Mindfulness and bias: More than sunk-costs

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Comment on Hafenbrack, Kinias & Barsade (2014). Debiasing the Mind Through Meditation: Mindfulness and the Sunk-Cost Bias, 25(2), 369-76.

Hafenbrack, Kinias, & Barsade (Experiment 1, 2014) reported a positive correlation between mindfulness (Mindful Awareness Attention Scale, MAAS: Brown & Ryan, 2003) and resistance to sunk-costs (Resistance to Sunk Costs subscale of the Adult Decision Making Competence index, RSC: Bruine, Parker, & Fischhoff, 2007). While the full set of studies reported by Hafenbrack, Kinias, & Barsade demonstrate a clear relationship between short-term manipulations of mindfulness and the ability to resist sunk-costs, the evidence that individual differences in trait mindfulness predict susceptibility to sunk-costs comes primarily from Experiment 1, which demonstrated a correlation between RSC and MAAS scores. The RSC demonstrated low internal consistency in that study, and, unlike some other measures of sunk-costs, e.g. Arkes and Blumer (1985), does not directly compared a participant's likelihood of persisting in a behavior under conditions of low and high investment. It is likely that the measure resistance to sunk-costs, but may also be related to a general tendency to persist in a behavior (such as one might see in self-justification, Festinger, 1957).

To further test the relationship between dispositional mindfulness and susceptibility to sunk-costs, I recruited 150 participants (Sample size based on Hafenbrack et al., 2014) using Amazon's mTurk service to complete the MAAS and a sunk-cost questionnaire recently developed (Strough, Schlosnagle, Karns, Lemaster, & Pichayayothin, 2014). The sunk-cost questionnaire uses eight vignettes, each of which are presented twice, once under conditions of high-investment, and once under conditions of low/no-investment. Participants completed the MAAS, half of the sunk-cost vignettes (4 framed as high investment, 4 framed as low/no-investment), the Rosenberg self-esteem scale (SE), a filler questionnaire measuring aggressive perceptions of actions, and finally the second half of the sunk-cost questionnaire (with the alternate wording for each vignette). As in Strough, Schlosnagle, Karns, Lemaster, and Pichayayothin (2014), sunk-cost fallacy scores (SCF) were calculated by scoring each vignette as a 1 if a participants indicated they would continue longer under conditions of high investment (compared to low/no-investment), and as a 0 otherwise, and summing across all eight

vignettes. The average score for each set of vignettes (low/no-investment framing [$SC_{low/no-investment}$], and high investment framing [$SC_{investment}$]) were also calculated to assess individual differences in preference to continue a behavior under conditions of either low or high investment.

I expected that MAAS (α = 0.92) scores would be negatively correlated with SCF (α = 0.86, measured across all 16 vignettes) scores, but this was not the case scores (r = -0.061, p = 0.456, see Table 1). Participants did show a sunk-cost effect: average ratings for vignettes presented with an investment framing ($SC_{investment}$: 2.43 [SD = 0.75, $SC_{low/no-investment}$: 2.18 [0.72]), a difference which was significant (t(149) = 7.3, p < 0.001, 95% CI for the difference = [0.18 0.32]). MAAS scores did tend to be negatively correlated with the responses to the sunk-cost questionnaire: there was a significant negative correlation between $SC_{low/no-investment}$ (r = -0.166, p = 0.043), whereas the correlation between $SC_{investment}$ was not significant, but also negative (r = -0.135, p = 0.099). SCF scores were not correlated with any other measure, except the aggression survey (α = 0.85) included as a filler (r = -0.186, p = 0.023). As expected, MAAS was significantly correlated with SE (r = 0.453, p < 0.001) and age (r = 0.262, p = 0.001).

To more directly replicate Study 1 of Hafenbrack, Kinias & Barsade (2014), I collected a second set of data, in which the RSC was added to the beginning of the survey. Also, items from the sunk-cost questionnaire were presented again in two sets, but this time each set included either all of the investment versions, or all of the low/no-investment versions. Data were collected from an undergraduate sample at an all-male private liberal arts college (n = 32) and from Amazon mTurk (n = 173). The undergraduate sample size was limited by the size of the Psychology Department pool.

Results from this survey replicated the findings reported by Hafenbrack et al. (2014). MAAS (α = 0.924) scores were significantly correlated with RSC (α = 0.416), SE (α = 0.936) and age (see Table 1). In a linear regression predicting RSC scores with MAAS, age, gender and SE scores entered as independent predictors, MAAS (β = 0.246, p = 0.001) and age β = 0.163, p = 0.029) were both significant predictors while gender (β = -0.013, p = 0.859) and SE (β = -0.025, p = 0.729) were not.

MAAS and SCF (α = 0.884) were also significantly correlated (r = -0.143, p = 0.042), and MAAS scores were significantly correlated with both $SC_{low/no\text{-}investment}$ (r = -0.248, p < 0.001) and $SC_{investment}$ (r = -0.281, p < 0.001). Interestingly, the relationship between RSC and SCF scores was in the predicted direction, but the two measures were not strongly related (r = -0.126, p = 0.074), and RSC scores were better related to both $SC_{low/no\text{-}investment}$ (r = -0.364, p < 0.001) and $SC_{investment}$ (r = -0.364, p < 0.001). After controlling for $SC_{low/no\text{-}investment}$ scores, there was a significant partial correlation between RSC and SCF (r = -0.216, p = 0.002), and a stronger relationship between SCF and MAAS (r = -0.202, p = 0.004). However, the correlation between MAAS and RSC remained significant when controlling for both SCF and $SC_{low/no\text{-}investment}$ scores (partial r = 0.176, p = 0.013).

Together, these results directly replicate the findings of Experiment 1 of Hefenbrack et al. (2014) demonstrating a positive correlation between the Resistance to Sunk-costs subscale and trait mindfulness, and extend this work by demonstrating a correlation between mindfulness and a separate measure of sunk-costs (Strough et al., 2014). However, scores on the Resistance to Sunk Costs scale may reflect a combination of sunk-costs as well as other dimensions (such as a tendency to continue a course of action, regardless of investment). These results support the claim that trait mindfulness is related to resistance to sunk costs, but indicate that mindfulness is also well related to an individual's willingness to change a disadvantageous course of action, independent of investment.

		1	2	3	4	5	6	7	8
1	MAAS								
	#1 - mTurk								
	#2 - Undergrad								
	#2 - mTurk								
	#2 - Combined								
2	RSC								
	#1 - mTurk	–							
	#2 - Undergrad	0.109							
	#2 - mTurk	0.289**							
	#2 - Combined	0.281**							
3	SCF								
	#1 - mTurk	-0.061	–						
	#2 - Undergrad	-0.004	0.182						
	#2 - mTurk	-0.151*	-0.139						
	#2 - Combined	-0.143*	-0.126						
4	$Sunk_{no/low\ invest}$								
	#1 - mTurk	-0.166*	–	-0.111					
	#2 - Undergrad	-0.561**	0.096	-0.452*					
	#2 - mTurk	-0.198**	-0.394**	-0.194*					
	#2 - Combined	-0.248**	-0.364**	-0.196**					
5	$Sunk_{investment}$								
	#1 - mTurk	-0.135	–	0.835**	0.337**				
	#2 - Undergrad	-0.515**	0.225	0.385*	0.533**				
	#2 - mTurk	-0.232**	-0.403**	0.326**	0.795**				
	#2 - Combined	-0.281**	-0.364**	0.361**	0.769**				
6	SE								
	#1 - mTurk	0.453**	–	-0.055	-0.063	0.058			
	#2 - Undergrad	0.368*	0.072	0.121	-0.603**	-0.366			
	#2 - mTurk	0.400**	0.113	-0.005	-0.126	-0.157*			
	#2 - Combined	0.385**	0.090	0.024	-0.156*	-0.151*			
7	Age								
	#1 - mTurk	0.262**	–	-0.055	-0.114	-0.138	0.101		
	#2 - Undergrad	–	–	–	–	–	–		
	#2 - mTurk	0.272**	0.178*	-0.124	-0.130	-0.180*	0.195**		
	#2 - Combined	0.272**	0.230**	-0.171*	-0.173*	-0.253**	0.133		
8	Gender								
	#1 - mTurk	-0.027	–	-0.021	0.054	0.043	-0.021	-0.298**	
	#2 - Undergrad	–	–	–	–	–	–	–	
	#2 - mTurk	0.001	-0.019	-0.035	0.123	0.094	0.060	-0.221*	
	#2 - Combined	-0.026	-0.072	0.017	0.154*	0.154*	0.079	-0.311**	
9	Aggression								
	#1 - mTurk	0.047	–	-0.186*	-0.042	-0.152	0.042	0.117	-0.041
	#2 - Undergrad	-0.398*	0.180	-0.153	0.342	-0.035	-0.068	–	–
	#2 - mTurk	-0.144	-0.080	0.078	0.032	0.048	0.018	0.089	-0.108
	#2 - Combined	-0.166*	-0.018	0.016	0.053	0.000	-0.005	0.127	-0.131

Table 1. Correlations between survey measures for the two samples are shown. Survey #1 was administered to 150 mTurk participants, and did not include the RSC. Survey #2 was administered to 32 undergraduate males, and 173 mTurk participants. Correlations for both the undergraduate and mTurk samples are show separately, as well as the combined sample. Correlations with gender and age are omitted for the undergraduate sample, which was all male, and whose ages ranged from only 18-22 years. *$p < 0.05$, **$p<0.01$

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