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Last but not least

Eye-witnesses should not do cryptic crosswords prior to identity parades

Abstract. Navon letter tasks have been shown to affect subsequent face recognition performance. As such tasks are not likely to by carried out prior to a witness attending an identity parade this is unlikely to have much applied relevance. Here, however, it is explored how a range of puzzles that witnesses might engage in affect face recognition. Cryptic crosswords were found to have a detrimental effect on subsequent face recognition, unlike reading, literal crosswords, or sudoku. As well as this finding's practical importance, it also provides a further insight into the Navon effect on face processing.

The identification of an offender by a witness to a crime often forms an important element of a prosecution's case. While considerable importance is placed by jurors on the identification of the offender by a witness (such as a suspect being picked out from an identity parade), research tells us that these identifications can often be wrong and sometimes lead to wrongful convictions (eg Rattner 1988). Exploration of factors that improve or produce a detriment in our abilities to pick out correctly a person from an identity parade is of obvious utility.

It has been shown that face-recognition performance in an eye-witness-like situation can be influenced by a task immediately preceding the recognition test. Schooler and Engstler-Schooler (1990) demonstrated that describing a face can make a face-recognition task harder, but it has also been shown that describing an unrelated object, such as a car, has a similar effect (Brown and Lloyd-Jones 2003). Macrae and Lewis (2002) and Perfect (2003) have demonstrated that processing Navon stimuli has a profound effect on subsequent face recognition. Navon stimuli are large letters formed from repeating a single small letter. Such a stimulus can be seen as consisting of a global element (the large letter) and local elements (the small letters). If participants read out the large letters of these stimuli, then subsequent face recognition performance was found to be better than controls, but if the participants read out the smaller letters of the same stimuli they did worse than the controls. A similar effect has been found when using Navon shapes rather than letters (eg a large circle made up of small squares—Hills and Lewis, in press).

It has been suggested that these two effects described above are similar in their mechanism (Macrae and Lewis 2002). One proposed mechanism is that the tasks detrimental to face recognition (verbal description or the local-letter task) lead to a shift in the way in which faces are processed from a configural manner to a featural manner (eg Schooler 2002). This shift leads to the observed poorer performance.

One possible practical application for these findings is that it may be possible to improve a witness's performance in an identity parade by using a simple task before the line up. This possibility, however, assumes that the gain observed between the global-letter task and the control is due to improved performance after the global Navon stimuli rather than a detriment after the control task (which is often a reading task). Consequently, it may be difficult to improve default face-processing ability; however, it appears that there are a number of ways that we can make it worse.

Obviously, within a forensic situation it would be undesirable to have witnesses doing something before an identity parade that would make them worse at picking out the offender. Thankfully, it is very unlikely that witnesses encounter Navon stimuli just before an identity parade and even more unlikely that they will read the local letters of those stimuli if they do encounter them.

One can, however, consider what witnesses may do before an identity parade. It is possible that they might be doing something to pass the time (eg read or do a puzzle). It is possible that some of these potential activities may lead to a detriment in face processing similar to that observed in the local processing of the Navon task. Whether or not an activity is likely to affect subsequent face processing is a question best answered empirically. To this end, an experiment was run to test how face processing is influenced by a range of common activities. Similarities between the local Navon task and verbal descriptions are difficult to identify and so it was not possible to identify a priori predictions.

The tasks tested within the experiment presented here were: reading a passage from Dan Brown's 'Da Vinci Code';[1] solving a sudoku puzzle; solving a literal crossword; solving a cryptic crossword. The text was chosen because it is one of the most widely read novels at the moment. Sudoku puzzles are popular at the moment and involve filling in an incomplete matrix of digits according to criteria. Such problems have a mix of local features (digits) and global features (the matrix). A literal crossword is a task where words must be filled within a grid where the clues to these words are literal definitions. Cryptic crosswords use a similar grid but the clues involve double meanings and sometimes involve anagrams or uncommon ways of thinking about words. None of the participants completed his/her task in the time allowed during the experiment.

Sixty participants (Cardiff University undergraduates) saw 14 faces for 3 seconds each presented sequentially. They then engaged in their puzzle or read the passage for 5 minutes after which they began a face memory task with the 14 target faces (slightly different images than those learnt) and 14 distractors. Between each test item, however, participants continued with their puzzle or read the text for 30 seconds. This methodology has been used in experiments exploring the Navon effect on face recognition where the Navon task was interleaved with the face-recognition task to re-instate the original manipulation (Hills and Lewis, submitted). Performance on the face-recognition task was assessed and measured in terms of discrimination score or d' (Macmillan and Creelman 1991).

The results are displayed in figure 1. The performance of the participants in the reading condition, the sudoku condition, and the literal crossword condition were all roughly equivalent. Performance in the cryptic crossword condition was considerably poorer than in the other conditions. A one-way between-participants ANOVA on the data showed a significant condition effect ($F_{3,56} = 3.620$, MSE $= 1.701$, $p < 0.02$, power $= 0.770$). Bonferroni/Dunn a posteriori tests (critical value $p < 0.0083$) showed that there were significant differences between the cryptic crossword condition and the sudoku condition ($p = 0.0070$), and between the cryptic crossword condition and the literal crossword condition ($p = 0.0055$).

The practical implication of this research is, as the title suggests, that eye-witnesses should not do cryptic crosswords before an identity parade. While this finding is of some practical worth, the results also add to our understanding of how faces are recognised and what prior tasks can have carry-over effects into a face-recognition task.

The current study has identified that, as well as providing a verbal description or reading local letters of a Navon letter, doing a cryptic crossword leads to a detriment in face processing. Further, sudoku, literal crosswords, and reading do not have the same effect. Considering what these three disparate tasks have in common may provide a further insight into why and how each of them leads to a detriment in face-recognition ability.

[1] The reading condition is often referred to as a control condition but this is not done here as we are interested in the effect that reading may have, relative to other tasks, on the face-recognition task.

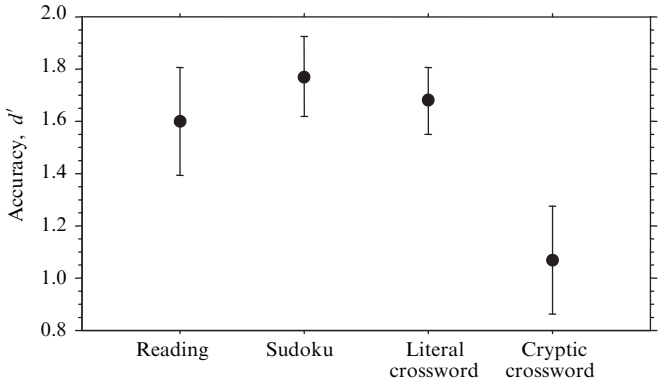

Figure 1. Accuracy scores for the face-recognition task split according to the task performed immediately before. Cryptic crosswords show a detrimental effect on face recognition. Error bars show ±1 standard error.

One speculative observation is that all three tasks, which have been shown to reduce face-recognition accuracy, contain within them an element of suppression or inhibition. When first describing a face (or a car), one can list the obvious features but over 5 minutes (the usual length of time for this task) one must suppress the obvious features in search of new descriptive elements. In reading the local element of the Navon stimuli, one has to suppress or inhibit the global element. Perfect (2006) has suggested that the global Navon task requires less suppression than the local Navon task when the tasks are used in their typical form. Finally, in doing a cryptic crossword, one typically has to suppress the immediately obvious meaning of a word within the clue in favour of less obvious and more cryptic meanings. The suppression of the obvious features of the face, the obvious global letter, or the obvious literal meaning of a word may provide the device by which face-recognition performance is affected. This observation, however, does not explain how such suppression has such a detrimental effect on face recognition. That is, the question of what the mechanism is by which any of these tasks influences the supposedly modular face-recognition system is not addressed here but the experiment reported here does widen the range of tasks known to have an effect.

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References

Brown C, Lloyd-Jones T J, 2003 "Verbal overshadowing of multiple face and car recognition: effects of within- versus across-category verbal descriptions" *Applied Cognitive Psychology* **17** 183 – 201

Hills P J, Lewis M B, in press "Testing alternatives to Navon letters to induce transfer-inappropriate processing shift in face recognition" *European Journal of Cognitive Psychology*

Hills P J, Lewis M B, submitted "Investigating the Navon effect on face recognition"

Macmillan N A, Creelman C D, 1991 *Detection Theory: A User's Guide* (Cambridge: Cambridge University Press)

Macrae C N, Lewis H L, 2002 "Do I know you?: Processing orientation and face recognition" *Psychological Science* **13** 194 – 196

Perfect T J, 2003 "Local processing bias impairs line-up performance" *Psychological Report* **93** 393 – 394

Perfect T J, 2006 "What causes the Navon processing bias effect in face recognition?", paper presented at the BPS Symposium on Verbalising Face Memories, University of Leeds

Rattner A, 1988 "Convicted but innocent: wrongful conviction and the criminal justice system" *Law and Human Behavior* **12** 283 – 293

Schooler J W, 2002 "Verbalization produces a transfer inappropriate processing shift" *Applied Cognitive Psychology* **16** 989 – 979

Schooler J W, Engstler-Schooler T Y, 1990 "Verbal overshadowing of visual memories: Some things are better left unsaid" *Cognitive Psychology* **22** 36 – 71

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