

Great Minds Do Not Think Alike

Nick Byrd, [@byrd_nick](#), [facebook.com/byrdnick](#)

Florida State University



Many philosophers

- (a) accept that relying on unreflective intuition is standard fare in philosophy (e.g., Chalmers, 2014; De Cruz, 2014; Kornblith, 1998; Mallon, 2016).
- (b) treat reflection as crucial for philosophical inquiry (e.g., Goodman, 1983; Hursthouse, 1999; Korsgaard, 1996; Rawls, 1971; Sidgwick, 1874; Sosa 1991).

Many cognitive scientists

- (c) base theories of reasoning on distinctions such as the unreflective-reflective distinction (e.g., De Neys 2017; Greene, 2013; Shea & Frith, 2016; Stanovich & Evans, 2013)
- (d) measure unreflective and reflective reasoning (e.g., Evans, Barston, and Pollard, 1983; Frederick, 2005; Sirota, Kostovicova, Juanchich, Dewberry, & Marshal, 2018)

Examples of philosophy-reflection correlations among non-philosophers

- Atheists are more reflective than theists (Pennycook et al., 2016)
- Social conservatives are less reflective than social liberals (Deppe et al., 2015)

However, some of those correlations might be explained by other factors

- Gender (Frederick, 2005; cf. Byrd & Conway, 2019)
- Age (Byrd & Conway, 2019)
- Training in philosophy (Livengood et al., 2010)
- Culture (e.g., Gervais et al., 2018)
- Personality (e.g., Alper & Yilmaz, 2019).

The ceiling effect response

“[I care about the judgments of philosophers, not untrained non-philosophers. Philosophers are so reflective that there is not enough variance in their dispositions to reflect to predict their philosophical judgments from reflection.]”

Empirical questions

1. Will reflection predict philosophers' views? Same direction(s) as non-philosophers views?
2. How will correlations change after controlling for age, culture, gender, personality, etc.?
3. Which, if any, of the findings will replicate in a larger, pre-registered study?

Goals

- A. Survey philosophers' philosophical beliefs.
- B. Observe philosophers' reliance unreflective and reflective judgments.
- C. Also gather information about philosophers age, culture, gender, and personality.
- D. Raw (zero-order) correlations. Follow-up on significant correlations with multiple regression.

Study 1 Methods

- Expected effect size: $r \cong .18$ (Pennycook et al., 2016) or else $r \cong .2$ (Gignac & Szodorai, 2016).
- For 99% power to detect smaller $r = .18$, GPower suggested a sample size of 479 participants.
- 979 online participants were recruited from LeiterReports.com. Decided a priori to exclude incomplete (N = 382) and insincere (N = 2) surveys—E.g., Country of residence: “Narnia”, “Texas”. Remaining N = 594.
- 108 female; 485 identified as White, 37 as Multiethnic, 23 as Asian, 22 as Hispanic or Latino, 4 as Black, 3 as Carribean, 1 as American Indian or Native American, and 19 as other ethnicity.
- University of Colorado IRB protocol #13-0678. Survey completed in 2014 via Qualtrics. Data analyzed using R 3.5.3.
- 19/20 PhilPapers items (Bourget & Chalmers, 2014)—Newcomb’s paradox omitted. Lay translations (Table 1).
- 3-item Cognitive Reflection Test (CRT) (Frederick, 2005). E.g., “A bat and a ball cost ...”
- Ten Item Personality Inventory (TIPI) of Big Five (Gosling, Rentfrow, & Swann Jr., 2003)
- Citizenship in WEIRD or non-WEIRD nations (Klein et al., 2018).

Table 1. Example of how responses to “Do you have (or are you a candidate for) a Ph.D. in philosophy?” determined PhilPapers survey question that participants received.

Yes (Study 1 N = 328; Study 2 N = 280)	No (Study 1 N = 267; Study 2 N = 427)
Free will: incompatibilism or compatibilism?	If every event in the universe is determined, do you think it is possible that there could be free will?
<input type="checkbox"/> Accept incompatibilism	<input type="checkbox"/> Accept no
<input type="checkbox"/> Lean toward incompatibilism	<input type="checkbox"/> Lean toward no
<input type="checkbox"/> I don't know	<input type="checkbox"/> I don't know
<input type="checkbox"/> No inclination	<input type="checkbox"/> No inclination
<input type="checkbox"/> Lean toward compatibilism	<input type="checkbox"/> Lean toward yes
<input type="checkbox"/> Accept compatibilism	<input type="checkbox"/> Accept yes

Study 1 Descriptive Statistics

- Reflection means and standard deviations in Table 2. (Philosophers are more reflective.)
- Unreflective reasoning predicted (i) Russellianism about language, (ii) incompatibilism, (iii) theism, (iv) the so-called deontological (do not switch) response to the trolley problem, and (v) a physical view of personal identity (red lines, Figure 1; Table 3).
- Reflective reasoning predicted (vi) compatibilism, (vii) atheism, and (viii) the so-called utilitarian (switch) response to the trolley problem (blue lines; Figure 1; Table 3).

Table 2. Means and standard deviations for 3-item Cognitive Reflection Test in Study 1.

	Minimum	Maximum	Mean	Standard Deviation
Unreflective CRT Responses	0	3	.42	.72
Reflective CRT Responses	0	3	2.34	.90

Figure 1. Significant correlations between philosophers' views and reflection in Study 1 (N = 594).

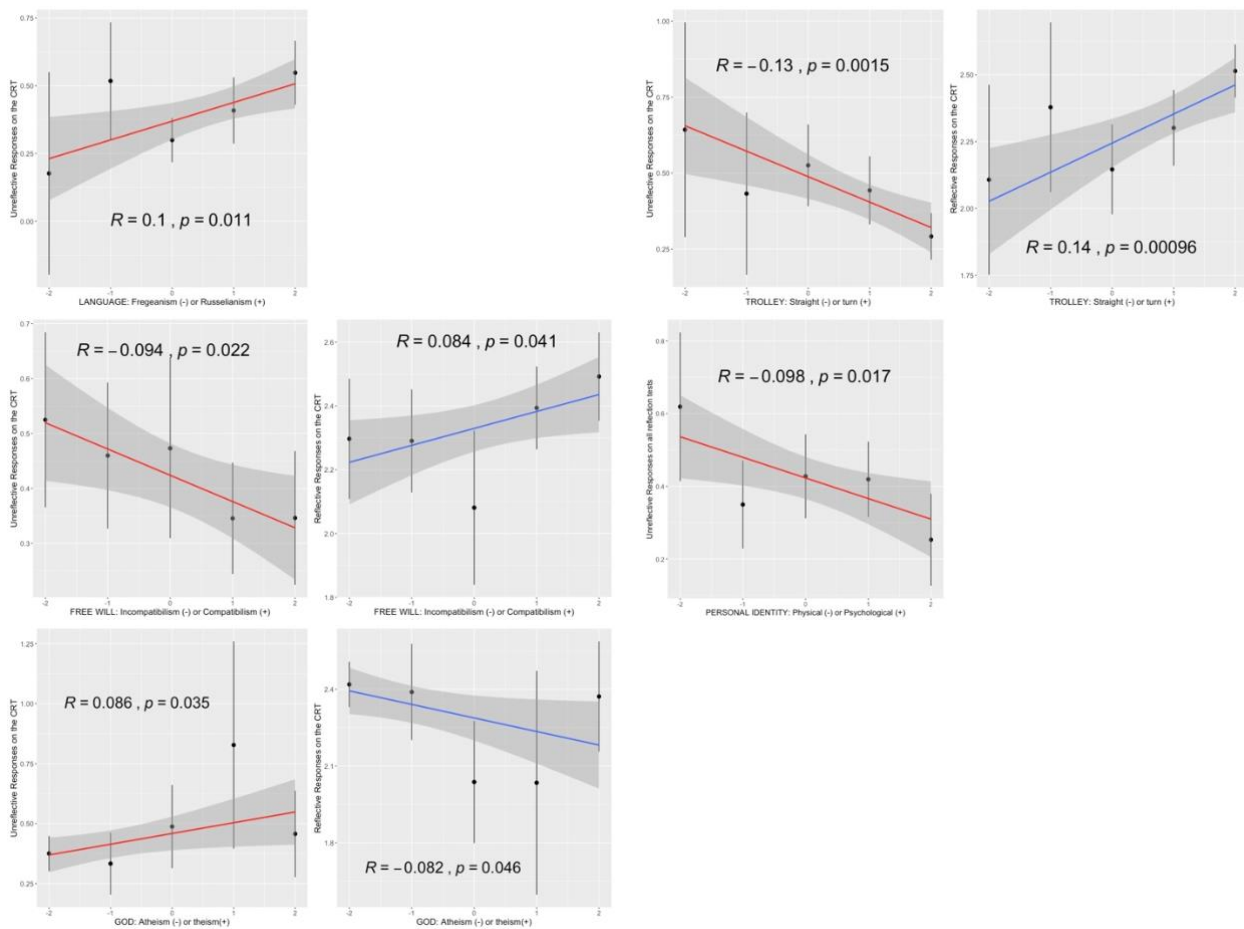


Table 3. Correlations predicting philosophical views from unreflective or reflective responses to the 3-item CRT in Study 1 (N = 594).

Unreflective (CRT)	Reflective (CRT)	PhilPapers Item: Response options. Coding in parentheses.
-.06	.06	1. Mind: Accept anti-physicalism (-2), Lean anti-physicalism (-1), No inclination (0), Lean physicalism (1), or Accept physicalism (2)?
-.05	.02	2. Mental Content: Accept internalism (-2), Lean internalism (-1), No inclination (0), Lean externalism (1), or Accept externalism (2)?
.10*	-.05	3. Language: Accept Russellianism (-2), Lean Russellianism (-1), No inclination (0), Lean Fregeanism (1), or Accept Fregeanism (2)?
.07	-.04	4. Analytic-Synthetic Distinction: Accept no (-2), Lean no (-1), No inclination (0), Lean yes (1), or Accept yes (2)?
-.01	.04	5. Time: Accept A-theory (-2), Lean A-theory (-1), No inclination (0), Lean B-theory (1), or Accept B-theory (2)?
-.02	.03	6. Laws of nature: Accept Humeanism (-2), Lean Humeanism (-1), No inclination (0), Lean non-Humeanism (1), or Accept non-Humeanism (2)?
.03	-.05	7. Justification: Lean externalism (-2), Lean externalism (-1), No inclination (0), Lean internalism (1), or Accept internalism (2)?
-.09*	.08*	8. Free Will: Accept incompatibilism (-2), Lean incompatibilism (-1), No inclination (0), Lean compatibilism (1), or Accept compatibilism (2)?
.09*	-.08*	9. God: Accept atheism (-2), Lean atheism (-1), No inclination (0), Lean theism (1), or Accept theism (2)?
.06	-.03	10. Meta-ethics: Accept moral anti-realism (-2), Lean moral anti-realism (-1), No inclination (0), Lean moral realism (1), or Accept moral realism (2)?
-.00	.04	11. Moral Judgment: Accept internalism (-2), Lean internalism (-1), No inclination (0), Lean externalism (1), or Accept externalism (2)?
.00	-.06	12. Normative Ethics: Accept consequentialism (-2), Lean consequentialism (-1), No inclination (0), Lean deontology (1), Accept deontology (2)?
-.03	.03	13. Politics: Accept Libertarianism (-2), Lean libertarianism (-1), No inclination (0), Lean egalitarianism (1), or Accept egalitarianism (2)?
-.05	.04	14. Science: Accept anti-realism (-2), Lean anti-realism (-1), No inclination (0), Lean realism (1), or Accept realism (2)?
-.01	.03	15. Abstract Objects: Lean nominalism (-2), Lean nominalism (-1), No inclination (0), Lean Platonism (1), or Accept Platonism (2)?
-.05	.02	16. Knowledge: Accept empiricism (-2), Lean empiricism (-1), No inclination (0), Lean rationalism (1), or Accept rationalism (2)?
.03	-.04	17. Metaphilosophy: Accept naturalism (-2), Lean naturalism (-1), No inclination (0), Lean non-naturalism (1), or Accept non-naturalism (2)?
-.13**	.14***	18. Trolley Problem: Accept straight (-2), Lean straight (-1), No inclination (0), Lean turn (1), or Accept turn (2)?
-.10*	.07	19. Personal Identity: Accept physical (-2), Lean physical (-1), No inclination (0), Lean psychological (1), or Accept psychological (2)?

Note: * $p < .05$, ** $p < .01$, *** $p < .001$

Multiple regression analysis of Study 1

- Tested only the five PhilPapers items that correlated with unreflective or reflective responses.
- Unreflective CRT responses predicted only Fregeanism about language above and beyond prior familiarity with the CRT, Ph.D. status, gender, culture, and personality (Table 4)
- Reflective CRT responses also predicted only Fregeanism about language above and beyond prior familiarity with the CRT, Ph.D. status, gender, culture, and personality (ibid.).

Table 4. Standardized multiple regression coefficients predicting philosophical views from unreflective responses on 3 reflection tests (CRT), reflective responses on CRT, prior CRT familiarity, philosophy Ph.D. status, gender, and WEIRDness in Study 1 (N = 594).

	Language Russellianism or Fregeanism?	Free Will Incompatibilism or compatibilism?	God Atheism or theism?	Trolley Problem Straight or turn?	Personal Identity Physical or psychological?
Unreflective (CRT)	.14**	-.06	.05	-.04	-.12†
Reflective (CRT)	.15** NEW!	.00	-.03	.06	-.06
Familiar with CRT?	-.11**	.11**	.02	.03	-.01
Philosophy Ph.D.?	-.55***	.17***	-.04	.12**	.28***
Gender (M = -.5, W = .5)	.03	.02	.00	-.17***	.06
WEIRD nation	-.06†	.11**	-.04	.07†	.02
Extraversion	-.04	-.03	.00	.09*	-.00
Agreeableness	.05	.05	.11*	-.03	.06
Conscientiousness	.00	-.00	.03	-.09*	.02
Stability	.03	.05	-.03	.05	-.00
Openness	.03	.11**	-.10*	.09*	-.01
Combined Adjusted R ²	.33***	.07***	.013†	.08***	.09***

Note: † p < .1, * p < .05, ** p < .01, *** p < .001

Limitations

- *CRT familiarity*. Predicted philosophers' views as much as reflection. Need less familiar CRT.
- *Numeracy*: the CRT is a math test, partially confounded with numeracy (Byrd & Conway, 2019). Need to control for numeracy.
- *Culture*: not enough participants from non-WEIRD nations (N = 38) for sufficient power to detect small correlations with culture. Undermines justification for asking for this information.
- *Sample*: LeiterReports.com's readership may not be representative sample of philosophers. Need to recruit from more and more diverse online communities of philosophers.
- *Power*. Smallest correlations ($r = 0.08$) smaller than expected $r \cong 0.18$. Posthoc power analysis: Study 1 had 62% power to detect its smallest correlations. Need more participants.

Study 2 Methods

- For 80% power to detect mean effect size of Study 1 ($r = .1$), need 782 participants.
- 970 online participants recruited from mTurk, LeiterReports.typepad.com, DailyNous.com, and the PHILOSOP listserv. Decided apriori to remove incomplete ($n = 263$) and insincere surveys ($n = 2$)- i.e., two people reported randomly selecting answers. Remaining $N = 705$.
- 172 female, 1 intersex; 548 identified as White, 65 as Asian, 43 as Multiethnic, 16 as Black or African American, 2 as American Indian or Native American, and 31 as other ethnicity.
- Florida State IRB Protocol #2018.25325. Survey completed in 2019 via Qualtrics. Data analyzed via R 3.5.3.
- Same measures as study 1 plus over a dozen more reflection test items (Baron, Scott, Fincher, & Metz, 2015), a 4-item behavioral measure of numeracy (Cokely, Galesic, Schulz, Ghazal, & Garcia-Retamero, 2012), minus country of citizenship.
- Protocol and analytic strategy pre-registered on osf.io

Study 2 Descriptive Statistics

- Reflection means and standard deviations in Table 5.
- Replicated reflection-philosophy correlations of Study 1—bigger r s and smaller p s (Table 6).
- Some new correlations, especially for newer, less familiar reflection test items (ibid.)

Table 5. Mean unreflective and reflective responses from Study 2 ($N = 705$).

	Minimum	Maximum	Mean	Median	Standard Deviation
Unreflective Responses	0	14	3.85	3	2.95
Reflective Responses	1	18	12.31	14	3.93

Study 2 Multiple Regression

- Similar reduction in unreflective/reflective responses' predictions of philosophers' views after controlling for numeracy, actively open-minded thinking, age, gender, and personality with multiple regression (Table 7).
- Above and beyond the predictions of numeracy, actively open-minded thinking, philosophy Ph.D. status, age, gender, and personality
 - ◆ unreflective responses on all new reflection tests predicted (i) anti-physicalism about mind, (ii) Fregeanism about language (a replication of Study 1), (iii) theism, (iv) non-naturalism, and (v) the psychological view of personal identity.
 - ◆ reflective responses on all new reflection tests predicted (vi) Fregeanism about language (another replication of Study 1), (vii) theism, (viii) nonnaturalism, and (ix) the psychological view of identity.
- Why did unreflective and reflective responses predict many of the same views? Because philosophers are more reflective— $r = 0.42$, $p < 0.001$ —and more likely to be non-naturalists— $r = 0.08$, $p = .03$. So does being a philosopher (i.e., having a Ph.D. in philosophy)

mediate the relationship between reflection and views like non-naturalism? Monte Carlo power analysis for indirect effects running 1000 replications and 20000 draws per repetition suggested that Study 2 had 97% power to detect such an indirect effect (Schoemann, Boulton, and Short, 2017). RMediation supported the mediation hypothesis, finding an indirect effect of Ph.D. status on the relationship between reflection and metaphilosophy— $ab = 1.762$, $SE = 0.44$, 95% CI [0.921, 2.648] (Tofghi & MacKinnon, 2011). In short, it's not reflection *per se* that predicts philosophers' tendency toward views like non-naturalism. It's their education.

Table 6. Correlations predicting philosophical views from all reflection tests: original 3-item CRT and all other reflection tests in Study 2 (N = 705).

Unreflective (original)	Reflective (original)	Unreflective (new)	Reflective (new)	PhilPapers Item: Response options (- to +)
-.15***	.17*** NEW!	-.29***	.28***	1. Mind : Anti-physicalism (-) or physicalism (+)?
-.13***	.15*** NEW!	-.22***	.24***	2. Mental Content : Internalism (-) or externalism (+)?
-.09*	.12** REPLICATED	-.13***	.17***	3. Language : Russellianism (-) or Fregeanism (+)?
.01	-.03	.09*	-.09*	4. Analytic-Synthetic Distinction : No (-) or Yes (+)?
-.11**	.07	-.11**	.13***	5. Time : A-theory (-) or B-theory (+)?
-.00	.03	-.07	.08*	6. Laws of nature : Humeanism (-) or non-Humeanism (+)?
-.05	.06	-.09*	.07†	7. Justification : Externalism (-) or internalism (+)?
-.04	.03 REPLICATED	-.11**	.13***	8. Free Will : Incompatibilism (-) or compatibilism (+)?
.24***	-.26*** REPLICATED	.35***	-.34***	9. God : Atheism (-) or theism (+)?
-.05	.06	-.08*	.08*	10. Meta-ethics : Moral anti-realism (-) or moral realism (+)?
-.02	.02	-.01	-.01	11. Moral Judgment : Internalism (-) or externalism (+)?
.01	.03	-.01	.01	12. Normative Ethics : Consequentialism (-) or deontology (+)?
-.12***	.15*** NEW!	-.23***	.25***	13. Politics : Libertarianism (-) or egalitarianism (+)?
-.19***	.21*** NEW!	-.21***	.23***	14. Science : Anti-realism (-) or realism (+)?
-.07	.08*	-.09*	.10**	15. Abstract Objects : Nominalism (-) or Platonism (+)?
-.03	.03	-.03	.02	16. Knowledge : Empiricism (-) or rationalism (+)?
.09*	-.11** NEW!	.11***	-.08*	17. Metaphilosophy : Naturalism (-) or non-naturalism (+)?
-.12***	.15*** REPLICATED	-.18***	.20***	18. Trolley Problem : Straight (-) or turn (+)?
-.07	.07 REPLICATED	-.16***	.20***	19. Personal Identity : Physical (-) or psychological (+)?

Note: * $p < .05$, ** $p < .01$, *** $p < .001$

Conclusions. In two studies (N = 1299)—one pre-registered—reflection predicted philosophers' views similarly to the way reflection has predicted non-philosophers' views.

- Less reflective philosophers tended to accept non-physical, non-naturalist views/entities.
- Age, gender, and personality also explained some of the reflection-philosophy correlations.

Discussion. Opportunities for further research. Normative inferences and their obstacles.

Figure 2. Sig. correlations between philosophy and new reflection tests, Study 2 (N = 705).

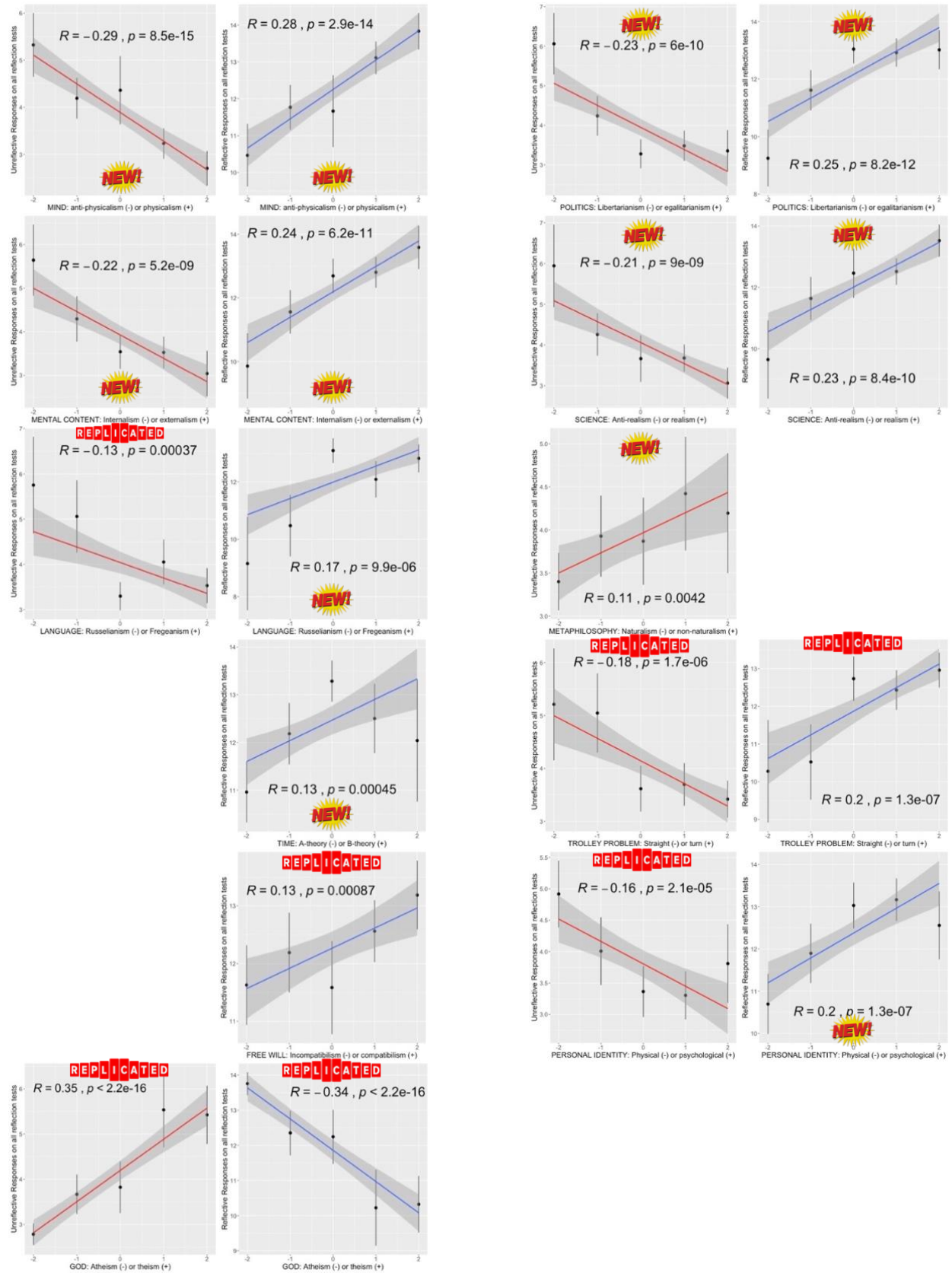


Table 7. Standardized multiple regression coefficients predicting philosophical views from unreflective responses to all new reflection tests, reflective responses on all new reflection tests, Philosophy Ph.D. status, Age, Gender, and Personality, in Study 2 (N = 705).

	Mind Anti-physicalism or physicalism?	Mental Content Internalism or externalism?	Language Russellianism or Fregeanism?	Time A-theory or B-theory?	Free will Incompatibilism or compatibilism?	God Atheism or theism?	Politics Libertarianism or egalitarianism?	Science Anti-realism or realism?	Metaphilosophy Naturalism or non- naturalism?	Trolley Problem: Straight or turn?	Personal Identity Physical or psychological?
Unreflective responses	-.27*	.09	.26*	.09	.09	.43***	.01	-.06	.41***	.01	.27*
Reflective responses	-.11	.21	.49*** ↻	.10	.20	.27* ↻	.14	.06	.39** ↻	.01	.38** ↻
Numeracy (BNT)	.06	.07	-.01	.02	-.03	-.06	-.04	.07†	-.05	.09†	-.08†
Open-minded Thinking	.15**	.01	.25***	-.17***	-.08†	-.23***	.10*	.10*	-.15**	.18***	-.00
Philosophy Ph.D.?	.01	.06	-.53***	.40***	.17***	-.03	.28***	.04	.16***	.08†	.28***
Age	.03	.05	.07*	-.06	.04	-.02	-.05	.04	.01	.01	-.02
Gender (M = -.5, W = .5)	-.02	-.02	-.00	-.02	.09*	.07*	-.01	-.02	.09*	.03	.03
Extraversion	.00	-.04	-.04	-.02	-.06	.06	-.05	-.05	.05	.08*	-.04
Agreeableness	-.04	-.12**	.04	-.03	.00	.08*	.13***	.02	.05	-.12**	-.04
Conscientiousness	-.04	-.02	-.00	-.04	.02	-.01	.04	-.01	.00	-.03	-.00
Stability	-.02	-.04	.05	-.04	.02	.09*	-.05	.05	.06	-.01	.07†
Openness	-.02	.09*	.02	.11**	.03	-.02	-.01	-.01	.00	.01	.02
Combined Adjusted R^2	.09***	.08***	.32***	.17***	.04***	.18***	.14***	.06***	.06***	.07***	.10***

Note: † $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$

Notes
