

Does Hindsight Bias Impair Learning?

Evidence from a visual pattern learning task

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Abstract

Pezzo & Quinn (2015) reported that hindsight bias (HSB) was negatively associated with learning. We used a similar but more difficult version of their task to replicate this and test the possibility that working memory drives this effect. Ss were trained to identify three impressionist artists' paintings. Two measures of HSB were taken during training: A memory measure and obviousness (OBV) of various stimuli with the answers provided. Prior to training, 2 measures of working memory were taken: Visual patterns test (VPT) and perceptual sensitivity test (PST), after training a second PST and a final multiple choice test was given. Regression analyses indicated that memory HSB was not associated with final test scores, but obviousness ratings were. Working memory as measured by the VPT was unrelated to HSB, but baseline perceptual sensitivity (PST) predicted both measures of obviousness.

Introduction

Does hindsight bias impair learning? (e.g., Fischhoff, 1975; Wears & Nemeth, 2007). Some say yes because it reduces surprise necessary to motivate learning. Others note that because a sensemaking process underlies the bias (Blank et al., 2008; Pezzo, 2003), HSB should be positively associated with learning (Hoch & Loewenstein, 1989; Nestler et al., 2012). To our knowledge no study has ever directly tested the relationship between learning and hindsight bias.

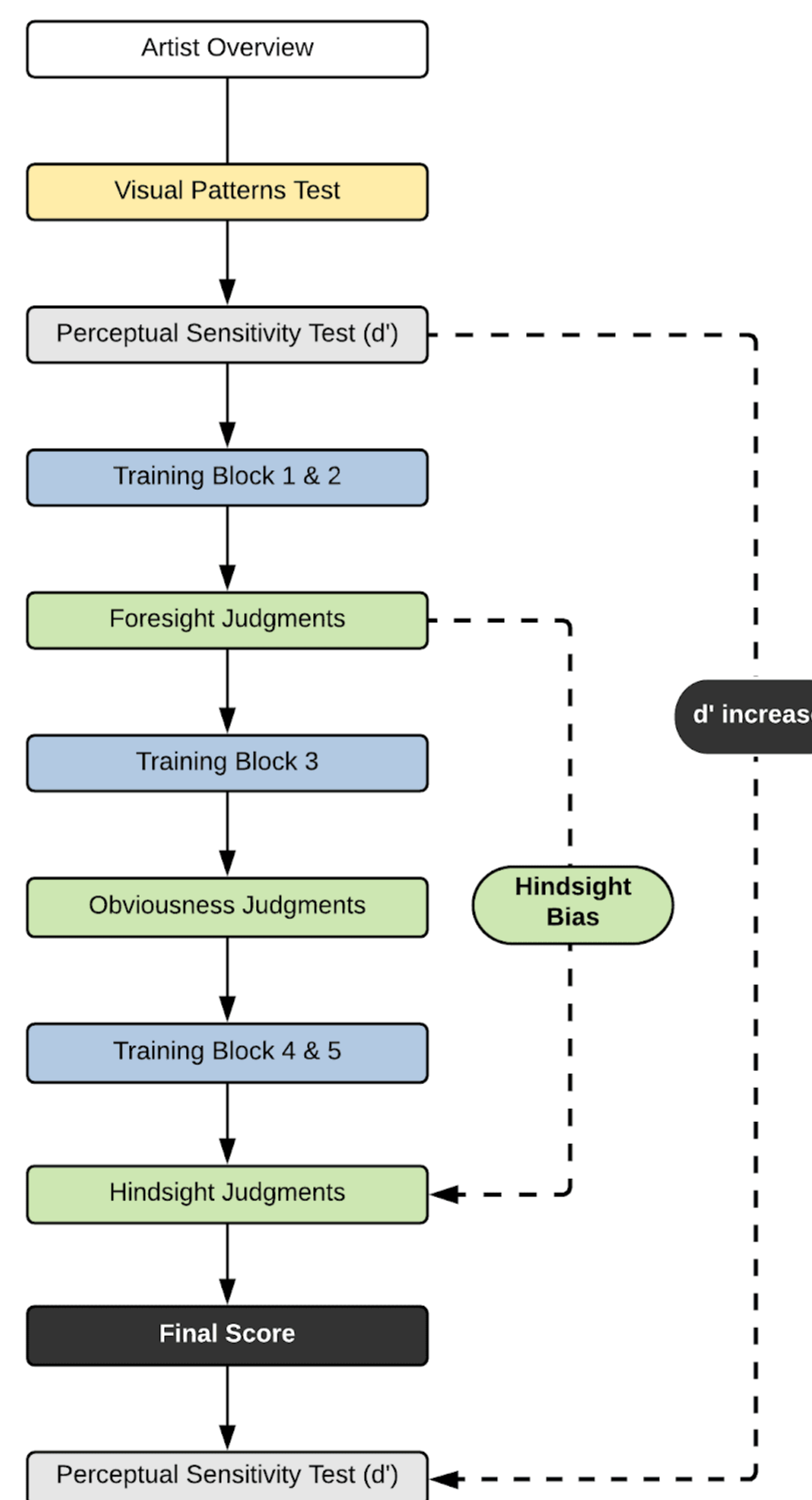
Method

mTurk workers ($N = 88$) were trained (1 hr) to recognize French Impressionist paintings as being the work of Cezanne, Degas, or Morisot. Ss were shown a total of 75 paintings (25 each artist). Before training, they received the **Visual Patterns Test** (VPT, Brown, et al., 2006) and the **Perceptual Sensitivity Test** (PST, Tanaka et al., 2005). Both are related to working memory. During training, they were given two different measures of hindsight bias:

- **Memory Measure (HSB):** Difference between ratings of likelihood (hindsight – foresight) that each painter is true artist. (30 paintings)
- **Obviousness Rating (OBV):** Mean rating after being told true artist (1 to 7 scale) (30 paintings) $\alpha = .$

Participants were then given a **final test** (60 unique MC items) and the **second PST**.

Training



Foresight Judgments



1. What's % that Cezanne painted this?
2. What's % that that Degas painted this?
3. What's % that Morisot painted this?

Hindsight Judgments

Ss shown same image (above) w/ correct answer, and asked to recall their previous (foresight) answers

Obviousness Judgments



This painting is by Degas

1. How **obvious** is this?
2. How likely would you have been to **guess** this?
3. How **surprising** is this? (reverse coded)

References

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Results

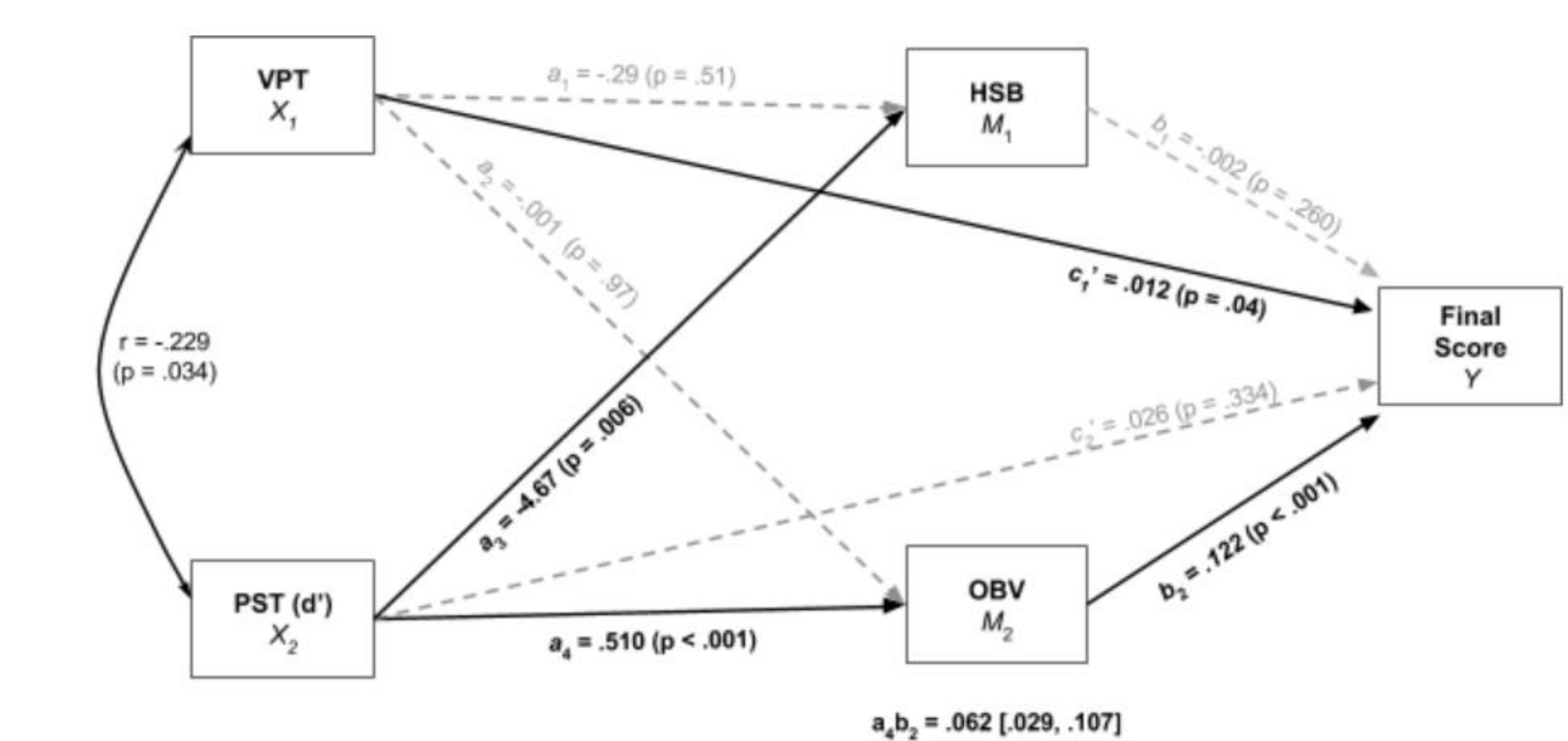
	HSB	OBV	PST	Final Score
VPT	-.062	.096	.141	.230**
HSB	--	-.077	-.226**	-.170*
OBV	--	--	.285**	.365**
PST	--	--	--	.349**

Pearson's r is reported for PST only. Kendall's tau_b is reported for all other correlations.
* $p < .05$ ** $p < .01$

DV = Final Score

Predictor	Mean	B	bias	SE	p	BCaL	BCaU
Constant		.09	.001	.180	.619	-.278	.443
HSB	8.65	-.002	.000	.002	.429	-.006	.003
OBV	5.55	.122	.000	.030	.001	.064	.182
VPT	6.34	.012	.001	.005	.009	.004	.020
PST	.805	.026	.000	.025	.315	-.026	.077

Note: Model $R^2 = .388$; $F(4, 85) = 12.824$, $p < .001$. HSB = Hindsight Bias; OBV = Obviousness; VPT = Visual Working Memory; PST = Perceptual Sensitivity (t1). Homoscedasticity violated; Bootstrapped 5000 BCa. 1 multivariate outlier retained. Coefficients and significance levels remain unchanged when dropped.



Discussion

This study replicated Pezzo & Quinn's (2015) finding that HSB (memory measure) during training is negatively correlated with test performance. However, when included in a regression model along with measures of obviousness and WM, HSB was no longer a significant predictor. Further, judgments of obviousness emerged as a strong positive predictor of performance. **High ratings of obviousness here do not reflect arrogance or overconfidence, but actual ability**, as also evidenced by the relationship with baseline PST. Figure 1 shows that obviousness ratings mediated the effect of PST on final score. Hindsight bias appears to be unrelated to learning.