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Summary of Results for KPU Study Registry

Measuring precognitive effects using a fast implicit and fast explicit task

(KPU Ref #1036)

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Participants

The plan was to recruit an opportunity sample of 159 participants, to complete all aspects of both the implicit preference task and the explicit recognition task. Unfortunately, due to a technical failure in one of the computers, data relating to the implicit preference task was lost from 47 participants. Alongside this data relating to the explicit recognition task from 5 participants was also lost due to a technical failure. Hence, additional participants were run to fill these missing slots. In total 166 participants completed the implicit preference task (20 Male and 145 Female, with 1 failing to provide information on gender), aged 18y to 48y (M:20.8y SD: 4.8y). One hundred and fifty nine participants completed the explicit recognition task (21 Male and 137 Female, with 1 failing to provide information on gender), aged 18y to 46y (M:20.9y SD: 4.3y).

RESULTS

Response time data was initially cleaned by removing any outliers using a low cut-off of 200ms or above 2.5 Sd from the mean, in a non-recursive manner (see Van Selst & Jolicoeur, 1994). For response times and accuracy, the parametric assumption of normality was checked using both the Shapiro-Wilk test and values of skewness and kurtosis (e.g., DeCarlo 1997; Field, 2013; Razali & Wah, 2011). Data from the implicit preference task and the explicit recognition task were analysed separately and all statistical tests were two-tailed.

Implicit Preference Task

One hundred and sixty six participants each completed 36 trials (*12-Negative; 12-Neutral, 12-Erotic*). This resulted in a total of 5,976 trials, of which 8 (0.13%) were removed as outliers. Response time data were checked with regards to the parametric assumption of normality, see Table 1.

Table 1 Showing mean skewness and kurtosis values for response times for each of the three conditions

		Trial Condition		
		Negative	Neutral	Erotic
Response Times	Skewness	5.11	5.23	4.37
	Kurtosis	38.08	38.62	27.76

Results of the Shapiro-Wilks tests indicated non-trivial violation of normality for the *Negative* ($W=0.97$, $p<0.001$), *Neutral* ($W=.97$, $p<0.001$) and *Erotic* ($W=.96$, $p<0.001$) conditions. Given the high (i.e., > 2 , see Gravetter & Wallnau, 2014) skewness and kurtosis values for these conditions a non-parametric test was used to examine differences in response time data.

The first confirmatory hypothesis tested whether participants would correctly identify the location of an *Erotic* image in less time than a *Neutral* image. Analysis using a Wilcoxon non-parametric test showed no difference in median response times between *Erotic* and *Neutral* images, $Z=-0.517$, $p=0.61$, $r=-0.02$. Descriptive data for response times is in Table 2.

Table 2 Showing median response times (milliseconds) and standard deviation scores for each of the three conditions

		Trial Condition		
		Negative	Neutral	Erotic
Median RT		1064.5	1138.0	1109.5
S.D.		1645.9	1825.1	1562.1

For *Accuracy* a trial was scored as an error if the participant gave an incorrect response (e.g., chose ‘Left’ when image was ‘Right’). Data were checked with regards to the parametric assumption of normality. Although the Shapiro-Wilks tests suggested the data may be non-normal, *Negative* ($W=0.97$, $p<0.001$), *Neutral* ($W=.97$, $p<0.001$) and *Erotic* ($W=.96$, $p<0.001$), the skewness and kurtosis values (see Table 3) were well within tolerable limits. Hence a parametric test was used.

Table 3 Showing mean skewness and kurtosis values for accuracy scores for each of the three conditions

		Trial Condition		
		Negative	Neutral	Erotic
Accuracy	Skewness	0.07	0.08	-0.14
	Kurtosis	-0.34	-0.17	0.58

The second confirmatory hypothesis tested whether participants were more accurate at identifying the location of *Erotic* images compared to chance (i.e., 50%). A one sample t test comparing accuracy of responses to the *Erotic* images to chance showed no significant difference, $t(165)=0.363$, $p=0.717$, 95% CI (-0.21, 0.31), $d=0.02$. Descriptive data for accuracy can be seen in Table 4.

Table 4 Showing mean accuracy scores with standard deviations for all three conditions

		Trial Condition		
		Negative	Neutral	Erotic
Mean Accuracy		6.05	6.02	6.05
S.D.		1.71	1.85	1.71

Exploratory analysis of a potential relationship between precognitive performance on the *Erotic* trials in the implicit preference task and belief in psi (using RPBS; Tobacyk, 2004) were conducted, see Table 5. These correlations showed a positive relationship between accuracy in responding to erotic images and superstition, and precognition. No other correlations were significant.

Table 5. Showing correlation coefficients (with significance values) between response times and accuracy to erotic images and the seven sub-scales of the RPBS

	Response Times		Accuracy	
	Correlation	Significance	Correlation	Significance
Traditional Religious Belief	0.12	0.09	0.05	0.48
Psi	0.05	0.48	0.10	0.18
Witchcraft	-0.02	0.79	-0.02	0.72
Superstition	-0.08	0.28	0.19	0.02*
Spiritualism	-0.04	0.57	0.11	0.15
Extraordinary Life Form	-0.07	0.33	-0.02	0.78
Precognition	-0.09	0.21	0.20	0.01*

* Significant at $p < 0.05$

Exploratory analysis of a potential relationship between the accuracy of precognitive performance on the *Erotic* trials in the implicit preference task and participant-experimenter interactions (using Interaction Questionnaire; Hitchman et al., 2016) were conducted, see Table 6. These correlations showed no clear relationships.

Table 6. Showing correlation coefficients (with significance values) between accuracy to erotic images and the seven sub-scales of the Interaction Questionnaire (scaled from 1=low to 7=high) completed by Participants and Experimenters

	Participant		Experimenter	
	Correlation	Significance	Correlation	Significance
Mood	-.078	0.31	-.070	0.37
Relaxation	-.137	0.08	-.053	0.49
Warmth	-.045	0.56	-.117	0.13
Spontaneity	-.148	0.06	-.092	0.24
Positivity	-.061	0.44	-.096	0.21
Rapport	-.058	0.46	-.113	0.15
Confidence	-.035	0.65	-.135	0.08

Explicit Recognition Task

One hundred and fifty nine participants each completed 48 trials in the test phase of the recognition task. Of these, 24 trials were ‘Old’ in that they had been seen before and from these 12 were repeated after the test (i.e., Precognitive) and 12 were not repeated (i.e., control). This gave a total of 1,908 precognitive trials, of which 66 (3.4%) were trimmed, and 1,908 control trials of which 58 (3.0%) were trimmed. One participant was also excluded for responding ‘Old’ to all trials and as such analysis is based on the remaining 158 participants. Response time data were checked with regards to the parametric assumption of normality, see Table 7.

Table 7 Showing mean skewness and kurtosis values for response times for repeated (i.e., precognitive) and control conditions

		Repeated	Not-Repeated
Response Times	Skewness	1.19	0.64
	Kurtosis	1.88	0.12

Although the Shapiro-Wilks tests suggested the data may be non-normal, *Repeated* ($W=0.92$, $p<0.001$), *Not Repeated* ($W=.96$, $p<0.001$), the skewness and kurtosis values (see Table 7) were well within tolerable limits (i.e., <2). Hence a parametric test was used.

The first confirmatory hypothesis tested whether participants would correctly recognise words that would be repeated later (i.e., Precognitively) in less time than those not repeated. Analysis using a repeated measures t test showed no difference in response times between *Repeated* and *Not Repeated* conditions (1073.8ms and 10859.9ms respectively), $t(158)=1.212$, $p=0.227$, 95% CI (-42.42, 10.15), $d=0.06$. Descriptive data for response times is in Table 8.

Table 8 Showing mean response times (milliseconds) and standard deviation scores for repeated and non-repeated conditions

	Repeated	Not-Repeated
Mean	1073.86	1089.99
S.D.	250.68	245.06

For *Accuracy* a trial was scored as an error if the participant gave an incorrect response (e.g., ‘Old’ when it was ‘New’ and vice versa). Data was examined in terms of *sensitivity* (i.e., d' or d prime), which was calculated by subtracting the z score corresponding to the false-alarm rate from the z score corresponding to the hit rate (see Macmillan & Creelman, 2005). This produces a measure of sensitivity or bias referred to as d' . This was initially checked with regards to the parametric assumption of normality, see Table 9.

Table 9 Showing mean skewness and kurtosis values for d' scores from repeated (i.e., precognitive) and non-repeated conditions

		Repeated	Not-Repeated
Response Times	Skewness	-0.571	0.28
	Kurtosis	3.75	3.69

Results of the Shapiro-Wilks tests indicated non-trivial violation of normality for the *Repeated* ($W=0.92$, $p<0.001$), and *Not Repeated* ($W=.93$, $p<0.001$) conditions. Given the high (i.e., > 2 , see Gravetter & Wallnau, 2014) kurtosis values for these conditions a non-parametric test was used to examine differences in sensitivity of responses.

The second confirmatory hypothesis tested whether participants would be more accurate (i.e., exhibit greater sensitivity) at recognising words which would be repeated later (i.e., Precognitively) compared to those not repeated. Analysis using a Wilcoxon non-parametric test showed no difference in median sensitivity levels between *Repeated* and *Non-Repeated* words, $Z=-0.4561$, $p=0.65$, $r=-0.02$. Descriptive data for sensitivity scores can be found in Table 10.

Table 10 Showing median sensitivity (d') and standard deviation scores for repeated and non-repeated conditions

	Repeated d'	Not-Repeated d'
Median	0.066	0.053
S.D.	1.171	1.145

Exploratory analysis of a potential relationship between recognition performance for items that would be *Repeated* after the test and belief in psi (using RPBS; Tobacyk, 2004) were conducted, see Table 11. These correlations showed no significant relationships.

Table 11. Showing correlation coefficients (with significance values) between response times and the seven sub-scales of the RPBS

	Response Times	
	Correlation	Significance
Traditional Religious Belief	.005	0.95
Psi	-.003	0.96
Witchcraft	-.055	0.49
Superstition	-.048	0.54
Spiritualism	.031	0.70
Extraordinary Life Form	-.041	0.61
Precognition	.003	0.97

SUMMARY

Data from the implicit preference task and the explicit recognition task show no evidence of any precognitive effects.