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Differences in Relational Schemas between Optimism and Pessimism

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Abstract: This paper creates a new approach to studying relational schemas. The idea of our experiment started with an essay called Relational schemas, self-esteem, and the processing of social stimuli, which is written by Erika J. Koch. She mainly talks about the relationships between relational schemas and self-esteem by applying the Lexical Decision Task. According to her idea, we determine a new direction of analyzing relational schemas; that is, what are the relationships between relational schema, optimism, and pessimism? We updated the Lexical Decision Task, so it can fit into the Chinese version of the questionnaires. For the analysis part, this paper is still based on existing computer technology and big data analysis to judge the emotional polarity of sentences.

Keywords: relational schemas, optimism, pessimism, optimistic people, pessimistic people, positive words, negative words, scenarios, Lexical Decision Task

1. Introduction

The direction we choose to work on is the relationship between relational schemas and optimism and pessimism. We wonder if optimistic people have different relational schemas from those who are pessimistic. It seems that optimistic people tend to believe the impacts of bad things are short-lived and can be erased, while pessimistic people deem that the influences of bad things are always there and permanent. Additionally, optimistic people tend to make specific explanations for failure and are willing to learn from it, whereas pessimistic people tend to make ambiguous explanations for failure and try to avoid thinking about it. We also hypothesize that pessimistic people are more likely to have negative relational schemas, which are more likely to combine normal events with negative results and amplify the negative aspects of adverse interpersonal events. To prove our hypotheses, we have the idea to create a new direction for analyzing the relationships in relational schemas, optimistic people, and pessimistic people.

"Relational schemas are networks of information that encompass knowledge of typical interpersonal situations and an individual's thoughts and feelings about those situations. Relational schemas encompass not merely representations of a detached self or other people in isolation but

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instead involve broader representations of self-other relationships that include the self, the other, and the self in relation to the other" [1, 2].

2. Literature Review

After reading the essay Relational Schemas, Self-Esteem, and the Processing of Social Stimuli by Erika Koch, we got interested in the effects of relational schemas. Due to the large difference in the impact of optimism and pessimism on relational schemas, they will be reviewed separately here. In this study, they will be compared with each other and used to analyze the relationship between relational schemas and optimism and pessimism.

3. Optimism & Pessimism

According to the paper Development of the State Optimism Measure written [3], optimism generally refers to generally positive expectations about the future. Optimism has cognitive and emotional components associated with hope, self-efficacy, agency, and well-being. People with optimistic characteristics showed better resilience, social support, coping strategies, self-assessed health, subjective well-being, etc [4]. In psychology, optimism is more of an explanatory style, which exists in the way people explain the causes of events – optimists are likely to see the causes of failures or negative experiences as temporary rather than permanent, local rather than global, and external rather than internal. Such a perspective makes it easier for optimists to see the possibility of change [5].

Conversely, pessimism is a negative psychological attitude that expects bad outcomes in a given situation. Pessimists tend to focus on the negative aspects of life in all areas, get a lot of flak for their negative tendencies, and have a tendency to assume the worst in most situations. Pessimistic people will think that everything is not what we see, there may be more bad results or effects behind it [6].

4. Relational Schemas

The relational schema is an information network that contains knowledge of typical interpersonal situations and an individual's thoughts and feelings about those situations [7]. Relational schemas contain not only representations of the independent self or isolated others, but also the broader self, and other relational representations include the self, the other, and the self in relation to the other [9]. Previous studies have shown that the relational schema constantly appears in people's minds and people tend to process information in a way that confirms their relational schema[7, 8]. The result of Koch's study [7] suggests that people with low self-esteem have lower expectations and are more likely to be aware of rejection of being accepted compared to people with high self-esteem. However, the relational schema of people with optimistic or pessimistic personalities is still barely studied. Hence, this study aims to investigate how optimistic people's relational schema is different from others.

5. Methodology

To examine how relational schemas affect people's thinking under different situations and what are the differences in relational schemas between optimistic people and pessimistic people, our group decided to create three surveys to collect people's thoughts. The format of the three surveys is questionnaires. They focus on relational schemas, optimism or pessimism, and basic information. The first questionnaire aims to find out people's thoughts when facing different situations. There are three types of situations: positive, neutral, and negative. The ideas of measuring people's relational schemas in different situations come from Erika J Koch. In her essay, relational schemas are tested using different spellings of English words. Participants need to decide whether the given word is a

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real word in English [7]. Our group believes her experiment is strong enough to be utilized in our research. However, we are facing a challenge: the participants our group chooses are all Chinese people, but the Chinese language is different from English. They are two different language systems. Chinese do not have word spelling. Instead, we have "Hanzi". "Hanzi" is made of different characters, so it is hard to measure people's different relational schemas by proving them with different spellings of words. Besides, some of them do not master English skills, while others may be possible to misunderstand the details of an English survey even if they can speak English very well. That is why our group chooses to give participants a Chinese version. Based on Koch's experiment, we create a new approach to measuring relational schemas.

In the first questionnaire, we offer participants eight scenarios, two positives, two negatives, and four neutrals. Participants need to choose two emotional words from the word cloud to answer each scenario. The task is to ask participants to choose two emotional words for each scenario and then employ these words to make sentences. The word cloud contains 25 positive words, 25 negative words, and 10 neutral words. All of these words are chosen randomly. The main methods of machine learning are SnowNLP analysis and TF-IDF analysis based on Python. SnowNLP is a class library written in Python, which can easily process Chinese text content, while TF-IDF (Term Frequency-Inverse Document Frequency) is a common weighting technology used in information retrieval and data mining. TF is Term Frequency, IDF is Inverse Document Frequency. According to the conclusions of previous articles on sentiment analysis, the commonly used words that meet the required emotional tendencies are selected and made into word clouds. In our research, we made 10 word clouds with the same words to choose 8 more chaos for the experiment, which could reduce the influence of the location of the words. We are also based on these two Chinese papers to determine emotions in sentences, so we can reduce the subjective factors of experimental results to a great extent.

Additionally, we have time limits when choosing the emotional words, but we do not limit their time to answering scenarios. The purpose of limiting the time of choosing words is that we want participants to choose emotional words unconsciously, so their relational schemas can work well, and then we can examine the influences of relational schemas on people. During the pre-experiment, we choose the duration as 16s for the first two scenarios, 14s for the other 3 scenarios, and 12s for the last 3 scenarios. The sequence of scenes is random to reduce the influence of sequence. The answer to each question comes in the form of a single sentence. The meaning of the sentence and the emotional words used in each scenario can tell us how people behave under the effects of relational schemas.

The second questionnaire is to measure whether participants are optimistic or pessimistic. The scale is based on a paper called Development of the State Optimism Measure written by Millstein and her colleagues [9]. The second questionnaire keeps most of the information from Development of the State Optimism Measure, but we changed the scale from seven choices to six choices. To find out whether people are optimistic or pessimistic, we delete the choice of "neither agree nor disagree" to force participants to make a choice instead of staying in the middle. The criteria of optimism and pessimism are also based on this paper.

The third questionnaire aims to collect basic information from our participants. The survey includes participants' genders, ages, and whether they have experience in studying outside China (more than two months). From the basic information of participants, our group can fit the data into different categories.

6. Analysis

Before we conducted the statistical analysis, we first counted the total number of positive and negative words that people used in the sentences and then calculated the word positivity by using the total

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number of positive words minus the total number of negative words. We also conducted the same procedure for the sentence. The sentence positivity was calculated in the same way— using the number of positive sentences that the participants used minus the number of negative words that participants used. The main difference between our research and the Lexical Decision Task is that this paper utilizes a different language system—Chinese, instead of the English system. The Chinese system makes use of morphemes, that is, one written symbol matches a morpheme. In terms of components of sentences and expressions of emotions, it is much more complex than phonemes in which one written symbol matches a phoneme. In addition to basic judgments, the other judgment of emotional polarity of sentences in this paper mainly obeys the following rules: 1. Focusing on the usage of conjunction and semantic relations between two adjacent words (usually one word locates in the front, and the other locates in the back). Taking 15 different semantic meanings of "而" (this Chinese word means "and" or "but" based on the meaning of contexts) as an example. When the front word and the back word have the same emotional tendencies, this Chinese word shows the sequence of juxtaposed and the semantic relations are the same. In this situation, the word means "and". On the contrary, when the front word and the back word have different emotional tendencies, this Chinese word shows the sequence of turning points, and the semantic relations are different. Under this circumstance, the word means "but". The emotion of sentences after the turning points are more important than the emotion before the turning points and usually emphasizes it [10]. So in our paper, we will weigh the emotions after the turning points higher than those before the turning points. 2. Focusing on the position of the word "不" (this Chinese word means "no"); in the existence of actual meanings, the word "不" before verbs, adjectives, and emotional words can express opposite meanings, while in other positions, the word "不" does not express the actual meanings [11]. Therefore, this paper will pay more attention to sentences containing "不+emotional words" during sentence analysis. 3. Pay close attention to some special rhetorical devices, especially irony. Irony usually expresses much stronger opposite emotions. And the change of words' order will change the emotional focus of sentences [12]. In this way, this paper will adjust the weight of emotions based on these special rhetorical devices contained in each sentence.

7. Results

The optimistic score of participants is calculated by adding scores for 6 state optimistic questions and then dividing by 6. To categorize participants into optimism and normal groups, we performed a median split to classify each participant as either high or not normal in optimism. The main word positivity scores for high and normal optimistic groups are presented in Figure 1. The main sentence positivity score for the two groups is present in Figure 2. As can be seen, both the mean word positivity scores and mean sentence positivity scores are higher for highly optimistic groups. Although the difference between optimistic and normal groups is greater for words than sentences, both scenarios demonstrate a great difference in positivity score.

An independent groups t-test was performed on the mean words positivity soces, which revealed that the difference between highly optimistic and normal groups, was significant, $t(69) = 3.24$, $p = .002$, $d = .78$. A similar independent groups t-test was performed on the sentence positivity, which indicated that there was a significant difference between highly optimistic and normal groups, $t(69) = 2.73$, $p = .008$, $d = .66$.

8. Discussion

The relational schema is a mechanism that guides and regulates how people experience themselves in relationships with other people [8]. People with relational schema in their head actively find the information in the context which confirms their schema. Our results indicated that optimistic people

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are more likely to encode and recall positive information and also have a more positive perspective toward the relationship between themselves and others. Therefore, the relational schema associated with social context is more positive for people with high optimistic scores than for people who are not optimistic.

The present study was designed to investigate different relational schemas of people who are optimistic, neutral, and pessimistic. However, because there are only 71 responses in total, it was not practical to divide responses into three subgroups. Therefore we categorized respondents into two groups – optimism and normal group. We hypothesize that for those who are more optimistic, they are more likely to use positive words and form positive sentences. The result indicated that people with high optimistic scores are significantly more likely to use positive words as well as come up with positive sentences compared to people who are not highly optimistic. This finding confirms our hypothesis.

The analysis means of this paper is based on existing computer technology and big data analysis to judge the emotional polarity of sentences. Currently, the means of analyzing text sentiment based on big data mainly are the dictionary library method, machine learning method, and hybrid method [12]. According to the existing Sentiment dictionary (SentiWordNet, NTUSD, How Net, WordNet, Sentiment Lexicon, Chinese Sentiment Lexicon Ontology), Zhao Yang [13] analyzes deeply about the Sentiment research on Chinese comments through conducting Sentiment analysis on Chinese microblogs on the big data platform. We made conclusions about participants' emotional tendencies of sentences based on the judgment of the corpus' emotional levels by Shao Shanshan et al.[14] and the LDA models made by Peng Mei and Hu Bibo [4] that aims to analyze the data on positive comments and negative comments through the Gensim model.

Though our research creates a new direction for the analysis of relational schemas by associating them with optimism and pessimism, there are still some limitations that are hardly covered by our experiment. 1. The subjects and objects that participants choose to use matter. In order to minimize the conscious thinking of the respondents, the experiment did not restrict the subject and object of the sentences made by the respondents. It means that Chinese participants are able to decide their subjects and objects when making sentences for each scenario. So researchers cannot accurately judge whether participants' pessimism and optimism mainly face themselves or the environment. The hypothesis for this factor is that the different subjects and objects of optimism and pessimism in participants' sentences can reflect the difference in respondents' optimism and pessimism to a certain extent, but it needs to be confirmed in future studies. 2. Different usages of words. Words can be used in positive and negative ways. Owing to the different logic between Chinese and English, Chinese words with positive meanings can be used as negative meanings as well. The phenomenon is the invertion of words' meanings. That means words with positive meanings can be expressed in an opposite meaning in the sentences. The situation takes place in the responses we collected from our participants. Although it is not the main focus of this paper, we preliminarily assume that the invertion of words' meanings can show much more intense emotions in Chinese. 5. The limited number of participants. Because of the limited resources, researchers collect data by posting links to questionnaires on social networks. This may cause some biases because most of the participants will be researchers' acquaintances. The results are possible to be affected in this situation. In future studies, the biases can be addressed by increasing the diversity of participants and collecting more data to reduce the influences.

9. Conclusion

According to the result we get, people with optimism tend to encode and recall positive information, as well as have more positive perspectives on their relationships with others. In this way, the relational schema associated with social context is more positive for people with high optimistic scores than for

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people who are not optimistic. Though we make conclusions about people with optimism, we cannot fully conclude the results from people with pessimism. The reason is lacking resources, such as technology. Thus, if possible, our group will continue to study people with pessimism and how they view their relationships with others. Besides, the limitations that are covered in our study will be eliminated if we choose to work further.

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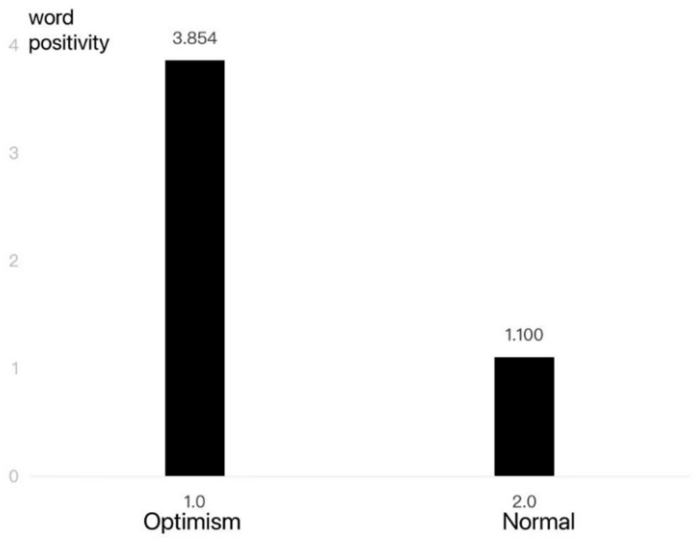

Figure 1 Mean Words Positivity Score as a Function of Optimistic Group

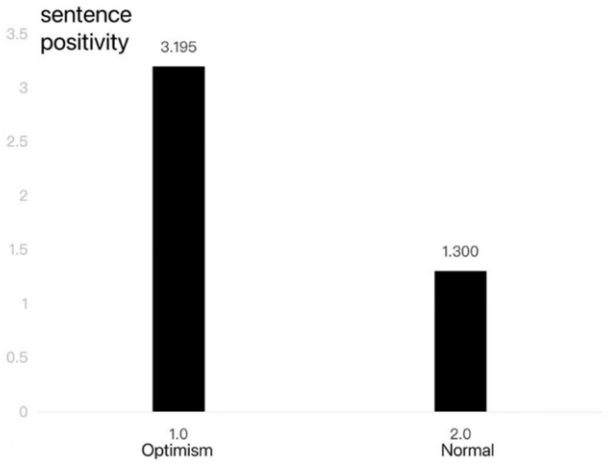

Figure 2 Mean Sentences Positivity Score as a Function of Optimistic Group

Appendix

The specific content of our survey (we conduct our study in Chinese, but we translate the survey in order to benefit readers). Here is the English version of our survey: https://union.qualtrics.com/jfe/form/SV_51mbZdOFYojJfaS. Here is the Chinese version of our survey: https://union.qualtrics.com/jfe/form/SV_3jAAzd0fX2AesRg.

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The Word Cloud picture used in the survey is shown below: