KPU Registry ID Number: 1046 **Date submitted: 23rd May 2018**

Study Registration for the KPU Study Registry

https://koestlerunit.wordpress.com/study-registry/

The registration information for the study is given below. Each section can be expanded as needed.

1. The title or name of the experiment (for listing the experiment in the registry).

An implicit and explicit assessment of morphic resonance theory using Chinese characters.

2. The name, affiliation, and email address for the lead experimenter(s) for the study.

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3. A short description or abstract of the purpose and design of the experiment.

According to Sheldrake (1992) learning new information or making new associations is not only influenced by the formation of memory representations contained in the brain of the individual, but also by a sort of intra-species record of such events, which he refers to as a morphogenetic (or morphic) field. This morphic field is thought to be influenced by, and in turn influences, the species members through a process he refers to as formative causation. The idea that individuals from a particular species may contribute to and can draw from a collective memory leads to some directly testable predictions. For instance, if animals learn a new skill in a specific setting later animals from the same species should in theory be able to learn the same new skill more quickly and/or more accurately as they should be able to draw upon information from the morphic field. Indeed there is research based on animal studies suggesting evidence for formative causation, based on the conditioned aversion of chicks to peck a stimulus (Sheldrake, 1992).

In addition, people should be able to learn more easily what others have already learned and this may be influenced by the number of people. That is, it should become easier to learn something

that a large number of people have already learned. Support for this idea has come from research assessing how quickly individuals could learn Morse code (Mahlberg, 1987) and more recently Chinese characters (Robbins & Roe, 2010). However, an attempt to replicate the effect of improved recognition memory for Chinese characters failed to show any clear beneficial effects (Roe & Hitchman, 2011).

One possible reason for such disparate findings is that the tests used to elicit such effects are predominantly reliant on explicit memory processes (see e.g., Roediger, Buckner, & McDermott, 1999) and have been classified as 'slow-thinking' protocols (Bem, Tressoldi, Rabeyron, & Duggan, 2015). The idea here is that a *slow-thinking* protocol could allow more time for unhelpful conscious cognitive processes to interfere and/or inhibit psi based effects and as such 'fast-thinking' implicit type protocols should be able to elicit a more robust effect (Bem et al., 2015). However, it should be noted that the distinction between slow and fast thinking protocols put forward by Bem et al. (2015) is somewhat arbitrary and is also confounded with the distinction between tasks that rely on explicit compared to implicit processing.

Hence, in an effort to try and tease apart the possible influence of these processes the current study aims to examine people's ability to identify Chinese characters using both an implicit preference task and an explicit identification task that could both be classified as 'fast' due to the emphasis on responding as quickly and as accurately as possible. Based on the theory of formative causation the expectation is that people should implicitly *prefer* real Chinese characters compared to decoy characters. Furthermore, they should be able to explicitly identify *real* Chinese characters more accurately than would be expected by chance alone.

Finally, based on the findings of Bem et al. (2015) which suggest that allowing explicit conscious cognitive processes may interfere and/or inhibit psi based effects the expectation is that the effect of morphic resonance may be greater for the implicit preference task compared to the explicit identification task.

Materials

The experiment will utilise Qualtrics software and a standard keyboard for entering responses. An initial 'Screening questionnaire' will be presented which asks the following five 'Yes/No' type questions:

1. I have studied Mandarin Chinese
2. I know how to write my name in Chinese characters
3. I have visited mainland China
4. I have visited an area in which Mandarin Chinese is widely spoken
5. I know the meaning of 5 or more Chinese characters

The Anomalous Experience Inventory (Gallagher, Kumar, & Pekala, 1994) will be used to assess participants' belief in anomalous events using the three main scales of 'experience', 'belief' and 'ability'.

The stimuli are 24 pairs of Chinese characters which consists of 24 real Chinese characters and 24 decoy (i.e., false) Chinese characters, with each pair (i.e., real vs decoy) matched in terms of number of strokes and complexity (see, Roe & Hitchman, 2011). Two primary lists (List 1 and List 2), which were matched for mean number of strokes and complexity were created. Then, the left/right positions of the Chinese characters within each of these primary lists were counterbalanced creating a further two lists (i.e., List 1a, List 1b, List 2a and List 2b).

An 'attention check' question will be used to ask whether participants left their PC and/or switched applications during the study. Finally, two 5 point Likert-type scale questions will be presented. The first asks how motivated they were to complete the task (on a scale from 1=unmotivated to 5=very motivated). The second asks how pleasant they found the task (on a scale from 1=unpleasant to 5=very pleasant).

Design

This is a within participants design with order of the implicit/explicit task and list fully counterbalanced, see Table 1 below.

Table 1. Showing number of list configurations as a result of counterbalancing of the task type (Implicit vs Explicit) and list.

First Task	**Second Task**
Implicit – List 1a	Explicit – List 2a
Implicit – List 1a	Explicit – List 2b
Implicit – List 1b	Explicit – List 2a
Implicit – List 1b	Explicit – List 2b
Implicit – List 2a	Explicit – List 1a
Implicit – List 2a	Explicit – List 1b

Implicit – List 2b	Explicit – List 1a
Implicit – List 2b	Explicit – List 1b
Explicit – List 2a	Implicit – List 1a
Explicit – List 2b	Implicit – List 1a
Explicit – List 2a	Implicit – List 1b
Explicit – List 2b	Implicit – List 1b
Explicit – List 1a	Implicit – List 2a
Explicit – List 1b	Implicit – List 2a
Explicit – List 1a	Implicit – List 2b
Explicit – List 1b	Implicit – List 2b

The study consists of five phases. First, there will be an *informed consent and screening* phase, followed by an *information capture* phase during which demographics and psi belief levels will be captured. This will be followed by either the implicit task or the explicit task (see Table 1).

The *implicit preference* task contains 2 phases. An initial *relaxation induction* phase followed by the *preference selection* phase. During the relaxation induction participants will be shown an image of a star field and listen to relaxing new-age type music for 1-minute. In the preference selection phase participants will be randomly presented with 12 pairs of characters side by side on the screen. Their task is simply to identify, by clicking on the option below one of the characters, which character they 'prefer'. Emphasis will be given on responding as quickly and as accurately as possible relying on unconscious preferences rather than any explicit processes. This process will then be repeated for the remaining 11 pairs of characters. The dependent measure will be the *number* of times the participant prefers the real character. The expectation is that participants will *prefer* real Chinese characters significantly more than chance (i.e., 50%).

The *explicit identification* task also contains 2 phases. An initial *relaxation induction* followed by the *identification* phase. During the relaxation induction participants will be shown an image of a star field and listen to relaxing new-age type music for 1 minute. In the identification phase participants will be randomly presented with 12 pairs of characters side by side on the screen. Their task is simply to identify, by clicking on the option below one of the characters, which character they think is the 'real' Chinese character. Emphasis will be given on responding as quickly and as accurately as possible. This process will then be repeated for the remaining 11 pairs of characters. The dependent measure will be the *accuracy* of the participant's response. The

expectation is that participants will *identify* real Chinese characters significantly more than chance (i.e., 50%).

Finally, participants will complete an attention check phase asking them whether they left their PC and/or switched applications during the study, how motivated they were to complete the task (on a scale from 1=unmotivated to 5=very motivated), how pleasant they found the task (on a scale from 1=unpleasant to 5=very pleasant) and also be given debrief information relating to the aim of the study along with additional contact information.

4. A statement or list of the specific hypothesis or hypotheses being tested, and whether each hypothesis is confirmatory or exploratory. (confirm/explore guidance)

Confirmatory hypothesis for the implicit preference task

1. Participants will prefer (i.e., select) real Chinese characters at a level significantly greater than chance (i.e., 50%).

Confirmatory hypotheses for the explicit identification task

2. Participants will identify real Chinese characters at a level significantly higher than chance (i.e., 50%).

Exploratory hypotheses

1. The effect size for the implicit preference task may be greater than that of explicit identification task
2. Performance on either/both implicit/explicit tasks may positively correlate with belief in psi
3. Paranormal belief may be associated with participant demographics (e.g., age, gender)

5. The planned number of participants and the number of trials per participant.

The plan is to recruit an opportunity sample of 160 participants, to complete all aspects of both the implicit preference task and the explicit identification task which will be completed on-line.

Each participant will complete a total of 24 trials. This will consist of 12 trials for the implicit preference task and 12 trials for the explicit identification task.

6. A statement that the registration is submitted prior to testing the first participant, or indicating the number of participants tested when the registration (or revision to the registration) was submitted.

This study has yet to be started.

The following additional information is needed for studies that include confirmatory analyses:

7. Specification of all analysis decisions that could affect the confirmatory results, including: the specific statistical test for each confirmatory hypothesis, whether the test is one-sided or two-sided, the criterion for acceptable evidence, any transformations or adjustments to the data, any criteria for excluding or deleting data, and any corrections for multiple analyses. Checklists and examples for registering classical analyses, permutation and bootstrap analyses, Bayesian analyses, and classification analyses are provided in the statistics registration document. **(This information can be included in section 4 above for simple experiments.)**

For both the implicit preference task and the explicit identification task the two dependent measures will be recorded directly by the on-line software (Qualtrics).

Analysis for confirmatory hypothesis 1 will be conducted using a one sample t test comparing number of real characters preferred (i.e., selected) compared to chance (i.e., 50%).

Analysis for confirmatory hypothesis 2 will be conducted using a one sample t test comparing the number of reach characters selected compared with chance (i.e., 50%).

Analysis of exploratory hypothesis 1 will be conducted with a repeated measures t test comparing the mean effect size elicited by the implicit preference task to the mean effect size elicited by the explicit identification task.

Analysis of exploratory hypotheses 2 will be conducted by correlating performance on both the implicit and explicit tasks with participants reported levels of belief in paranormal using the AEI.

Analysis of exploratory hypotheses 3 will be conducted by correlating demographic data (e.g., age, gender) with participants reported levels of belief in paranormal using the AEI.

All statistical tests will be 2-tailed to allow for the possibility that post-recall repetition of the images *could* impair recall performance (see, Ritchie et al., 2012) and utilise a p value of 0.05, including 95% confidence intervals and Cohen's effect sizes.

Finally, only data from participants that answer 'No' to all 5 of the screening questions, and that fully complete all phases of both tasks as well as the post task attention check will be included in the main analysis. However, data from those who fail to complete either task will be clearly summarised.

8. The power analysis or other justification for the number of participants and trials.

The effect size reported by Robbins and Roe (2010) was 0.41. However, this represents an estimation and as such it may be over estimating the potential effect size. Hence, we will adopt a slightly more conservative approach and utilise an effect size of 0.3, which Cohen (1988) identified as small (i.e., from 0.1 – 0.3), to ensure adequate power in the current study.

Adopting the standard alpha criterion of 0.05 (two-tailed), coupled with a test that has the statistical power of 0.95, the required sample size can be calculated using Howell's (1996) sample calculation of:

$$N = \left[\frac{\delta}{d} \right]^2$$

where power of 0.95 as a function of significance at 0.05 (two-tailed) translates into a δ score of 3.60 (Appendix Power Tables from Howell, 1996). Hence, $N = (3.60/0.3)^2$ gives: 12^2 which equals 144, rounded up to ensure an even number of participants viewing each of the list configurations means that we will aim to recruit and test an opportunity sample 160 participants.

9. The methods for randomization in the experiment.

Once participants access the initial welcome screen the Qualtrics software will pseudo-randomly allocate them to one of the four pathways, using an inbuilt Mersenne Twister pseudorandom number generator (PRNG), with the proviso that the PRNG evenly select the four pathways. The PRNG uses the Unix timestamp, counted in milliseconds, as the seed for the random number generator.

10. A detailed description of the experimental procedure.

Participants will be opportunity sampled from those that respond to an on-line call to take part in an on-line study exploring the aesthetics of language. Once participants click the call 'link' they will be taken to the study.

The study will then begin by presenting an information-screening page informing the participant they are about to take part in a study that examines the '*Aesthetics of Language'*. No mention will

be made at the outset that this study is in fact examining possible morphogenetic effects. However, this will be clearly explained in the debrief at the end. The information page will explicitly state that only those with no knowledge and/or understanding of Chinese characters should take part. There will be 5 screening questions that will be used to assess this.

Once participants have read the information and completed the screening questions and provided informed consent they will progress to the information capture page and enter demographic information and complete the selected sub-scales from the Anomalous Experiences Inventory (Gallagher et al., 1994). Participants will then complete both the implicit preference task and the explicit identification task (with order counterbalanced across participants).

Completion of the implicit preference task will begin with participants being shown an image of a starfield along with some relaxing new-age type music for 1 minute with a verbal prompt to encourage them to relax. This will be followed by a relaxation manipulation check which asks participants to rate on a scale from 1 (completely tense) to 10 (completely relaxed) how they feel at that moment in time. Once completed the computer will then present all 12 pairs of Chinese characters from one of the lists in a random sequence. Each trial pair of characters will be presented on screen and remain on screen until participants select the one they 'prefer' by clicking on the relevant point below their chosen character. Once all 12 pairs of characters have been shown participants will proceed onto the next phase, which in this instance is the explicit identification phase (counterbalanced across participants).

Completion of the explicit identification task will begin with participants being shown an image of a starfield along with some relaxing new-age type music for 1 minute with a verbal prompt to encourage them to relax. This will be followed by a relaxation manipulation check which asks participants to rate on a scale from 1 (completely tense) to 10 (completely relaxed) how they feel at that moment in time. Once completed the computer will then present all 12 pairs of Chinese characters from one of the lists in a random sequence. Each trial pair of characters will be presented on screen and remain on screen until participants select the one they think is the 'real' one by clicking on the relevant point below their chosen character. Once all 12 pairs of characters have been shown participants will proceed onto the next phase, which in this instance is the explicit identification phase (counterbalanced across participants).

Once the second task has been completed participants will then complete an attention check task followed by two Likert type questions relating to motivation and pleasantness. The attention check task will ask them if at any time during the study they shifted screens to check emails, looked away from their PC, and/or were distracted by something else going on around them. The Likert-type questions will ask how motivated they were to complete the task (on a scale from 1=unmotivated to 5=very motivated), and how pleasant they found the task (on a scale from 1=unpleasant to 5=very pleasant).

Finally, participants will be shown an information/debrief screen fully explaining the rationale and aims of the study and containing contact details of the Principal Investigator (PI) should they wish to obtain more information.

References

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