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Cognitive Processes of Verbal Reporting on the Choice Blindness

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Sometimes we are unaware of our cognitive processes. We are unaware of the stimuli that are influencing our choice behaviors in daily simple decision tasks. How do we choose among different stimuli that one is better than another in everyday settings? Do we know what we want when we make such choices?

In this chapter, I will discuss the reason why we make postdictive introspection. Human can observe own mind and report it. But sometimes, the contents of introspection are not reliable. What make distort our introspection?

I. Verbal Report in the Choice Blindness

We reported one of the famous phenomenon as “*Choice blindness*” in CARLS vol.4 (2011). It refers to a person’s failure to detect a mismatch between one’s intentions and the outcome of one’s choices in a decision task, without their notice. In previous studies, Johanson and his colleagues showed participants pictures of various pairs of stimuli including pairs of patterns, and female faces, or tasted jams, and teas (Johansson, Hall, Sikström, & Olsson, 2005; Hall, Johansson, Tärning, Sikström, & Deutgen, 2010). Participants were asked to judge which member of a given pair was

more attractive. On some trials, the experimenter switched the outcome of the participant's choices such that the outcome was the opposite the participant's intended choice. It turns out that participants failed notice the mismatches between their intended choices and presented outcomes. Moreover, they reported introspective reasons for the choices they had made for the manipulated pictures that they did not choose. This seemingly mysterious phenomenon, called "*Choice blindness*", is a failure on the participant's part to detect a mismatch between his or her intentions and the outcome of actions in a decision task.

What might explain the fact that we can choose x, and then not notice when are given y instead? Do we not actually know what we want at the moment we make a choice?

Not only were the participants in previous choice-blindness experiments blind to the manipulation of their choices, they also offered introspective reasons for preferring the false alternative they were given.

Johansson and his colleagues analyzed the collection of introspective verbal reports (Johansson, Hall, Sikström, Tärning, Lind, 2006). Two major methods have been used in the comparative analyses of the verbal reports. Based on relevant research, such as automatic lie-detection and language development, a large number of variables were compared for reports what derived from manipulated condition with what from non-manipulated condition. Of the total 30 variables measured for these reports, only two variables statistically differentiated manipulated from non-manipulated reports. First, in latent semantic analyses, the contextual usage of words in a large corpus, a "semantic space" is constructed representing the relative distance between words in the corpus. Although Johansson et al's semantic analyses, found no difference between manipulated and non-manipulated reports, they did reveal large discrepancies between male and female participants. Both latent semantic analyses and several linguistic frequency variables distinguished male from female reports.

If there are no or few differences between manipulated and non-manipulated reports, and we know that the manipulated reports, at least to some extent, are confabulatory, then this might indicate that the same mechanism is responsible for both types of reports. In this roundabout way, it can be argued that the problem in finding differences between manipulated and non-manipulated reports is due to the fact that they are *both* confabulatory.

We introduced our previous study in CARLS vol.4 (2011). In this study, we used western pictures to clarify the issue of verbal reports and postdiction. Because due to the nature of stimuli used in previous studies (faces, tastes etc.), it was difficult to determine which factors in the pictures might have been influential to the participant's choice. For example, if a verbal report is "pretty nose" or the "nice hair cut" These painting stimuli are useful in that they can be examined to ascertain if a specific feature within a given painting was mentioned in participants' explanations of their choice. In our experiment, the features of a given painting are unique to the picture, such as the presence of a curtain, the vividness of color or the season and so on. This makes it possible to clearly identify a feature change. our primary interest was to examine *postdictive* explanations. All of the subjects who were asked to give reasons for their reported choices even if these involved the switched paintings. The verbal reports were also recorded and analyzed.

The content of the verbal report for the manipulated condition was classified 3 types. In the manipulated condition, a verbal report was classified as transfer when stimulus described in verbal report was congruent with what was presented while first judgment (Transfer). In this case, participants mentioned features what based on their original preference. If the stimulus described in verbal report was incongruent what was presented while judgment, then the verbal description were classified as Retrospective. In this case, explanation is *postdictive*, which means that it does not represent original reasons for the choice that occurred when participants had judged the picture during the trial. The other description, in which the object was not clear in explanation, was classified as "Unclear."

Results indicated a very low level of concurrent detection. Only 11% of the pairs that were switched were detected concurrently. However, all participants who were asked to why they chosen the picture could report the reason. There were both postdictive and memory transfer report. All of the subjects who were asked to give reasons for their reported choices even if these involved the switched paintings. The contents of report were classified postdiction and memory transfer.

These results allowed inferences about reasons for choice blindness. The reasons become clear with an examination of those features mentioned by participants when asked to explain their choices. For example, a participant

who originally chose a landscape figure that depicted a lake in the summer or spring, nonetheless agreed that chosen a switched painting containing a lake in the snow. That is, he failed to detect the change. However, when asked why he chose the latter painting, this participant responded "...because I like winter, ...because I like snow,...so I chose this one".

In this study, we showed that our introspection is not always reliable.

II. Report of Introspection in Animal

On the other hand, in animal studies recently, it is hot topic that if the animal have introspection, and if they can report it. Many studies showed that animals are able to observe their mental state, such as uncertainly, and use it to escape more risky condition (Fujita, 2010; Smith, Schull, Strote, McGee, Egnor, & Erb, 1995; Smith, Shields, Schull, & Washburn 1997; Washburn, Smith & Shields, 2006; Sole, Shettleworth, & Bennett; 2003). The data suggest that animal can observe their introspection and they can report it. For example, in the Smith's study, monkeys were presented three object; box, S, and star (Smith et al., 1997). Participants were asked whether the random dot in the box was dense or sparse. If dense, choosing the box is correct and if sparse, choosing the S is correct. Incorrect responses earned a time-out, so that monkeys could not do the task. The Star response cleared the screen and initiated a guaranteed win trial. So, it make escape from risky incorrect response. In this task, humans escaped selectively the difficult trials that left them uncertain of the stimulus. They search their levels of uncertainly and escape risky condition. Two monkeys also showed the same pattern. The data suggest that escapes by monkeys are interesting cognitive analogs and may reflect controlled decisional processes prompted by the perceptual ambiguity.

On the other hand, some of the human studies showed that human introspection is not always reliable. What characters do the introspection in human have? Why is our introspection not always reliable?

III. Distortion of Introspection in Human

In the one of the most famous paper of introspection, Nisbett said that there may be little or no direct introspective access to higher order cognitive processes. In this paper, they said that subjects are sometimes: (a) unaware of the existence of a stimulus that importantly influenced a response, (b) unaware of the existence of the response, and (c) unaware that the stimulus has affected the response (Nisbett & Wilson, 1977).

For example, I will show you the cognitive dissonance study. In this study, the group of participants recruited to an outdoor survival training course (Zimbardo et al, 1969). To survive outdoors, prepare and eat grasshoppers was explained to the participants. Half of them were instructed by a nice and warm person, the other half were given an angry and hostile instructor. After the “eating” was done, the group with a non pleasant instructor liked the taste better than the other group. A few even took extra grasshoppers home to share with their friends and families! In this experiment, the content is the preference of taste of grasshopper. This preference was affected by instructor’s personality. According to the cognitive dissonance theory, participants with a nice instructor reduced their dissonance, but the other participants could not find a sufficient justification for why they ate those disgusting grasshoppers, so they changed their attitude towards liking them instead. But none of the participants reported instructor’s personality as cognitive process.

In the next case, under the pretence of a consumer survey, people walking by in a shopping centre were invited to evaluate articles of clothing (Nisbett & Wilsson, 1977). The participants were asked to indicate which one of four identical pairs of nylon stockings they preferred. There was a pronounced left-to-right position effect, such that the right-most object in the array was heavily overchosen. In contrast to this, none of the participants mentioned position as having a possible influence on their choice;

In the blindsight study, some blindsight subjects have no awareness whatever the stimuli are, but yet are able to predict, at levels significantly above chance, aspects of a visual stimulus (Stoerig & Cowey, 1997). For example, in the case of patient D.B., he could succeed in a variety of discriminations, such as X versus O, square versus diamond, and square versus

rectangle in his blind field, even though he said he did not “see” them (Weiskrantz, 1986). In the interview after a series of experiments, he was told how well he had done.

Experimenter: Did you know how well you had done?

D.B.: No. I didn't — because I couldn't see anything; I couldn't see a darn thing.

Experimenter: Can you say how you guessed — what it was that allowed you to say whether it was vertical or horizontal?

D.B.: No. I could not because I didn't see anything; I just don't know.

Experimenter: So you really did not know you were getting them right?

D.B.: No.

There are many other psychological phenomena that show our unawareness of our cognitive process: Subliminal Perception, Mere Exposure Effect, Priming and so on. Nisbet and Wilson said that we may have no direct access to higher order mental processes such as those involved in evaluation, judgment, problem solving, and the initiation of behavior (Nisbett & Wilsson, 1977).

Then, if you asked to explain your cognitive process that you cannot observe, your report of process will be distorted. Next, I will show you the cases of distortion of process report

Split-brain is a term to describe the result when the corpus callosum connecting the two hemispheres of the brain is severed (Gazzaniga, 2000). In the split-brain study, a patient with a split brain, when shown an image in his or her left visual field will be unable to vocally name what he or she has seen. But the person can pick up and show recognition of an object with their left hand. This is because the speech-control center is in the left side of the brain in most people, and the image from the left visual field is sent only to the right side of the brain. Since communication between the two sides of the brain is inhibited, the patient cannot name what the right side of the brain is seeing. But the person can pick up and show recognition of an object with their left hand, since that hand is controlled by the right hemisphere of the brain.

In some cases, patient with split brain confabulate. Patient P.S. was presented a series of commands to the right or left visual field and asked to act in response to verbal commands. P.S. was able to act presented to either

visual field but could describe verbally only to the right visual field stimuli. When P.S. was asked about command presented to the left visual field, the subject could not explain cognitive process and confabulated. For example, when “laugh” was presented, P. S. started to laughing, when asked “Why are you doing that?” the subject said “Oh, you guys are really something”. In this case, the process was confabulated (Gazzaniga, & Ledoux, 1978).

Let’s return to the position effect that I introduced before (Nisbett & Wilsson, 1977). In this study, there was a pronounced position effect. In contrast to this, none of the participants mentioned position. Instead, they commented on the quality or texture of the fabric. Actually, those 4 were identical. In this case too, the process report is distorted.

IV. What is the Introspection

As you seen sofar, human introspection is not always reliable. What is the difference between human and animal introspection?

Introspection is the examination or observation of one’s own mental and cognitive process that is thought, desire, sensation, decision, retrieval..., and observed contents. We can observe our thoughts, subjective experience, and we can report it. My question is what the difference between the introspection of humans and animals is.

To clear this problem, it is necessary to divide the introspection two phases; *Cognitive process* and *Cognitive content*. Cognitive content is the response, answer, what is retrieval, the result of decision, yes or no for the question. Cognitive process is the way to the cognitive contents, underlying the answer. If you participate in memory recognition task, you will be asked that “which one did you seen?”, then you search memory and find the answer. Your mental process of memory search is cognitive process and the answer is cognitive content. And the introspection is observation of these total cognitions. But we cannot observe all these cognition. We can observe only the content. We cannot always observe the process. I divide the report of introspection as two: *report of cognitive process* and *report of cognitive content*.

I think the studies of animal introspection discuss about this report of content. Animal can report their cognitive content such as uncertainty of

perception. One of the most important reasons why only the report of content is discussed in animal is because animal cannot have the way to describe the cognitive process. Humans have the way. We do report the reason verbally why we chose the answer. But we cannot always observe the process. So, the reports of process tend to be false. It is the difference between animal and human.

In previous studies that showed the distortion of human introspection, human participants could observe their cognitive contents, but not cognitive processes. When they were made to explain the reason forcibly, they would confabulate postdictive.

My suggestion is that if these reports in a manipulated condition are confabulations, then the reports of non-manipulated conditions and even if our daily reports may be confabulatory.

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