Positive Test Strategies and Confirmation Bias in Social Assessment

Janzen, J., Oswald, F., Acreman, R., McCarthy, M., & van de Wetering, S.

UNIVERSITY OF THE FRASER VALLEY

“*Confirmation bias*… connotes the seeking or interpreting of evidence in ways that are partial to existing beliefs, expectations, or a hypothesis at hand.”

Raymond S. Nickerson

Nickerson, R. S. (1998). Confirmation bias: A ubiquitous phenomenon in many guises. *The Review of General Psychology*, 2(2), 175-220.

Hypothesis testing strategies

Positive Test Strategy

- Uses tests to confirm a hypothesis
- Looks for positive evidence
- Useful for building a case

Negative Test Strategy

- Uses tests to disconfirm a hypothesis
- Looks for contradictory evidence
- Useful for challenging a proposition

Hypothesis Testing Research

- Falsification and scientific reasoning
- Two major paradigms:
  - Wason 2-4-6 test (1960)
  - Snyder and Swann (1978)

The Wason 2-4-6 Task

Numbers	Reasons for choice	Conforms	Does not conform
2 – 4 – 6		✓	
4 – 6 – 8	Testing if rule works	✓	
12 – 14 – 16	Testing if rule works	✓	
56 – 58 – 60	Testing if rule works	✓	
100 – 102 – 104	Testing if rule works	✓	
Rule is even numbers ascending by 2: WRONG			

Wason, P. C. (1960). On the failure to eliminate hypotheses in a conceptual task. *Quarterly Journal of Experimental Psychology*, 7(3), 129-140.

The Wason 2-4-6 Task

Numbers	Reasons for choice	Conforms	Does not conform
2 – 4 – 6		✓	
4 – 6 – 8	Testing if rule works	✓	
1 – 3 – 5	Testing if rule works	✓	
1 – 2 – 3	Testing if rule works	✓	
4 – 7 – 12	Testing if rule works	✓	
Rule is any ascending numbers: CORRECT			

Wason, P. C. (1960). On the failure to eliminate hypotheses in a conceptual task. *Quarterly Journal of Experimental Psychology*, 7(3), 129-140.

Responses to 2-4-6 Task

Klayman and Ha

- Both positive and negative strategies pragmatic given context
- Positive tests can demonstrate sufficiency
- Negative tests can demonstrate necessity
- Sufficiency weighted more than necessity

Klayman, J, & Ha, Y.-W. (1987). Confirmation, disconfirmation, and information in hypothesis testing. *Psychological Review*, 94(2), 211-228.

Responses to 2-4-6 Task

Klayman and Ha (Continued)

"[W]hen concrete, task-specific information is lacking, or cognitive demands are high, people rely on the positive test strategy as a general default heuristic."

- Conclusive rule tests rarely possible in real world
- Positive tests more pragmatic default

Klayman, J, & Ha, Y.-W. (1987). Confirmation, disconfirmation, and information in hypothesis testing. *Psychological Review*, 94(2), 211-228.

Responses to 2-4-6 Task

- Improved performance on 2-4-6 task when:
  - Primed or instructed to generate alternatives[1]
  - Primed to use counterfactuals[2]
  - Selecting from pre-generated list[3]
  - Evaluating hypotheses from other people[4]

1 Gale, M., & Ball, J. B. (2009). Exploring the determinants of dual goal facilitation in a rule discovery task. *Thinking & Reasoning*, 15(3), 294-315.

2 Farris, H. H., & Revlin, R. (1989). The discovery process: A counterfactual strategy. *Social Studies of Science*, 19(3), 497-513.

3 Cowley, M. (2015). Hypothesis falsification in the 2-4-6 numbers test: Introducing imaginary counterparts. *Philosophy of Mind eJournal*, 8(41).

4 Adsit, D. J., & London M. (1997). Effects of hypothesis generation on hypothesis testing in rule-discovery tasks. *The Journal of General Psychology*, 124(1), 19-34.

Hypothesis-Testing Processes in Social Interaction

- Snyder and Swann (1978)
  - Participants given list of questions to test hypothesis
  - Asked to determine whether target is an extravert/introvert
  - Asked to select questions from list to test hypothesis
  - Participants selected more confirmatory than disconfirmatory
  - Conclusion: Individuals use positive strategies which may lead to confirmation bias

Snyder, M., & Swann, W. B. J. (1978). Hypothesis-testing processes in social interaction. *Journal of Personality and Social Psychology*, 36(11), 1202-1212.

Hypothesis-Testing Processes in Social Interaction

- Snyder and Swann (1978)
  - 1186+ citations on Google Scholar
  - Multiple text books references
  - Some initial criticism[1], but still widely reported

1 For example, Semin, G. R., & Strack, F. (1980). The plausibility of the implausible: A critique of Snyder and Swann (1978). *European Journal of Social Psychology*, 10, 379-388.

Present study methodology

Partial replication of Snyder and Swann (1978)

Present study methodology

Participants randomly assigned to two conditions

Given blurb on extraversion or introversion

Asked to generate 12 questions to test hypothesis

Participants' answers coded into 5 categories

- Extraversion testing
- Introversion testing
- Unclassified
- Open-Ended
- Double-Barreled

68 undergraduate psychology students from UFV

Mean age = 20.84

59% female

Conditions:
Extraversion Seeking (n=32)
Introversion Seeking (n=36)

Initial interrater reliability 84.54%
After recalibration ~99%

“Extroverts are typically outgoing, sociable, energetic, confident, talkative, and enthusiastic. Generally confident and relaxed in social situations, this type of person rarely has trouble making conversation with others. This type of person makes friends quickly and easily and is usually able to make a favorable impression on others. This type of person is usually seen by others as characteristically warm and friendly.”

Adapted from Snyder and Swann (1978)

Differences from original study

Present

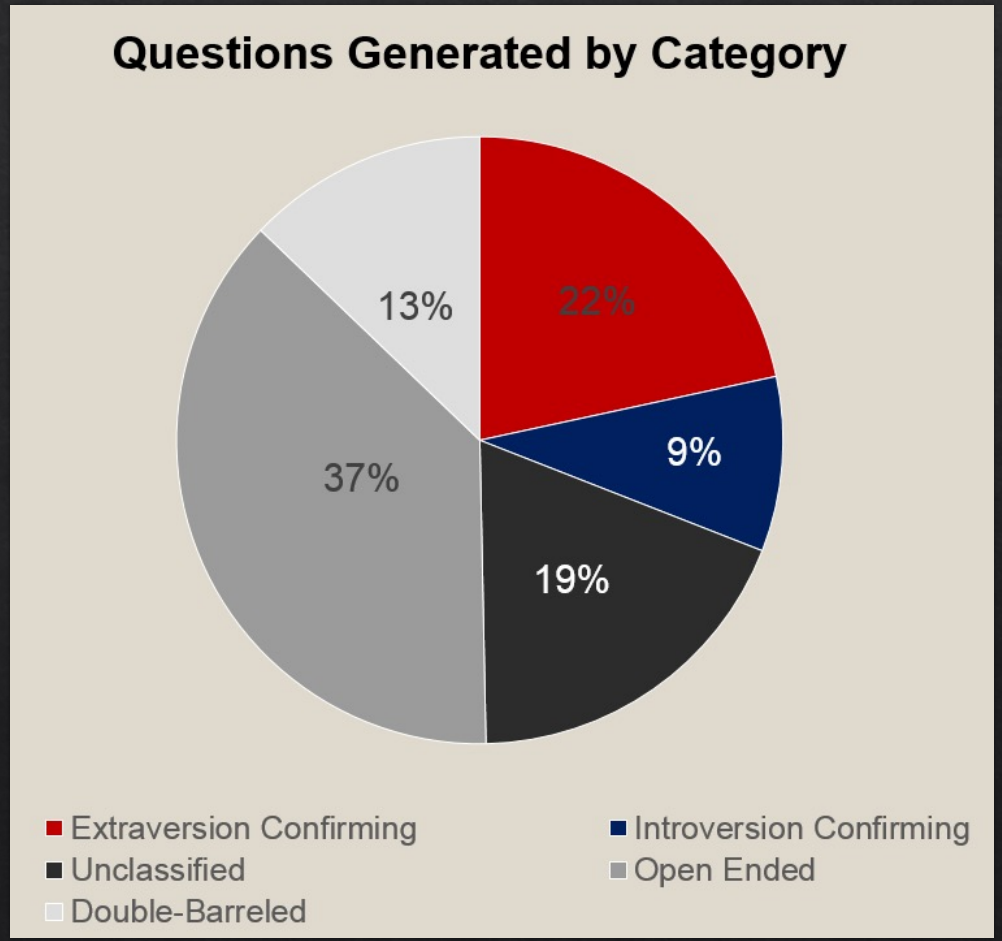
- Participants generated own questions
- Two conditions: extraversion and introversion testing
- Also classified open ended and double-barreled questions

Snyder and Swann (1978)

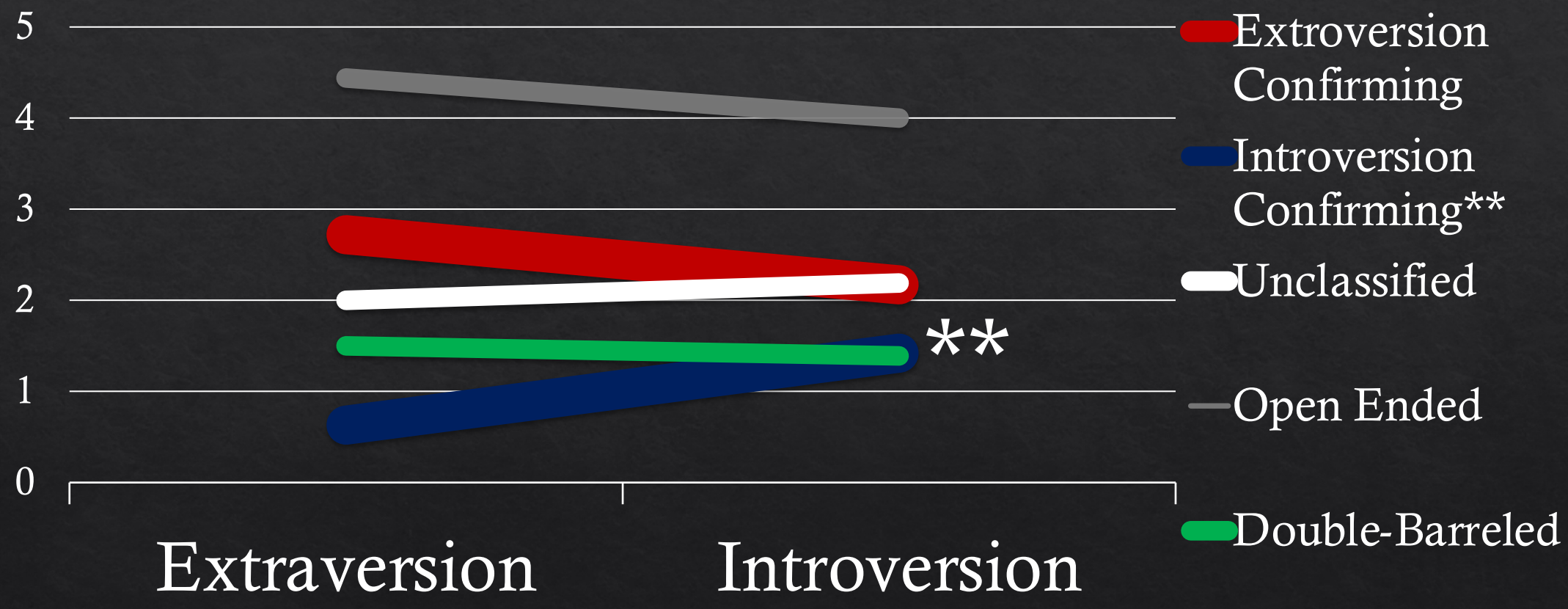
- Participants selected questions from list
- Also included high-certainty and low-certainty conditions
- Only classified positive, negative, and neutral questions

Results

	Extraversion	Introversion
Extraversion Confirming	2.72	2.17
Introversion Confirming	.63**	1.42**
Unclassified	2.00	2.19
Open Ended	4.44	4.00
Double-Barreled	1.50	1.39



Results (continued)



Limitations

- Exploratory pilot study
- Difficult to determine intention
- Difference between artificially planning and real-world
- 20% of questions were neutral or indeterminable

50% of questions were open ended or double-barreled

- Allowing either direction to be tested

Extraversion questions were more frequent than introversion in both conditions

- Even so, averages of 2.72 and 2.17 questions small

Introversion only condition to show significant differences ($p<.05$)

- Effect size small-to-medium ($r=.27$)

Positive questions still leave room for negation

- Mix of positive and negative still ideal

Positive Test Strategy?

Selection vs Generation

- Difference between original and our study
- Selecting hypotheses different than generating
- Improvements on 2-4-6 task when participants given list to test
- A pre-generated list also may imply researchers' intent

Adsit, D. J., & London, M. (1997). Effects of hypothesis generation on hypothesis testing rule discovery tasks. *J Gen Psychol*, 124(1), 19-34.

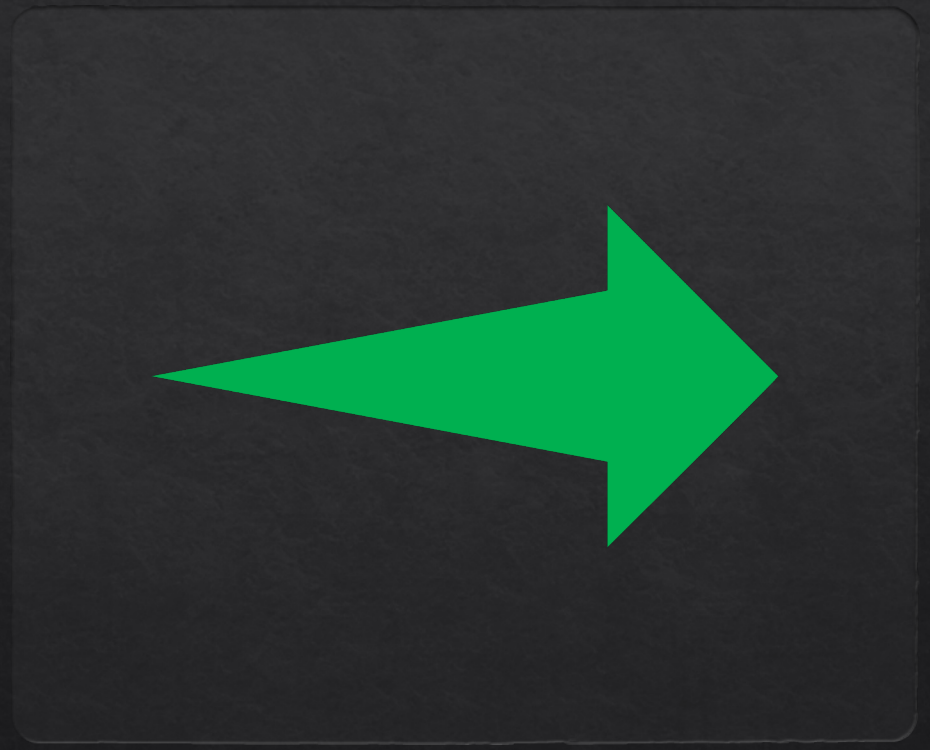
Use of Archetypes

- Many participants designed questions testing other constructs
  - Such as neuroticism and agreeableness
- Poor understanding of personality theory?
- Use of stereotypical archetypes
- Darley and Gross – Stereotypes not as certainties but as hypotheses

Darley, J. M., Gross, P. H. (1983). A hypothesis-confirming bias in labeling effects. *Journal of Personality and Social Psychology*, 44(1), 20-33.

Future Considerations

- More questions than answers
- What to do with original study?
- Future directions



Conclusion

- We did not find similar results to Snyder and Swann (1978)
- Hypothesis testing more dynamic than originally claimed
- Confirmation bias remains an elusive bias to test for

References:

Adsit, D. J., & London M. (1997). Effects of hypothesis generation on hypothesis testing in rule-discovery tasks. *The Journal of General Psychology*, 124(1), 19-34.

Bassok, M., & Trope, Y. (1983). People's strategies for testing hypotheses about another's personality: Confirmatory or diagnostic? *Social Cognition*, 2(3), 199-216.

Cowley, M. (2015). Hypothesis falsification in the 2-4-6 numbers test: Introducing imaginary counterparts. *Philosophy of Mind eJournal*, 8(41).

Dardenne, B., & Leyens, J.-P. (1995). Confirmation bias as a social skill. Personality and Social Psychology Bulletin, 21(11), 1229-1239.

Darley, J. M., Gross, P. H. (1983). A hypothesis-confirming bias in labeling effects. *Journal of Personality and Social* Psychology, 44(1), 20-33.

Devine, P. G., Hirt, E. R., & Gehrke, E. M. (1990). Diagnostic and confirmation strategies in trait hypothesis testing. *Journal of Personality and Social Psychology*, 58(6), 952-963.

Farris, H. H., & Revlin, R. (1989). The discovery process: A counterfactual strategy. *Social Studies of Science*, 19(3), 497-513.

Gale, M., & Ball, J. B. (2009). Exploring the determinants of dual goal facilitation in a rule discovery task. *Thinking & Reasoning*, 15(3), 294-315.

Klayman, J, & Ha, Y.-W. (1987). Confirmation, disconfirmation, and information in hypothesis testing. *Psychological Review*, 94(2), 211-228.

Nickerson, R. S. (1998). Confirmation bias: A ubiquitous phenomenon in many guises. *The Review of General Psychology*, 2(2), 175-220.

Semin, G. R., & Strack, F. (1980). The plausibility of the implausible: A critique of Snyder and Swann (1978). *European Journal of Social Psychology*, 10, 379-388.

Snyder, M., & Swann, W. B. J. (1978). Hypothesis-testing processes in social interaction. *Journal of Personality and Social Psychology*, 36(11), 1202-1212.

Wason, P. C. (1960). On the failure to eliminate hypotheses in a conceptual task. *Quarterly Journal of Experimental Psychology*, 7(3), 129-140.