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The Neurology of Implicit Self-Esteem: The Relationship between Self-Reported Behavioral Inhibition System and Behavioral Activation System and Implicit Self-Esteem

Weijia Lou

Shanghai Starriver Bilingual School, Shanghai, 201108, China
elena.Lou@qq.com

Abstract: In our study, we measure the correlation between self-reported behavioral inhibition system (BIS) and behavioral activation system (BAS) and implicit self-esteem. Based on reviews of previous studies, we formed two hypotheses. Firstly, people with higher self-reported BAS have higher implicit self-esteem than those who have lower BAS. Secondly, people with higher self-reported BIS have lower implicit self-esteem compared to people who show lower BIS. In addition to just examining the link, we intended to explain implicit self-esteem with biological factors. If our hypothesis can be proved, further research can devote to this area of exploring how a biological approach views implicit self-esteem. We form our study in a passive design, in which participants have to complete two measures: the Name Letter test for implicit self-esteem and the BIS/BAS Scale for self-reported BIS and BAS [3, 8]. The data will be analyzed using Pearson Correlation and be visualized into two scatter plots, each showing the result for one hypothesis. We predicted that there will be a positive correlation between self-reported BAS and implicit self-esteem, and a negative correlation between self-reported BIS and implicit self-esteem.

Keywords: implicit self-esteem, behavioral inhibition system (BIS), behavioral activation system (BAS)

1. Introduction

When people are asked to think about the term self-esteem, one of the first things that pop into their heads is how they evaluate themselves. Most of them may even go on asking the question of "whether I am an awesome man." Few may notice that, beneath the conscious, intentional self-evaluation, there is implicit self-esteem. Implicit self-esteem is defined as the subconscious evaluation of ourselves, which implies that it cannot be measured through straightforward questions [6]. It is more associated with what kind of objects we relate to. For example, if people relate themselves to objects with a positive connotation, they likely think of themselves more positively and thus, have higher implicit self-esteem. On the contrary, if people relate themselves to objects that imply a negative meaning, it can be assumed that they have lower implicit self-esteem.

As a result, due to the difficulty of not being able to measure implicit self-esteem using questionnaires, many past works devoted to examining the perfect measure for implicit self-esteem using the connection between objects and how people think of themselves [2]. Some others studied the cultural differences in implicit self-esteem [1]. Based on these studies, we are now able to use

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have a grander idea of implicit self-esteem and have access to a more systematic measuring system, which are the foundations of our present-day research.

Another main concept explored in this study is the behavioral inhibition system (BIS) and behavioral activation system (BAS). BIS and BAS are two neurological systems that regulate withdrawal and approaching behaviors [4, 5]. BIS controls the withdrawal of behaviors and is sensitive to punishments. BAS, conversely, controls the approach of behaviors and is sensitive to positive reinforcement. Concerning that implicit self-esteem is also affected by social responses, we form the idea that implicit self-esteem may correlate with the activation of BIS and BAS.

2. Present Work

In the present work, we plan to study the correlation between self-reported BIS and BAS and implicit self-esteem. The real significance of this study lies in the link between biological disposition and implicit self-esteem. Since BIS and BAS are two neurological factors, we intended to study how the biological approach may explain implicit self-esteem. Based on the information we know, we formed two hypotheses. Firstly, we believe that people with high self-reported BAS might have higher implicit self-esteem than those with low self-reported BAS. This is because a higher sensitivity in BAS leads to a higher sensitivity to positive social responses, thus leading a person to subconsciously form a positive impression of him or herself, which leads to higher implicit self-esteem. The second hypothesis is that people with high self-reported BIS may have lower implicit-self esteem than those who show lower BIS. This is also due to the effect of negative social responses, which leads people to subconsciously think of themselves negatively.

3. Method

3.1 Participants.

We do a power analysis using the software package G*Power [9] to estimate our sample size. Our primary hypothesis involves using Pearson correlation to analyze the data, and our estimated effect size will be .3. After the calculation, in order to achieve a statistical power of .9, we need at least 112 participants. Finally, 137 individuals respond to our questionnaires, which is greater than the sample size we estimated and needed to produce a valid result. There is no age, gender, or cultural limitation to the participants.

3.2 Passive design

Participants are asked to complete two measurements in this study using electronic questionnaires. The two measurements are included together in a single electronic questionnaire with the Name Letter Test goes first followed by the BIS/BAS Scale. Since there are minimum indications or misleading information in these two tests that may affect the result of the other, we believe that the results will not be affected by the sequence of completing these tests.

The Name Letter Test is targeted to measure participants' implicit self-esteem using the subconscious projection of their attitudes towards themselves onto personal related information, which, in this case, is their name's initials [8]. In this study, participants are asked to rate their liking for the 26 alphabets on a scale of one (don't like) to five (very like). We then analyze the data and see if the difference between participants' favor for the letter of their last name's initial and their average liking towards the other alphabets.

Another measure used using is the BIS/BAS scale [3]. In this test, participants will be provided with statements such as "I worry about making mistakes" and asked to rate how much they agree with this statement on a scale of one to four (one means totally agree, and four means totally disagree).

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There are twenty-four items in total. They are divided into four subscales. Three subscales are devoted to measuring the three aspects of BAS, and the other one measures BIS. There are also four fillers in this measurement that would not be scored in the.

3.3 Data Analytic Approach.

After obtaining the data for the Name Letter Test, we first separate the participants' ratings for their last name initial and then calculate their average liking of the other alphabets. Finally, we subtract the average number from their ratings for their last name's initials and use this final number to represent their implicit self-esteem.

When interpreting the data from the BIS/BAS Scale, we first reverse-scored all the items except items 2 and 22 in our list. Then, we add up the ratings for BIS and BAS separately. Since our study doesn't involve secondary analysis of different aspects of BAS, we simply combined the scores of all the 3 subscales intended to measure BAS. Therefore, we obtain the data that represents the sensitivity of BIS and BAS with the larger the number the more sensitive.

Finally, we will use Pearson Correlation to analyze our data, which allows us to find the linear correlation between self-reported BIS or BAS and implicit self-esteem.

We will visualize our data into two scatter plots, one for each hypothesis. Figure 1 illustrates the result for our first hypothesis, which depicts the correlation between self-reported BAS and implicit self-esteem. Figure 2 represents the result tested for the second hypothesis, which is the correlation between self-reported BIS and implicit self-esteem.

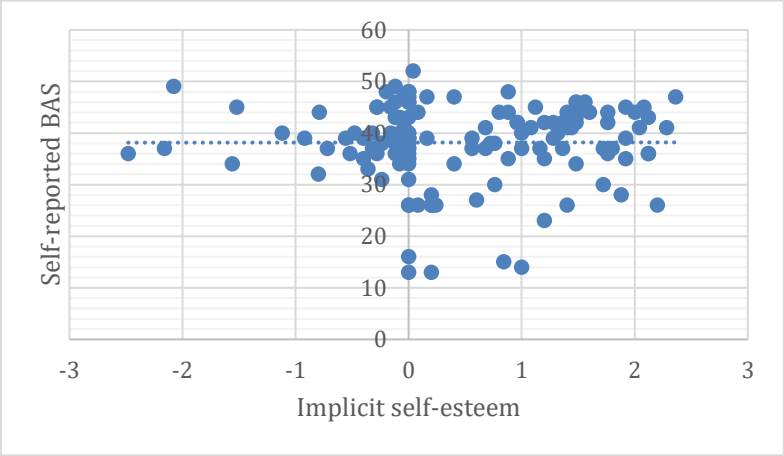

Figure 1: Correlation between Self-Reported BAS and Implicit Self-esteem.

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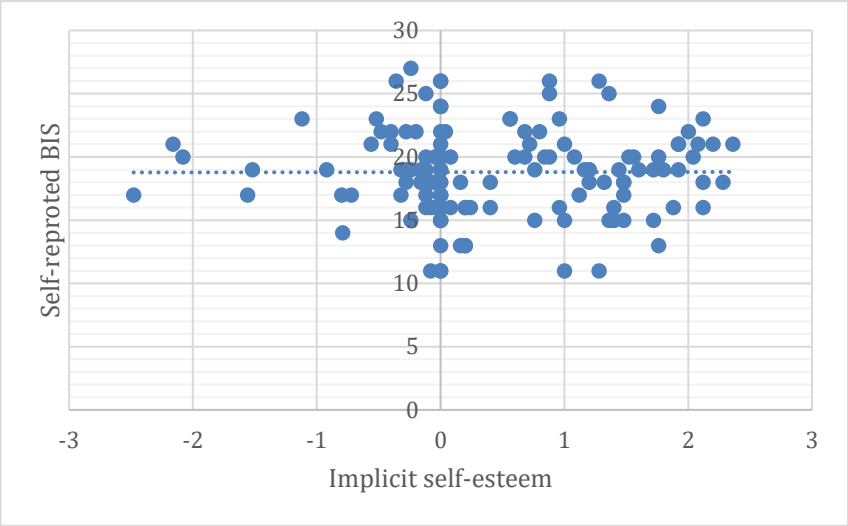

Figure 2: Correlation between Self-Reported BIS and Implicit Self-esteem.

According to the two graphs, both self-reported BAS and self-reported BIS have zero correlation with implicit self-esteem. This means that both our hypotheses are rejected.

4. Conclusion

Our study aims to explore the relationship between self-reported BIS and BAS and implicit self-esteem. Since BIS and BAS are neurological systems, this study is also about trying to use a biological approach to explain implicit self-esteem.

In our present-day work, we use a passive design to explore the correlation between self-reported BIS and BAS and implicit self-esteem. Participants will simply complete two measurements: the Name Letter Test and the BIS/BAS scale. We will then use Pearson Correlation to analyze the data and visualize it into two scatter plots. We expect that there will be a positive correlation between self-reported BAS and implicit self-esteem and a negative correlation between self-reported BIS and implicit self-esteem.

But, according to our collected data in this study, both of our hypotheses are rejected. There are several plausible limitations that may produce this result. One of the most plausible reasons is the effectiveness of the Name Letter Test used in this study for Chinese participants. The Name Letter Test is often targeted at English speakers since they are more sensitive to using letters. For Chinese participants, people are less likely to link letters to their last name and thus themselves. When analyzing the data, we found out that many participants' ratings for all letters are the same. Therefore, their ratings of liking for letters might be based on something else rather than their feelings towards themselves. Thus, the data collected for participants' implicit self-esteem might not be accurate. Moreover, in the Name Letter Test, there is a chance that the mere exposure effect may play a role in the participant's liking of the alphabet [7]. This is a confounding variable that is hard to erase considering the different backgrounds of Chinese participants.

Based on these limitations and the aim of our research, there are plenty of future studies that can be arranged. Firstly, we may try different measurements that are suitable for Chinese participants to measure their implicit self-esteem. Also, we can sort the participants according to age, gender, cultural background, etc. So, even though we may not have enough participants to generalize the result to the whole population, we can conduct a more detailed study that only examines the correlation within a small group. Furthermore, if we want to enforce the link between biology and implicit self-esteem, we can substitute self-reported BIS and BAS with EEG scans that measure the

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actual activation of BIS and BAS systems. Sometimes, self-reported measures lead to subjective and biased data. If we use the objective data of the activation of BIS and BAS generated by brain scans to test our current hypothesis and the results are congruent, the correlation between BIS and BAS and implicit self-esteem can be more consolidated.

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