However, in stark contrast, upon switches-label reassignment in Experiment 2, no faster responses or fewer errors persisted, even in the matched-response cases, for the new self-associated stimuli than either mother or stranger stimuli.

In the mismatched trials of both experiments, wherein one had to explicitly break their associations from the first task, the trials were sorted as per their initial label associations. There was a significant effect of shape-category on RT for mismatch trials in Experiment 1, F(2,44)=20.918, p<0.001 with slower mismatch responses to former self-associations than mother (p_{holm}<0.001) but faster than strangers (p=0.012) while the latter two were also significantly different (p_{holm}<0.001). There was a significant effect on Expt-1 accuracy as well, F(2,44)=6.895, p=0.003 and more erroneous reactions to former self mismatches than mother (p_{holm}=0.007), and mother responses had significantly lesser error than stranger unmatches (p_{holm}=0.005).

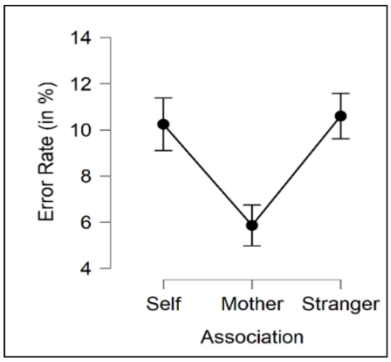
The response patterns to mismatch-trial responses in Experiment 2 were, however, starkly different again. Even though there was a trend of self-mismatch incurring greater RT, the effect of association on mismatch RTs or pairwise comparisons in the factor variables in this second reassignment condition was not significant. There was also no significant effect on the mismatch accuracies, even though a trend towards lesser accurate responses for self compared to mother (p_{holm}=0.13) and stranger (p_{holm}=0.10) was clearly reflected.

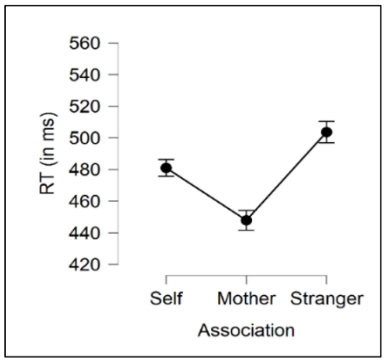
Forming Second Association with Self, Mother, Stranger matches in Experiment 1



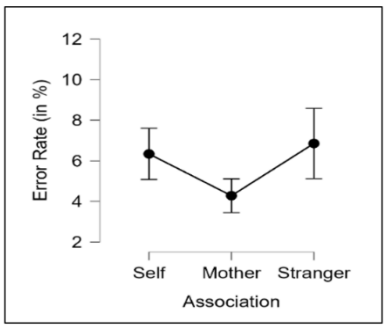


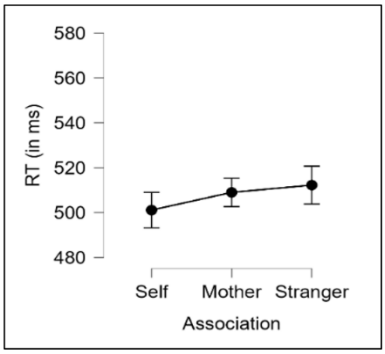
Breaking First Association with Self, Mother, Stranger mismatches in Experiment 1



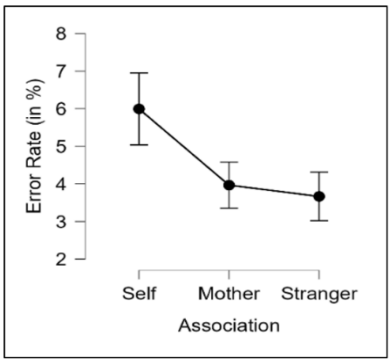


Forming Second Association with Self, Mother, Stranger matches in Experiment 2





Breaking First Association with Self, Mother, Stranger mismatches in Experiment 2



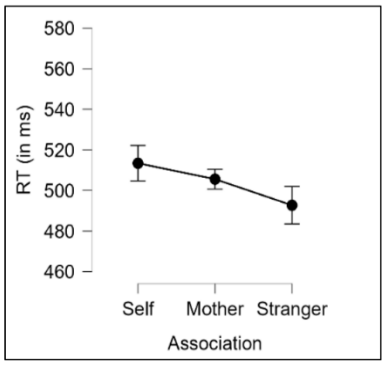


Figure: The differences in RT and error rates in Expt 1 and Expt 2

4 Discussion

Our study does provide evidence that support how self-reference effect enhances the binding of associations in memory, thus not only enabling prioritized processing towards reassigned self-match responses, but also inducing more difficulty in breaking-away (mismatch responses) from former-self-associations, as found with switching self-friend-stranger shape-label pairings, following Wang et al 2016. But far more importantly, our results with label-switching with 'mother' (instead of 'friend') indicated how dynamic expansion or retraction of socioperceptual prioritization (self vs others) is probably still context-dependent than grossly overgeneralisable. We found that prioritized responses to new self-matches and more difficult mismatch responses to former self-association persisted in Experiment-1 when self was reassigned to stranger, mother to self, stranger to mother while no such significant pattern persisted in Experiment-2 (even though indicated some trends) where self was reassigned to mother, mother to stranger, stranger to self-associations. This pointed towards how it is important to appreciate the actual nature of the newly-formed associations (through differing mode of switching), and the varying degree of social salience of the relative social categories (mother being more strongly salient than friend, Verma et al., 2021) in our quest for understanding consequences of prioritized binding of certain social information in memory or otherwise. The situational circumstances may lead to differing gains and costs of interference due the involved presence of such intertwined close others in perceptual processing, modulating the very nature of social-preference for self.

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