Abstract

Working memory capacity has been shown to be related to some IAT *D* measures and has also been suggested to be involved in faking processes. However, research has yet to investigate whether working memory load (WML) impacts all *D* measures in the same way and how WML impacts faked IAT *D* measures. Thus, the current study investigated the impact of WML on nonfaked and faked IAT *D* measures by randomly assigning 48 participants to one of two experimental groups. In Session 1, both groups took the IAT under standard instructions (baseline). In Session 2, both groups took the IAT while simultaneously working on the random number generation (RNG) task to stress their WM (baseline under WML). In Session 3, both groups were given faking strategies and were asked to fake either high or low scores on the IAT (faking). In Session 4, both groups were asked to fake again while simultaneously working on the RNG task (faking under WML). The results revealed similar impacts of WML on *D* measures under nonfaking conditions. Under faking conditions, WML somewhat attenuated the effect of the faking of high scores (i.e., the more difficult faking condition) but did not impact the faking of low scores. Moreover, the results imply that the faking strategies of slowing down versus accelerating are associated with different aspects of WM, which provides more detailed insight into the faking process.

Theoretical background

Status quo

- 10 *D* measures (i.e., D_1 to D_6) to compute the IAT effect (Greenwald, Nosek, & Banaji, 2003a, 2003b)
- Researchers use different *D* measures (e.g., Glashouwer, Smulders, de Jong, Roefs, & Wiers, 2013)
- Results depend on which *D* measure is used (Wilson & Scior, 2014)
- 2 *D* measures (i.e., D_2 and D_6) are associated with participants' WM (e.g., Klauer, Schmitz, Teige-Mocigemba, & Voss, 2010; Schmitz, Teige-Mocigemba, Voss, & Klauer, 2013)
- Impact on the remaining *D* measures (i.e., D_1, D_3, D_4, and D_5) not investigated
- Faking on the IAT is possible (e.g., Röhner, Schröder-Abé, & Schütz, 2011, 2013)
- Faking is considered to require capacity in WM (e.g., Ding, Du, Lei, Hu, Fu, & Chen, 2012)
- Impact on faked *D* measures not investigated

Research questions

1. How does WML affect *D* measures under standard (nonfaking) situations?
2. How does WML impact faked *D* measures?

	Variations in the *D* measures					
Details of the computation	D_1	D_2	D_3	D_4	D_5	D_6
Which blocks are included?	Include all blocks from the compatible and incompatible phases (i.e., Blocks 3, 4, 6, and 7)					
Which trials are included?	Include all trials from Blocks 3, 4, 6, and 7					
Is a treatment applied to the upper tail?	Yes (i.e., Delete if latency > 10,000 ms)					
Is a treatment applied to the lower tail?	No	Yes (i.e., Delete if < 400 ms)	No	No	Yes (i.e., Delete if < 400 ms)	Yes (i.e., Delete if < 400 ms)
How are errors treated?	Include error latencies in analyses		Replace errors: mean(C) + 2 *SD*	Replace errors: mean(C) + 600 ms	Replace errors: mean(C) + 2 *SD*	Replace errors: mean(C) + 600 *ms*
Computational formula	(RT incompatible phase – RT compatible phase)/SD in RT					

Note. RT = reaction time, *SD* = standard deviation.

Method

Sample

- 48 students from the Technical University Chemnitz (30 female, average age of 21.92 years [*SD* = 3.25])

Measures

- Extraversion IAT (Back, Schmukle, & Egloff, 2009)
- Random Number Generation (RNG) task (Towse & Neil, 1998)

Design

Group \ t	t_1	t_2	t_3	t_4
Faking low	Baseline	Baseline under WML	Faking	Faking under WML
Faking high	Baseline	Baseline under WML	Faking	Faking under WML

Results and Implications

Post Hoc Comparisons of the Variations in the *D* Measures from the Extraversion IAT

Measurement occasion	D_1		D_2		D_3	
	Faking Low *M (SD)*	Faking High *M (SD)*	Faking Low *M (SD)*	Faking High *M (SD)*	Faking Low *M (SD)*	Faking High *M (SD)*
Baseline	0.45_{a1} (.041)	0.34_{a1} (0.38)	0.45_{a1} (0.41)	0.34_{a1} (0.38)	0.53_{a1} (0.50)	0.39_{a1} (0.44)
Baseline under WML	0.09_{a2} (0.41)	0.04_{a2} (0.45)	0.09_{a2} (0.41)	0.03_{a2} (0.45)	0.11_{a2} (0.58)	0.04_{a2} (0.61)
Faking	-1.10_{a3} (0.58)	1.27_{b3} (0.45)	-1.10_{a3} (0.58)	1.27_{b3} (0.44)	-1.16_{a3} (0.65)	1.40_{b3} (0.42)
Faking under WML	-0.93_{a3} (0.36)	0.90_{b4} (0.56)	-0.93_{a3} (0.36)	0.91_{b4} (0.54)	-1.04_{a3} (0.41)	1.06_{b3} (0.68)

	D_4		D_5		D_6	
	Faking Low *M (SD)*	Faking High *M (SD)*	Faking Low *M (SD)*	Faking High *M (SD)*	Faking Low *M (SD)*	Faking High *M (SD)*
Baseline	0.49_{a1} (0.47)	0.38_{a1} (0.42)	0.53_{a1} (0.50)	0.40_{a1} (0.45)	0.49_{a1} (0.47)	0.38_{a1} (0.42)
Baseline under WML	0.11_{a2} (0.45)	0.04_{a2} (0.51)	0.11_{a2} (0.58)	0.02_{a2} (0.62)	0.11_{a2} (0.44)	0.03_{a2} (0.52)
Faking	-1.11_{a3} (0.60)	1.31_{b3} (0.42)	-1.15_{a3} (0.67)	1.38_{b3} (0.42)	-1.11_{a3} (0.60)	1.29_{b3} (0.42)
Faking under WML	-0.97_{a3} (0.42)	0.93_{b4} (0.60)	-1.04_{a3} (0.42)	1.04_{b3} (0.63)	-0.97_{a3} (0.42)	0.95_{b3} (0.56)

Note. *N* = 48; Different alphabetic subscripts indicate significant differences between experimental groups (i.e., columns); different numeric subscripts identify significant differences between measurement occasions (i.e., rows) at $p < .015$.

Results of the Paired Sample *t* Tests on the WML Indices

Group	IAT phase	Index	Measurement Occasion: Baseline under working memory load *M*	*SD*	Faking under working memory load *M*	*SD*	*t*(23)	BCa 95% CI	Cohen's *d*
Faking Low	Compatible	R	4.70	2.34	4.44	2.71	0.41	[-1.02, 1.39]	0.11
		RNG	0.35	0.06	0.37	0.07	-1.83	[-0.48, -0.01]	-0.33
		RNG2	0.27	0.04	0.32	0.06	-5.16	[-0.07, -0.03]	-1.25
Faking High	Compatible	R	5.27	3.72	6.60	3.59	-2.15	[-2.63, -0.08]	-0.36
		RNG	0.33	0.07	0.33	0.06	0.05	[-0.02, 0.02]	0.00
		RNG2	0.27	0.05	0.26	0.05	0.52	[-0.02, 0.03]	0.19
Faking Low	Incompatible	R	4.84	2.66	5.81	3.35	-1.67	[-2.08, 0.17]	-0.36
		RNG	0.34	0.08	0.34	0.07	-0.02	[-0.03, 0.03]	0.00
		RNG2	0.27	0.06	0.28	0.06	-0.66	[-0.03, 0.01]	-0.17
Faking High	Incompatible	R	5.56	3.53	6.02	3.55	-0.75	[-1.57, 0.76]	-0.13
		RNG	0.32	0.06	0.37	0.07	-3.32	[-0.07, -0.02]	-0.83
		RNG2	0.26	0.05	0.32	0.06	-5.60	[-0.07, -0.04]	-1.20

Note. *N* = 48; *$p \leq .05$.

1. **How does WML affect *D* measures under standard (nonfaking) conditions?**
   - All *D* measures were decreased under working memory load. This result is not trivial as the *D* measures differ in their computation which may have produced different results. The findings underpin the assumption that D measures are in principle rather comparable and similar (Greenwald et al., 2003a, 2003b) and might in turn also alleviate concerns about the use of different *D* measures in IAT research.
2. **How does WML impact faked *D* measures?**
   - The results showed that the answer depends on faking direction. Whereas faking low scores was not significantly attenuated under WML for all *D* measures, faking high scores was significantly attenuated for some of the *D* measures. The result that only faking high (but not low) was somewhat affected by WML is in line with previous research that revealed that faking high scores is more difficult than faking low scores (Röhner et al., 2011). In general, under faking (as opposed to baseline) conditions, both groups showed more WML. This finding indicates that faking is indeed associated with WM (Ding et al., 2012). However, under faking high, compared with faking low, more WML indices increased significantly (i.e., the WM of high-score fakers might have experienced greater stress). These results are in line with Röhner et al. (2011), who showed that it is easier to fake low on the IAT than to fake high. Additionally, WML was challenged in somewhat different ways when low or high scores had to be faked as the two directions require different strategies.

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