Does Priming with a Personality Trait or a Stereotype Influence General Knowledge Test Scores? An Attempt to Replicate the Results of Dijksterhuis and van Knippenberg (1998)

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This study was carried out as a class project under the supervision of Lionel Standing, and was supported in part by the Bishop's University Psychology Department.

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Abstract

This study attempted to replicate the study of Dijksterhuis and van Knippenberg (1998, Experiment 4), who found that priming individuals with intelligence or stupidity, either through traits or stereotypes, influenced their general knowledge performance. It is argued there that priming provokes behavior that is parallel to the perceived concept within the prime itself. Therefore being primed with intelligence will increase test scores on a general knowledge questionnaire, while being primed with stupidity will decrease test scores. The current study found no support for such claims. Being primed with intelligence or stupidity (as either a trait or a stereotype) did not influence students' ($N = 48$) test scores on a general knowledge test. Results are discussed in terms of increasing the prevalence of replication studies as to avoid the acceptance of false information.

Keywords: replication, prime, trait, stereotype, intelligence, stupidity, general knowledge test

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Why is it that completely rational individuals participate in riots after sport matches? Why do these same individuals display extremely different behavior in a classroom setting; why are behaviors adjusted depending on social situations? Dijksterhuis and van Knippenberg (1998) suggest that merely thinking of sport 'hooligans' may lead one to exhibit inappropriate behavior. Similarly, classroom behavior may be more appropriate since the professor may activate representations (i.e., intelligence) in individuals. Thus the mere perception of a person (professor) or group of people (hooligans) may indeed trigger behaviors parallel to that perception.

Dijksterhuis and van Knippenberg (1998) studied this perception-behaviour link. They wanted to find whether or not priming an individual with stereotypes (professor, soccer hooligan) or personality traits (intelligence, stupidity) could alter behavior. The theory behind the claim that priming influences behavior is that the prime itself elicits specific perceptions in individuals and the resulting behavior tends to match these perceptions. Since soccer hooligans are often perceived as stupid (stereotype) and professors as intelligent (stereotype), priming individuals with such stereotypes should provoke intelligent or stupid behavior. It is predicted that scores on a general knowledge test will increase if primed with the professor stereotype and that they will decrease if primed with the hooligan stereotype. The same prediction holds for priming with personality traits directly (intelligence, stupidity).

The results of Dijksterhuis and van Knippenberg (1998) confirmed their predictions. In Experiment 4, for example, when 43 undergraduate students were primed with the professor

stereotype or intelligence trait, their scores of increased on a general knowledge test (20 multiple-choice questions acquired from the game of Trivial Pursuit). When primed with the soccer hooligan stereotype or stupidity trait, test scores decreased by a similar amount.

These findings match what was found in a similar study conducted by Bargh, Chen, and Burrows (1996). Different priming procedures and stereotypes were used, yet results were consistent. It can therefore be said that the activation of a mental representation of a group of people (professors, hooligans) or personality trait (intelligence, stupidity) tends to result in the expression of parallel behavior (intelligent behavior or stupid behavior).

The present study aims to replicate the study of Dijksterhuis and van Knippenberg (1998, Experiment 4). Under similar conditions, it is assumed that the findings will be consistent with this previous study. It is therefore predicted that priming with the stereotypes and personality traits will have an effect on test scores, so that the professor stereotype and intelligence trait primes will increase test scores, and the hooligan stereotype and stupidity trait primes will decrease test scores.

Method

Participants

Forty-eight undergraduate students (27 females, 21 males, M_{age} = 21.44, SD_{age} = 2.15) from Bishop's University were randomly assigned to the cells of 2(direction of prime: intelligent vs. stupid) x 2(target of prime: stereotype vs. trait). 12 subjects received the intelligence trait prime, while 13 received the stupidity trait prime. 10 subjects were primed with the intelligence stereotype (professor) and 13 were primed with the stupidity stereotype (hooligan). Refer to table 1 for the plan of observations. Once all subjects were tested, a name was drawn randomly and that subject received $20.00 for participating in the study.

Materials

All participants were given a set of instructions prior to completing the experiment. They signed consent forms and were randomly assigned to one of the four primes. Once primed, subjects filled out a 20-item general knowledge test (multiple choice format, items acquired from the game of Trivial Pursuit). Examples of items used in this test are "How many rings are there in a five-zone archery target?" and "What are the three colours of the German flag?" Although Dijksterhuis and van Knippenberg (1998) used computers to allocate subjects to one of the four priming conditions, in this study, random number tables were used and subjects completed each step of the experiment using paper and pencils. Debriefing forms were distributed following completion of the study. Refer to appendix A for all materials used.

The primes used were traits (intelligence and stupidity) or stereotypes (professor of hooligan). In the Dijksterhuis & van Knippenberg (1998) study, the "negative" stereotype was soccer hooligans. For the present study, the "negative" stereotype used for priming was football hooligans from homecoming weekend at Bishop's University. It was essential to elicit negative mental representations within each subject. Since soccer is not a highly popularized sport in Canada, we chose to use hooligans at homecoming weekend as a stereotype since the majority of Bishop's students are familiar with the inappropriate behavior that arises during this particular football game.

Procedure

Participants were told they were taking part in a study about perception and behavior. They were each given 5 forms: consent form, instructions, prime, questionnaire, and debriefing form. The prime given to each subject was determined using a random number table. Once the subject had signed the consent form and read the instructions, they were primed. They were given 5

minutes to write down synonyms and behavior characteristic of their prime. Subjects were then given 10 minutes to complete the questionnaire (general knowledge test). Demographics (age, sex) were also recorded. Subjects were thanked and debriefed.

Design

A 2 x 2 between-subjects ANOVA was used to determine whether or not the direction of the prime (intelligent vs. stupid) or the target of the prime (trait vs. stereotype) influenced test scores. The two independent variables are the direction and target of the prime. The dependent variable is the score (number of correct answers) on a general knowledge test (Dijksterhuis & van Knippenberg, 1998). Refer to Table 2 for the test scores as a function of prime.

Results

Descriptive Statistics

The mean score on the general knowledge test for those primed with the intelligence trait (10.00) was 7.1% lower than the mean score for those primed with the stupidity trait (10.77). This goes against the experimental hypothesis. However, those primed with the intelligence stereotype did do slightly better than those primed with the stupidity stereotype (11.20 vs. 10.69), an increase of 4.8%. Refer to Table 2 for the mean test scores as a function of prime.

ANOVA for Direction x Target

Subjects who were primed with intelligence (stereotype or trait) did not score higher than subjects who were primed with stupidity (stereotype or trait), $F(1,44) = .042$, $p = .838$, $h^2 = .042$. Observed power was low however, and this may explain the inability to find an effect. However, the sample size in the current study is larger than that in the Djksterhuis and van Knippenberg (1998) study. It is therefore worrying to note whether or not this effect of priming is spurious. Test scores for subjects primed with traits did not differ from scores for subjects

primed with stereotypes, $F(1,44) = .781$, $p = .382$. There was no interaction between the direction of prime and the target of the prime (intelligence/stupidity x trait/stereotype), $F(1,44) = 1.01$, $p = .32$. Refer to Figure 2 for the scores on the general knowledge test as a function of prime.

Correlations

A correlation matrix revealed that variation in test scores cannot be attributed to any of the factors (direction of prime, target of prime, age, sex). Test scores did not correlate with the direction of prime (intelligent vs. stupid), $r(47) = .043$, $p = .77$. Test scores were not affected by the target of the prime (trait vs. stereotype), $r(47) = .12$, $p = .42$. The age of subjects did not influence test scores, $r(47) = .18$, $p = .22$. Males and females tended to perform equally on the test, $r(47) = -.21$, $p = .16$.

Discussion

Dijksterhuis and van Knippenberg (1998) found that participants primed with intelligence (trait or stereotype) outperformed participants primed with stupidity (trait or stereotype). Participants therefore behaved in line with the activated construct. However, the present study was unable to replicate these results. Although subjects primed with the intelligence stereotype tended to score higher on the test than those primed with the stupidity stereotype, the effect was trivial. Furthermore, those primed with the stupidity trait actually outperformed those primed with the intelligence trait, and by a greater margin than the increase associated with intelligence-stereotype priming.

The ANOVA revealed that no effect of prime: being primed with a trait vs. a stereotype, or intelligence vs. stupidity, did not influence general knowledge test scores. This contradicts previous literature (Dijksterhuis & van Knippenberg, 1998, Bargh et el., 1996). However, Figure

2 shows how for stereotypes subjects performed very slightly better if primed with intelligence. Priming with a stereotype vs. a trait may elicit stronger images and perceptions within the individual, resulting in greater effects on behavior (test performance). Figure 2 also depicts an interaction effect between direction and target of prime. While this effect is not statistically significant, the trend may be that the strength of the effect of priming on test scores may depend on the combination of direction and target: the intelligence stereotype prime results in the highest test scores, while the intelligence trait prime results in the lowest scores.

The procedures followed in this study were not identical to those in the previous studies. Although the items in the questionnaire were obtained from Trivial Pursuit, as in the Dijksterhuis and van Knippenberg (1998) study, the tests were not indistinguishable. The items for the current study's questionnaire were considerably hard. Perhaps it would have been easier to detect an effect if the questions were easier. However, it can be argued that if this effect of prime truly does exist, it should be detectable no matter what the items.

The fact that there were no meaningful correlations found between test scores and all of the experimental factors further demonstrates the inability to identify a priming effect. Taking all of the results into consideration, it can be said that we failed to replicate the study of Dijksterhuis and van Knippenberg (1998). This finding is worrying; if this effect of prime is powerful enough to influence the general population, it should be easily replicated. The magnitude of the effect reported by Dijksterhuis and van Knippenberg is quite large, involving an increase in scores of 26% for the stereotype and trait groups pooled, which was significant at the .02 level, and represented an effect size of .85.

A number of studies have been published in recent years that report significant effects of priming in various situations, yet it is interesting to wonder how many of them can be replicated,

and some negative results are starting to appear, e.g., the unsuccessful attempts by Doyen, Klein, Pichon, and Cleeremans (2012), and Pashler, Harris, and Coburn (2011) to replicate the elderly/walking study of Bargh, Chen, and Burrows' (1996). Replication studies should be priority as to avoid false claims and publications. It is hazardous to provide questionable information to the public, and we are glad to note that replication studies today are rightfully becoming a new movement in science.

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Table 1

Plan of Observations: Number of Subjects in Each Priming Condition

	Direction of Prime	
Target	Intelligence	Stupidity
Stereotype	10	13
Trait	12	13

Table 2

Number of Correct Answers as a Function of Prime

	Direction of Prime			
	Intelligence		Stupidity	
Target	M	SD	M	SD
Stereotype	11.20	1.75	10.69	2.63
Trait	10.00	2.34	10.77	1.83

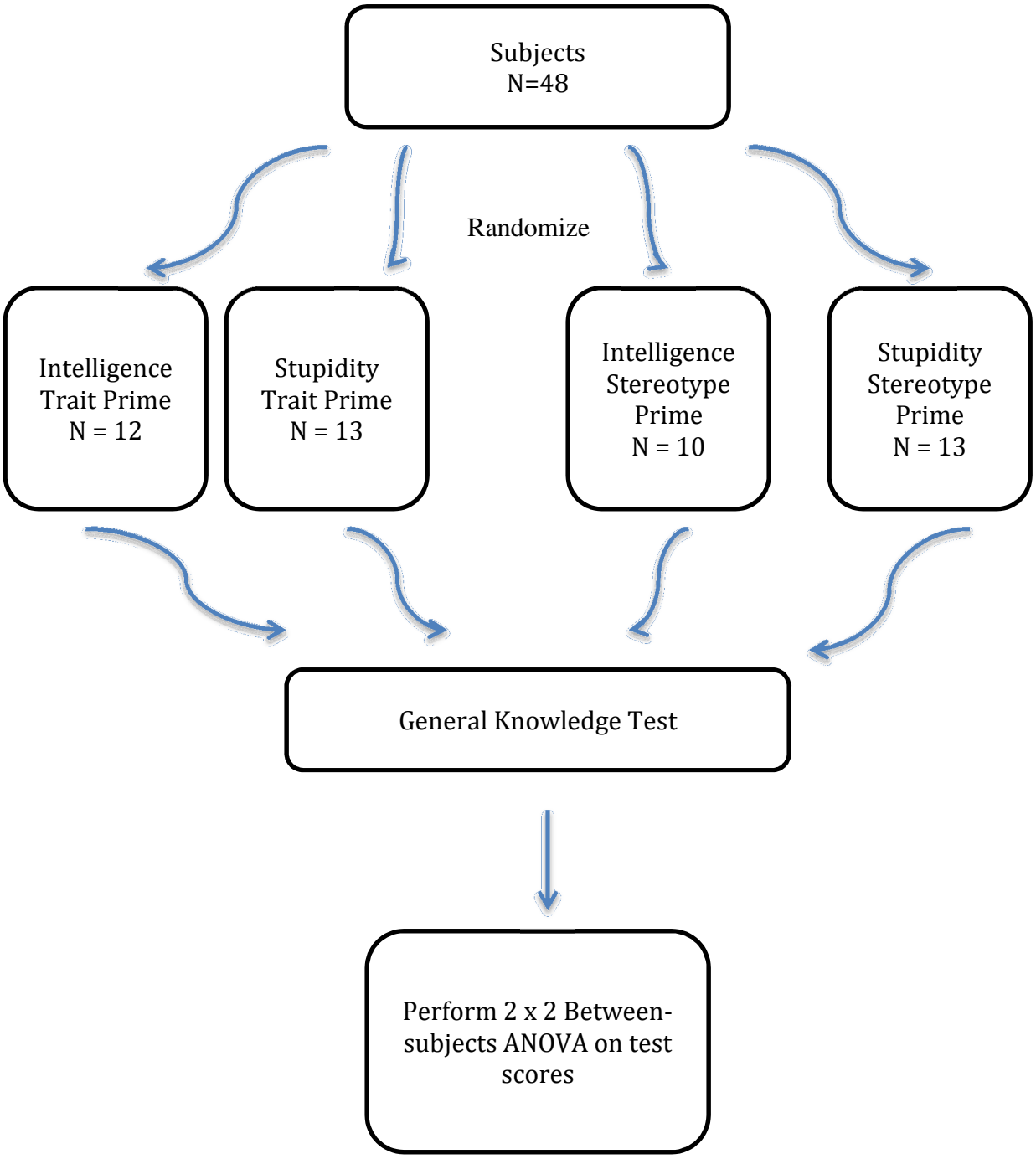

Figure 1. Block Diagram of steps in measuring effect of prime on test score

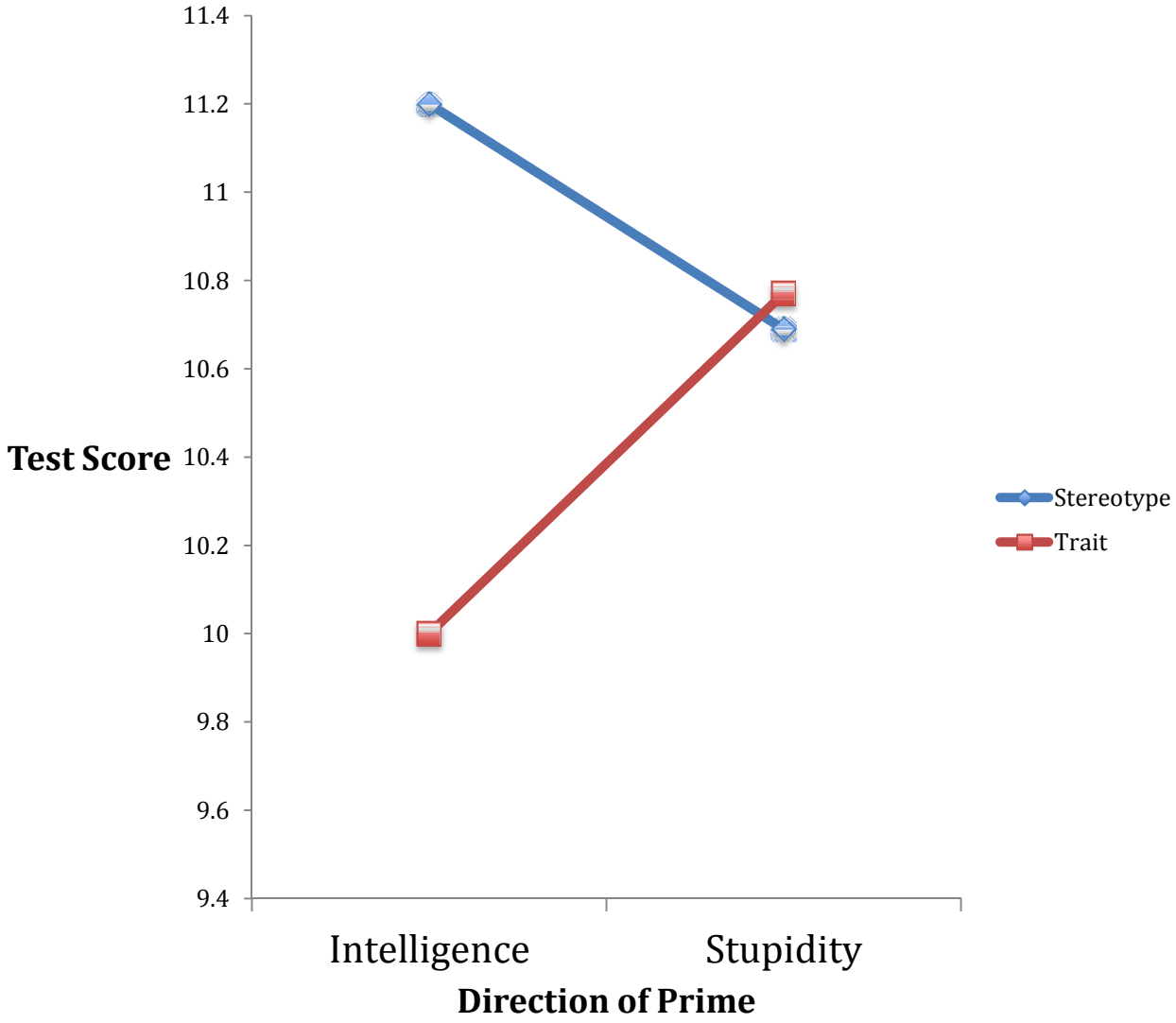

Figure 2. Test scores on the General Knowledge Test as a Function of Prime