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Experimental Study on the Notability of Social Cognitive Components on the Amount of Cognitive Dissonance

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Abstract: This study theoretically analyzes and experimentally researches the mental processes for the forming of the impression on social cognitive and the mental processes for attitude changes; this study proposes Ash's two hypotheses, persuasion model of attitude change and cognitive dissonance theory and through two designed experiments, it carries out data analysis for the mental processes for the forming of the impression and the mental processes for attitude changes. Studies have shown that: different adjectives have different effects on the effects of impression formation; the importance corresponding to different consistent cognitive components has bigger effect on the amount of cognitive dissonance which is roughly inverse relationship; the more the amount of cognitive dissonance is, the higher the extent on the attitude change is and vice versa.

Key words: Impression formation, attitude change, psychology experiment, data analysis, notability

INTRODUCTION

Thomas and Znamecki defined social psychology as "the science which studies attitudes" in 1918, Asch took interest in social perception before he was interested in herd behavior in 1946, after World War II, with the rise of cognitive psychology and the concerns about the various social problems after the war, researchers were eager to tap the inner causes of a variety of social phenomena, therefore, social cognition was beyond the interpersonal influence, became a major branch of social psychology.

Social cognition is the basis of the formation and change of human's social motivation systems and social emotional motivation system, the research on this issue appeared in the early 20th century, when someone put forwards corresponding research methods, with the development of science and technology and data processing capabilities, the research and analysis on the psychological experiments also had higher credibility. For the design of the research and psychological experiment on social cognition, a lot of people made efforts, it is these people's efforts that makes social cognitive psychology get a better analysis and some scholars put forward their views, in which: Chen (2002) researches the effects of cognitive psychology on teaching, draws the conclusion that students should pay attention to understanding the rules of language, focuses on comprehensively training students' actual capacity to use the language; Chen (1995) extracts the information of short-term memory, discloses the rules of short-term memory, discusses the history and researches on the information of short-term memory, analyzes the various modes of the extracted

short-term memory information, points out the theory meaning and its limitations, puts forward the ideological design about profound research and extraction of short-term memory information through the application of cognitive psychology.

Based on previous studies, this study analyzes the mental processes for the forming of the impression on social cognitive and the mental processes for attitude changes and researches the psychological processes in social cognition through the analysis of experimental design and experimental data, in order to provide an idea for the improvement and development of cognitive psychology.

THEORY ON SOCIAL COGNITIVE PSYCHOLOGY

Social cognition usually refers to people's integrated processing towards various social stimuli, Social cognition is the basis of the formation and change of human's social motivation systems and social emotional motivation system, including social perception and social attitudes and so on. For social perception, this study studies the formed psychology through impression and for social attitudes, this study studies the formed psychology through r attitude change.

Psychologies formed through impression: In social perception, the most important thing is the impression on people, Asch noted, "we see a person, we will immediately form an impression related to his character, a glimpse, a few words are enough to make us have a very general understanding for a complex life". Impression, this kind of

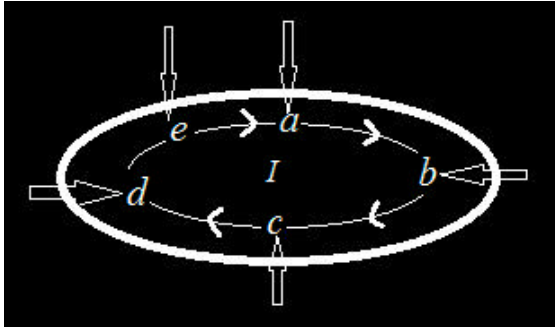


Fig. 1: Plan of the impression formation from the second assumption

social perception style, an intermediary link that social context will have an effect on individual behavior, so the research on the psychology formed through impression is necessary.

Asch put forward two assumptions on impression forming, the first assumption thinks that impression forming is the result that several features are simply added, there is no correlation between each feature, if represent people’s five features, I signifies people’s impression, then the first assumption satisfies the Eq. 1:

$$a+b+c+d+e = 1 \tag{1}$$

The second assumption thinks that the features in human personality are correlated and generated after the way that the impression produces fully integrates these features and the fusion characteristic is shown in Fig. 1.

If the impression formation is described as the first assumption, each feature has the same effect, there is certainly no core feature which has influence and can guide other features while various features in the second assumption are related and combined that is, the importance of each feature in the process of impression formation is different, there is core feature and less important margin feature, from more intuitive point of view, the second assumption is close to reality, so this study will experimentally verify the second assumption.

Psychology of attitude change: Due to the fact the attitude is also the intermediary ache of social condition’s effect on personal activities, the social condition is not able to arise people’s attitude at any time, so attitude is closely related to conduct and attitude change is also an important aspect of social cognition research. In the social psychology, the attitude change is one formed by one person, after receiving information effect and the attitude

has changed. There are Holland’s persuasion model and Fastener’s cognition maladjustment theories in the psychological research related to attitude change.

The persuasion model refers to the model by which attitude and conduct of people are directed toward to the expected direction through a certain appeal. The persuasion can be regarded as an information exchange process and this model is made up of four factors as follows: communicator, communication itself, receiver and communication condition, respectively, among which the receiver is the most important information resources whose professionalism, authority, reliability and attractiveness will all make effect of attitude change changed. Measurement of this factor can be done by positive direction and negative direction; communication itself mainly refers to the method by which the information is transferred and during communication, the arrangement and selection of information, emotional feature of information, unilateral or bilateral presentation of information and transfer channel of information will change the effect of persuasion and the persuasion effect of this factor is different between unilateral and bilateral presentation of information to the receiver and can be measured by information presentation method by different receivers; the receiver refers to the persuasion subject and personal feature and feature of mind have big effect on persuasion effect and the presentation method of this factor can be measured by the feeling of receiver; the communication condition refers to the fact that during communication, the communicator and the receiver are not independent and they communicate based on certain background condition which has certain effect on persuasion effect. The factor to embody background condition is warning degree and distraction degree and when the warning degree is relatively high, the receiver is not easy to change his or her attitude, whereas, when the distraction degree is high, the receiver is easy to be persuaded. We can use the psychological protection degree to embody communication condition (Zhang, 2013).

if we use α_1 to represent directional degree and α_2 to represent the degree of presentation, α_3 to represent the feeling of the receiver, α_4 to represent the psychological protection degree, T to represent the time of attitude change, the following function is made:

$$T = f(\alpha_1, \alpha_2, \alpha_3, \alpha_4) \tag{2}$$

The Eq. 2 is an uncertain function, but the change trend between the persuasion time and various variables is shown as Fig. 2.

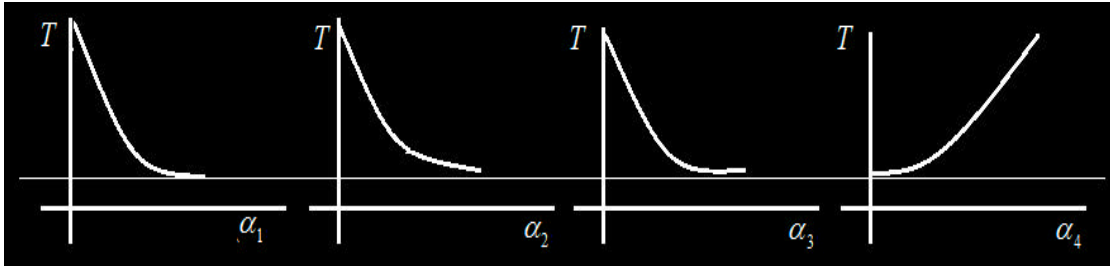


Fig. 2: Persuasion time-trend diagram of factor

In theory, cognitive dissonance can occur between beliefs, between belief and behavior or between behaviors. But in the actual research process, the dissonance involved mostly is the dissonance between the belief elements and the behavioral elements. When people can not change their behaviors, they have to change their attitudes which is a form of attitude change. Festinger thinks that the more serious the individual cognitive dissonance, the greater the range of the attitude and view changes.

EXPERIMENTAL ANALYSIS OF SOCIAL COGNITIVE PSYCHOLOGY

Psychological experimental analysis of the impression formation: The psychological experiment of the impression formation is composed of two sub-experiments. The experimental subjects that participate in the experiment are college students, who are divided into group A and group B.

For the first sub-experiment, 90 students form group A are selected and 76 students form group B are selected. The experiment content is to ask the receivers from the two groups to listen carefully to a group of adjectives describing people's traits of character and then form some kind of impression about the describer. The receivers from group A and group B, respectively hear the words as follows:

Group A: Intelligent, diligent, determined, enthusiastic, smart, cautious, realistic

Group B: Intelligent, diligent, determined, hardhearted, smart, cautious, realistic

Only one adjective of group A is different from another adjective of group B, namely, enthusiastic and hardhearted. According to the content heard by the receivers, the adjectives about the impression about the person described shall be selected from 18 pairs of adjective antonyms shown in Table 1.

Table 1: Eighteen pairs of adjective antonyms that describe impression

No.	Phrase	No.	Phrase
1	Magnanimous-narrow-minded	2	Shrewd-intelligent
3	Sad-happy	4	Grumpy-gentle
5	Humorous-old-fashioned	6	Sociable-farouche
7	Popular-undesirable	8	Trustless-reliable
9	Important-unimportant	10	Ruthless-merciful
11	Attractive-unattractive	12	Strong-minded-weak-minded
13	Frivolous-conscientious	14	Cautious-talkative
15	Selfish-altruistic	16	Imaginative-pragmatic
17	Strong-weak	18	Dishonest-honest

The content of the second sub-experiment was slightly altered on the basis of the first sub-experiment. Similarly, the tested subjects were divided into two groups and the difference was that the people of group A was decreased to 20 persons from the original 90 persons and in group B, the people was decreased to 26 persons from the original 76 persons. The adjectives that the subjects heard were shown below:

Group A: Smart, diligent, firm, polite, skilful, prudent, realistic

Group B: Smart, diligent, firm, rude, skilful, prudent, realistic

Among the above words, also only one adjective was different which was polite and rude. And the subjects were also required to choose an adjective that could best describe the individual impressions on the person who was described in Table 1.

Through the above two sub-experiments, we could verify the impact extent that the passionate and polite person who was described to the subjects' impressions. By the computational method of Eq. 3, we graded the 18 groups of adjectives on the corresponding groups:

$$\text{Score}(i) = \frac{n_i}{N} \times 100 \quad (3)$$

In Eq. 3, Score (i) showed that the score of the i commendatory adjective in Table 1, n_i indicated that the

Table 2: Two sub-experiments group score list

No.	Adjective	No.1 sub-experiment		No.2 sub-experiment	
		Group A	Group B	Group A	Group B
1	Generous	91	8	56	58
2	Smart	65	25	30	38
3	Happy	90	34	75	65
4	Sweet-tempered	94	17	87	56
5	Humorous	77	13	71	48
6	Sociable	91	38	71	48
7	Popular	84	28	84	68
8	Reliable	94	99	95	100
9	Important	88	99	94	96
10	Merciful	86	31	59	77
11	Attractive	77	69	93	79
12	Inner-directed	100	97	100	100
13	Earnest	100	99	100	100
14	Rigorous	77	89	82	77
15	Altruistic	69	18	29	46
16	Imaginative	51	19	30	31
17	Strong	98	95	100	100
18	Honest	98	94	87	100

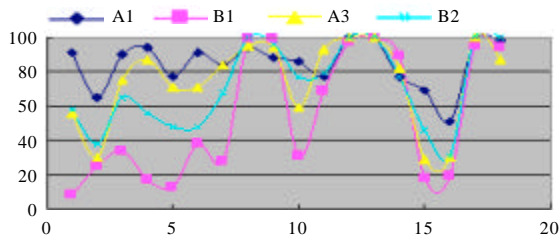


Fig. 3: Distribution of scores in each group

number of subjects who chose the *i* commendatory adjective, *N* showed that the total subjects on the corresponding group, Table 2 showed the score of each group on the two sub-experiments.

Distribution of scores in each group is shown by Fig. 3 below: As it is showed in Fig. 3, we could know that the scores of A1 and A2 are obviously superior to B1 and B2, there is obvious difference between A1 and B1, but the difference between A2 and B2 is very slight, so it can be seen that compare with polite and rude, passionate and hard-hearted have more pronounced differences on formation of expressions.

Experimental analysis on attitude changes mentality:
Subjects: 71 junior boys who study Introduction to Psychology.

Experiment content: The subjects are required to take out bobbins from a tray which is filled with 12 bobbins with one hand and put them on desk and then put them back to the tray. Do it over and over, record the subjects' response speed with a stopwatch and take away the tray half an hour later and ask the subjects to conduct another

task that a board with 48 splines is given to each subject and let them rotate 90 degrees in clockwise and repeat it for half an hour. When the two above tasks are completed, the subjects would be randomly divided into three groups. Make one group as the control group while the other two groups are the experimental groups, the experimental groups would be marked as Group A and Group B and then take the control group into the first room, Group A into the second room and Group B into the third room. The control group is mandated to pass the information to new subjects: "The experiment is very interesting, I get happy from it, I'm very happy and it's very exciting"; while the task of Group A is also to pass this information to the new subjects, but they will get paid \$ 1; the task of Group B is also to pass the same information to the new subjects, but they will get \$ 20.

If M_0 represents cognitive dissonance and N represents discordant cognitive component, accordant cognitive component is represented by P , discordant importance is represented by I_N , I_Y represents accordant importance. Then the relationships among these five factors meet the Eq. 4:

$$M = \frac{N \times I_N}{P \times I_Y} \tag{4}$$

If we suppose that the importance of the discordant component (I am an honest person) in Group A and B is both 5, the importance of accordant component (I get the pay) in Group A is 1, the importance of accordant component (I get the pay) in Group B is 20, then according to Eq. 4, we could get the relation which is shown in Eq. 5:

$$M_A = \frac{N \times 5}{P \times 1} > M_B = \frac{N \times 5}{P \times 20} \tag{5}$$

From Eq. 5, we could know that the maladjustment of Group A is larger than that of Group B and therefore, the degree of the attitude change of Group A is larger than that of Group B.

Carry out interview of attitudes to control group and the two experimental groups, respectively and then we could get the average assessed value of each interview project which is shown in Table 3.

Through the data that show in Table 3: The real feelings of the experimental variables on experimental tasks appeared profound difference among the interview questions to the three groups of subjects, relative to the subjects of Group B who received \$ 20, the subjects of Group A preferred the experimental task. Therefore, the result also verified the theory in Eq. 5.

Table 3: Average value of interview topics of three experiment groups

Interview content and score range	Control group	Group A	Group B
Interesting degree score range (-5,+5)	-0.45	+1.35	-0.05
Achievement degree score range (0, 10)	3.08	2.80	3.15
Scientific value degree score range (0, 10)	5.60	6.45	5.18
Desire for re-attend the experiment score range (-5, +5)	-0.62	+1.20	-0.25

The cognitive dissonance of the subjects in Group A who showed more interest on the experiment mainly comes from the following four kind of cognition:

- They did attend a boring experiment
- They did tell the new subjects that the experiment was very interesting
- They did get a \$ 1 pay
- The self-identification that I am an honest person

Through analysis of the above four cognitive conditions, we could know that the second and the third cognition have been the facts, they couldn't be changed, but the interviewees still wanted to maintain the self-image which was showed in the fourth cognition, so they could only change the attitude which was showed in the first cognition. But to the Group B that gained \$ 20, the subjects could take the payment as the good reason for lie, so that they didn't show any big change on the attitude changes. The data is the Fig.3 could verify this fact.

CONCLUSION

This study is written in the aim of research to socio-cognitive psychology, summed up the psychological study theory of impression formation and

attitude change and put forward the Asch hypothesis, convince model theory and cognitive dissonance theory; in this study, through psychological experiment analysis of impression formation, we could come to a conclusion that different adjectives affected different on impression formation which verified the difference on the impression scores of the subjects between passionate, hard-hearted and polite, rude; through the experimental analysis of attitude changes mentality, the reason for the formation of cognitive dissonance was obtained that the degree of influence on cognitive component which corresponds to the importance on attitude change verified the correctness of the theory that under different compensation situations, the degree of attitude change of lie.

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