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Games of What If? A Test of Remote Associations

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Guilford's (1968) discovery of the difference between convergent and divergent thinking abilities was an important milestone in the understanding of human intelligence. There are several types of divergent thinking abilities, one of which is the ability to make remote associations. For instance, the *Consequences* test (Guilford & Guilford, 1980) asks questions such as, "What would happen if people no longer needed to sleep?" Respondents would give some immediate or obvious implications and some implications that were more remote, e.g., consequences of a consequence. From the perspective of producing creative technological advances, a professional would need to make remote associations in order to evaluate the risk/reward value of various ideas, and possibly multiple forecasts for each idea (Mumford, Byrne, & Shipman, 2009; Sternberg & Lubart, 1995). Forecasts might entail identifying possible negative side effects (e.g. of a medicine), revenge effects (Tenner, 1996), in which a plausible solution to a problem actually makes the problem worse, or the disruptive effect on the status quo and the further consequences of that disruption (West & Scafetta, 2010).

Games of What If is a measure of remote associations. It consists of five implausible scenarios to which the respondents give suggestions about what would happen if the initial premise were true. An example item: "What would happen if pigs suddenly developed the ability to talk?" Although the initial cues tended to evoke humorous responses, the objective of the measurement is to assess how well the respondent could think through a complex situation with social implications. The test is timed for five minutes per test item. As with other divergent thinking skills, a substantial amount of the skill is apparent in the number of ideas that a person can generate in a short amount of time.

SCORING PROCEDURE

The score on *What If* is the number of suggestions given that are not redundant or illogically connected to the premise.

- *Step 1*: Read through the responses to a particular test item. Eliminate duplicate answers. Partial sentences are acceptable, so long as the underlying consequence is interpretable.
- *Step 2*: Occasionally a respondent will offer forecasts that have no discernible connection to the item stem. These *non sequitur* responses should be eliminated from the score total, but test scorers should use their judgment as to whether the forecast could be plausible under a bizarre combination of circumstances.
- *Step 3*: Count the number of acceptable responses for the item. Repeat steps 1-3 for items 2-4.
- *Step 4*: The last item is a duplex item in which the respondent identifies a super-human ability and then proceeds to describe what could happen if that ability were widespread. Eliminate duplicate and non sequitur items as before. The remaining responses should be pertinent to the super-human ability.
- *Step 5*: Add up the total number of acceptable responses across the five items.

PSYCHOMETRIC PROPERTIES

The inter-rater reliability of *What If* was .97 ($N = 412$) in a study of the connections among mood disorders, creative output, and emotional intelligence in a sample of undergraduates (Guastello, Guastello, & Hanson, 2004). A principle components analysis, based on data from Guastello et al. (2020; $N = 147$) showed that the five items loaded onto a single component using the criterion of eigenvalue = 1 ($\lambda = 3.40$), accounting for 67.9% of variance. Component loadings ranged from .77 to .86. Cronbach's alpha reliability was .88.

What If was found to be significantly correlated with scores on other divergent thinking measures of ideational fluency (semipartial $r = .37, p < .001$), originality ($r_{sp} = .25, p < .001$), semantic fluency ($r_{sp} = .25, p < .001$), and a personality-based measure of emotional intelligence ($r_{sp} = .09, p < .05$); multiple $R = .63$ (Guastello et al., 2004). It was also correlated with humans' ability to predict some types of chaotic numbers (generated from the Hénon attractor) without computational aids ($R = .26, p < .01$; Guastello et al., 2020). The prediction model contained Social Boldness, a personality variable ($r_{sp} = .20, p < .05$), and What If ($r_{sp} = .17, p < .05$).

TEST NORMS

The available test norms, based on the combined participants in the two foregoing studies appear in Table 1. The norm sample contained 559 undergraduates enrolled in psychology courses at a Midwestern US university. There were 403 females and 153 males in the sample with ages ranging from 18-24 years; 3 participants did not respond to the gender question. The ethnic diversity distribution was 454 Caucasians, 30 Asians, 26 African-Americans, 25 Hispanics, and 24 others.

Table 1. Scores and percentiles for What If ($N = 559$).

Percentile	Score	Percentile	Score
5	24	55	46
10	27	60	48
15	31	65	51
20	33	70	53
25	35	75	55
30	37	80	59
35	39	85	64
40	41	90	68
45	43	95	78
50	45		

The frequency distribution is log-normal with an extended tail toward the right side of the distribution. Minor modes are visible suggesting that subpopulations (of unknown origins) were captured in the sample. The two research samples were substantially different, however (Table 2), even though they came from very similar sources.

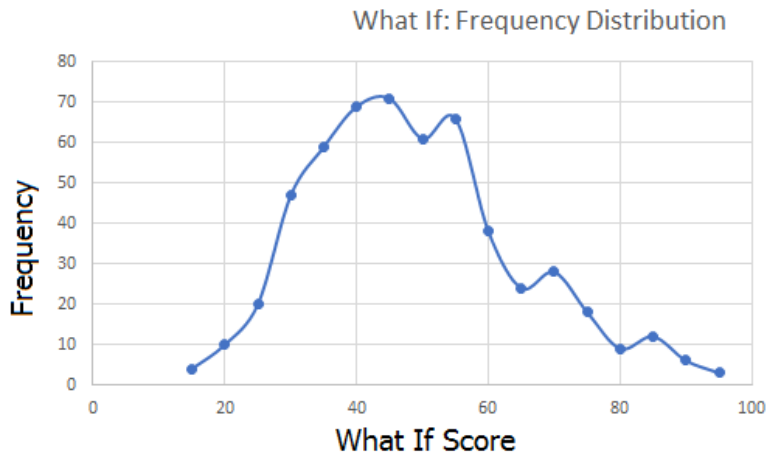


Fig. 1. Frequency Distribution for What If?

Table 2. Comparison of Two Research Samples.

	2004 Sample	2020 Sample
Mean	50.82	35.95
Standard Deviation	16.01	10.48
Median	49.00	34.00
N	412	147

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GAMES OF WHAT IF?

In the next set of exercises you will be given a brief description of a hypothetical situation. Perhaps it will sound (or read) like something straight out of a science fiction movie, a cartoon, or maybe even a nightmare. Who knows?

Your task will be to imagine the implications of possible events that could occur in society if the hypothetical situation suddenly became true. For example:

What would happen if pigs suddenly developed the ability to talk?

Possible responses might be:

- 1. Pigs would go to a central farm to socialize regularly.*
- 2. They might start complaining about their food.*
- 3. They would want radios, TVs, DVD players, and cell phones.*
- 4. People might not want to eat them any longer.*

Be creative and imaginative with your responses. You will have three minutes to respond to each of the five scenarios and write down as many implications as possible. Please wait until the test administrator has the timer ready.

READY ?

SET?

1.What if ...?

People woke up one morning and discovered that the clocks were running backwards?

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____

2. What if ... ?

Sales people everywhere -- in stores, in catalogs, and advertising -- were completely open and honest about the products they were trying to sell?

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____

3. What if ...?

The electricity that we seem to take for granted became unreliable and had to be shut off at unpredictable times?

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____

4. What if ...?

A small percentage of people in society developed the power, when combined with substantial effect, to read the minds of other people?

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____

5. What if ...?

People woke up one day and discovered that they had two new abilities that they did not have before? What might two of those abilities be? (*For purposes of this question, mind-reading and becoming invisible do not count.*)

A. _____ B. _____

Now what would happen if that were true?

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____