



DEPARTMENT OF PSYCHOLOGY

**Choice blindness as a
new tool to study preference change.**

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Abstract

Recent research has shown that we might not be as aware of our choices as we believe ourselves to be – a phenomenon called *choice blindness* (Johansson et al, 2005). In this thesis I replicate and extend these results by showing that choice blindness can be used to unconsciously influence preferences. An experiment with four conditions was conducted. In all conditions, participants were shown two series of pictures of female faces, and were instructed to point to the one they found the most attractive. On some pairs they were also instructed to verbalize the reason behind their choice. Unknown to the participants on certain trial a card trick was used to covertly exchange one face for the other. In the second condition an extended verbal report was required. In the third condition a verbal report and an attractiveness rating was required. Finally, the fourth condition was a combination of condition two and three. The results showed (i) that in the card trick trials the participants often failed to notice the mismatch between their intended choice and the manipulated outcome, and (ii) that the outcome of the mismatched trials exerted a strong influence on the second choices made by the participants, and (iii) that this effect was moderated by the type and amount of feedback provided in the manipulated trials.

Keywords: choice blindness, preference, decision-making

Introduction

In the formation of our preferences, we can be very much influenced by the example of others. We copy our parents and peers, we take after those we think know better, or the people that are just better known. When Penelope Cruz bats her L’Oreal-thick eyelashes and says: “because I am worth it!” we think we are worth it as well. We often want what other people want, and we do what other people do. But a seldom asked question is how the feedback from our actions influences our future preferences. Do we come to like what we choose as much as choosing what we like? Here, I introduce a novel way of approaching this question by examining what happens when people are forced to react to the outcome of choices they did not intend to make.

In a recent series of studies, it has been shown that people sometimes might fail to notice dramatic changes to the outcome of our choices. Johansson, Hall, Sikström & Olsson (2005) showed that people are sometimes blind to the manipulation of the outcome of their choices. In this study, participants were shown pairs of pictures of female faces and were asked to choose which face in each pair they found the most attractive. However, unknown to the participants, on certain trials, a double-card ploy was used to covertly exchange one face for the other. Thus, on these trials, the outcome of the choice became the opposite of what they intended. The striking result was that in most trials the participants did not discover this mismatch and accepted the choice as their own, an effect called *choice blindness*. In Hall, Johansson, Tärning, Deutgen and Sikström (in progress) the same discovery was made, i.e. that people often are blind to the outcome of their choice, but in addition to this, the effect was demonstrated in the modality of taste and smell. But not only are people willing to accept a manipulated outcome as their own they are also prone to give confabulatory reasons for why they have chosen the way they do. As Johansson, Hall, Sikström, Tärning and Lind (2006) have found these explanations can be both detailed and vivid and there are very few differences between the verbal reports given in the manipulated and the non manipulated trials.

This effect is remarkable in itself, both that people do not notice and that they are willing to give reasons for their choices. But here I want to address the question “and then what

happens?” Are we as influenced by choices we did not intend to make as by choices we actually made and can false feedback influence people to that degree that they change their preferences?

Background

The general idea that people influence themselves through their own actions is far from new. One of the first to introduce this notion was William James, who argued that our emotions are a response to our bodily changes. We register the things that go on in our bodies and from this we experience different emotions. According to James, it is not the case that we first feel afraid of the bear, and then run, but rather the opposite. He argued that we feel afraid because we are running. Likewise we get angry because we strike, feel sorry because we cry, and so on. It is the perception of our selves that makes us behave and feel in a certain way (James, 1884). William James was among the first to explore the dynamical interactions between bodily reactions and conscious judgment in the formation of emotions and attitudes, but several others have taken up and further explored this idea.

Festinger cognitive dissonance theory

According to Festinger (1957), people are sometimes faced with situations where they will experience what he calls *cognitive dissonance*. By this he means that individuals sometimes experience the tension that comes from holding two conflicting thoughts at the same time or two conflicting “cognitions” as he calls it. When Festinger talks about cognitions he means any element of knowledge, including attitude, emotion, belief or behavior. Contradicting cognitions is something we human beings strive to “escape” and in order to do so people change what they can control, their attitudes, and thereby also reducing the amount of conflict between these cognitions (Festinger, 1957).

Festinger conducted a range of experiments through which he wanted to investigate to what extent a person’s behavior or that person’s actual attitude or beliefs is a function of the behavior he or she is engaged in. In a now classical experiment by Festinger and Carlsmith (1959) sixty participants, each assigned to one of three different conditions, were asked to take part in a long, tedious and meaningless task. In one condition the

participants were given one dollar to tell the next waiting participant that the task was really enjoyable and fun and in another condition the participants performed the same task but received 20 dollars in order to tell the same thing. In the control condition the participants were not paid or asked to say anything. At the end of the experiment each participant were asked to indicate how much they had enjoyed it. The results showed that the participants in the one dollar condition experienced the laboratory task as more enjoyable than the other two conditions (Harmon-Jones, Brehm, 1996).

According to the dissonance theory the result is due to the fact that from the beginning each participant thinks of the task as dull and boring, i.e. they hold a cognition about the task as dull, but they also know that they have described the task as fun and enjoyable, a conflict that produces the dissonance. For the participants in the one dollar condition, their behavior of talking about the task as fun, is neither explained by their cognition about the task (that they really think is that the task is dull), nor is it explained by the small amount of money they receive as a gift, so, in order to make their cognitions agree they change their cognition about the task so it matches their behavior. In this way we are influencing the way we behave and act (Festinger, 1957 in Bem 1972).

Bem; self – perception theory

Another way of looking at how we influence ourselves into different actions is through Bem's self-perception theory (1972) "Individuals come to "know" their own attitudes, emotions, and other internal states partially by inferring them from observations of their own overt behavior and/or the circumstances in which this behavior occurs. Thus, to the extent that internal cues are weak, ambiguous, or uninterpretable, the individual is functionally in the same position as an outside observer, an observer who must necessarily rely upon those same external cues to infer the individual's inner states" (p.2).

By looking at the Festinger-Carlsmith study again it is possible to compare the two theories. Festinger concluded that the participants in the one dollar condition evaluated the laboratory task as more fun than the other conditions because they had to change their feelings about the task in order to match the feelings with their behavior. But according to

Bem's self-perception theory explains the reason why the participants in the one dollar condition evaluated the task as more fun was because they observed their own behavior. They heard themselves telling the next participant that the task was fun and from this they concluded that their feelings about the task must be that it actually was fun. Bem claims that the participants think that their feelings cannot have anything to do with the one dollar since just a dollar cannot be a major motivating factor. Therefore it must be that the participants think that what they are telling the next participant reflects in fact their true feelings about the task.

Already in the 1960's researchers showed how an individual's self-attribution can be influenced by giving him or her false feedback. For example in one experiment Valins and Ray (1967; in Bem 1972) let people with phobia for snakes look at pictures of different snakes and at the same time they were also given false feedback about their heartbeat. The heartbeat was designed to imply that they were not afraid of the snakes by making the participants believe that they had a lower heartbeat than they in fact did. Results showed that after the experiment the participants who had received the false feedback could approach a real snake more closely than control subjects whom had heard their own real heartbeat throughout the experiment.

Other research has focused on the possibilities of forcing people to change their point of view without them knowing it. In for example studies on forced compliance the research is focused on the attitude change that follows from a participant having to execute a behavior which goes against their personal attitudes, e.g. for example writing an essay holding a positive viewpoint when you in fact believe the opposite (Joule, 1991).

Research on forced compliance has shown that people can change attitudes and beliefs to the contrary of what they believed from the beginning. Leippe and Eisenstadt (1994) explored white Americans prejudices against black Americans and whether it was possible to change these prejudices or not. They let white American participants write essays in favour for a new scholarship policy that would benefit black students at some expense to white students. There were different conditions for writing the essay, some

participant were told that they had no choice but to write the essay in favour of this new policy (low choice) and the others were told that they could choose themselves if they wanted to write it or not (high choice). The results showed that in both conditions attitudes and general beliefs about black Americans became more favourable. Even though not all in the high choice condition wrote essays in total favour for the new policy their general beliefs about blacks became more favourable. This shows that it is possible to change people's preferences, at least to some extent.

Memory research

More modern experiments have also shown that it is possible to make people accept false feedback as a part of their own memory. Loftus and Hoffman (1989) describe a true story about a man who happened to be witness to a robbery while shopping in a hardware store. In addition to the money the robber also took a hammer and a calculator just before he left. Before the police came the witness talked to one of the other customers who claimed that she had seen the robber take a calculator and a screwdriver. When the police later questioned the first witness he could describe the robbery in detail but when asked if the robber had taken a hammer or a screwdriver he said screwdriver. This is a typical example of how misinformation can be interpreted as being a persons own memory. There are other alternative explanations as well, for example it is possible that the man in fact never saw the hammer and just trusted what the other witness had told him, but the important thing is that it in fact is possible to affect people and their memories.

Preference research

Even though there is not yet so much knowledge about how our preferences are constructed and formed some researchers have shown that it is possible to influence and change peoples preferences (Field, 2006, Bernstein, Laney, Morris & Loftus, 2005).

Bernstein et al (2005) made participants in an experiment believe that they had had negative experiences with strawberry ice-cream as children. The participants had to fill in a questionnaire from which the experimenter later generated a false profile. This profile described for example how the participants had fallen ill when eating strawberry ice-cream in their early childhood. The participants were later asked what food they would

eat when offered, and they then reported that it was less likely that they would have taken of the dessert with which they had had a negative experience. Thus, planted false beliefs about strawberry ice-cream led to the consequences that the participants later on avoided it.

There are also other ways of changing or creating a preference in people. In Field (2006) he claims that it is possible to change children's preferences through classical conditioning. The formation of preferences was done by showing different types of new cartoons to children. Some cartoons were paired with a food the children disliked (Brussels sprouts), and some cartoons with liked food (ice-cream). The results showed that preferences for the cartoons that were paired with the liked food increased whereas preferences for the cartoons paired with disliked food decreased.

To summarize, there is evidence suggesting that we might influence ourselves through our actions and our interpretations of them. There are also experiments showing that false feedback can lead to false memories about parts of an event or for a whole event. Classical conditioning experiments as well as counter attitudinal experiments have also shown that it is possible to change a person's preference without the participant's knowledge. But the present study is the first to examine the effect of choices we did not intend to make. It also differs from the type of memory research presented above, as in this experiment the participants are actually making a choice. That is the participants are actively choosing the outcome and are in that way more involved in the experiment. Compared to counter attitudinal studies this study also differs in the way that here people are not openly forced to advocate the opposite of their actual intentions. The participants are also not aware of, as in the counter attitudinal studies, that they are for example writing an essay contradicting what they really believe.

Johansson et al, 2005 showed that we are not always so aware of our choices and the outcome of them, and it was established that mismatches between intention and outcome sometimes occur without us noticing. This thesis explores what happens over time, if these mismatches only survive the moment or if they influence our preferences over

time? The choice blindness paradigm was used to study if people's preferences can be influenced by manipulation and if different types of feedback affect the preferences to different extents. More specifically the thing of interest was exploring whether the feedback from the manipulated choices might change the preferences of our participants over time.

In order to explore the stability of preferences one experiment with four different conditions were conducted. All conditions followed the basic structure of that of Johansson et al (2005) with the important change that all pairs were shown twice, thereby adding a second choice to the experiment. The first condition consisted of the first and the second choice, but the second condition differed in that way that it also included attractiveness ratings of both pictures in each pair. In the third condition each participant were encouraged to talk about the picture for one minute, and in the fourth condition the participants had to talk for one minute but they also did the attractiveness ratings as in condition three.

Depending on condition different results were expected. The amount of feedback the participants would get i.e. depending on verbalization and attractiveness rating, different consistency in the preferences was expected. With consistency I here mean the consistency between the first and the second choice.

Hypothesis one: People's preferences should be more stable in the non manipulated trials compared to manipulated ones.

Hypothesis two: The longer the participants had to verbalize their reasons for a picture the less consistent they should be, in the manipulated trials, with their original choice i.e. the picture they actually prefer.

Hypothesis three: In the manipulated trials fewer participants should rate their original choice higher than the not preferred picture.

Method

Participants

There were 80 participants (48 females), twenty in each of the four conditions, with a mean age of 24 sd 4.17.

Materials

Fifteen pairs of grey-scale pictures of female faces were used as stimuli. The pictures were taken in a café on campus, and all were pictures of students. With respect to picture quality, 30 pictures were chosen to be paired up with one another. The pairing was done by visual inspection by the experimenter. The pictures were taken with a white wall as background and were then processed in Photoshop by standardizing the faces to 7.5 cm width and 9.3 cm height. Red cardboard was then glued onto the background of each picture.

Before the experiment the pictures were rated for attractiveness by 17 volunteers on a scale from 1 to 10 (1 = not at all attractive and 10 = very attractive). Out of the 15 pairs 6 were chosen as pairs where choices were to be verbally reported. The verbal report pairs were chosen so that the attractiveness ratings covered a range from moderately different to strongly. Copies were made of the six verbal report pairs (twelve faces) but instead of gluing red cardboard to these they were glued onto a black laminate plate.

Procedure

All conditions followed the same procedure with minor additions in condition two, three and four.

Condition one: Change blindness plus verbal reports

The participants were shown 15 pairs of pictures of female faces. Six of these 15 pairs were verbal report pairs and out of these six pairs three were manipulated for each trial. All pairs were shown in a randomized order for each participant. In order to make the participant feel familiar and secure with the experiment and with the procedure no manipulations took place among the first five pairs. Instead the verbal report pairs were

placed in a randomized order in the following ten pairs, however two manipulated pairs were not shown in a row. Each pair was shown for 4 seconds. The participants were instructed to, when shown a pair of faces, point at the face they found the most attractive. Both pictures were laid down on the desk pad with faces downwards. The chosen face was slid to the participant in order for him/her to look at it. After just looking or in some trials also talking about or rating the picture the participants were asked to put the picture (facing upwards) in a small box next to them.

The manipulation was done with help from a card trick using a technique called black art. This technique uses the fact that it is possible to hide black things with a black background. The manipulation was performed by using the double cards, where the visible faces had the black laminate background (which blends in with the black desk pad) and behind these ones where their pair contrasts (with red cardboard background). So, when the pairs are laid down the red card is clearly visible whereas the presented card is masked by the top card. When the participant points to the one he or she finds the most attractive the top card (with the red background) is slid to the participant who picks it up. The other card, their original choice, is at the same time slid into a box in the experimenters lap. So, in the manipulated trials the one picture the participants hold in their hand is not the one they actually preferred.



Fig. 1. A snapshot sequence of the choice procedure during a manipulation trial. **(A)** Participants are shown two pictures of female faces and asked to choose which one they find most attractive. Unknown to the participants, a second card depicting the opposite face is concealed behind the visible alternatives. **(B)** Participants indicate their choice by pointing at the face they prefer the most. **(C)** The experimenter flips down the pictures and slides the hidden picture over to the participants, covering the previously shown picture with the sleeve of his moving arm. **(D)** Participants pick up the picture and are immediately asked to explain why they chose the way they did

After the 15 pairs had been presented, all pairs were shown a second time, again in a randomized order. In the second round no manipulations took place and the participants did neither have to verbalize nor rank the preferred picture. In all other aspects the second presentation was identical to the first presentation.

After the second round the participants were asked what they thought of the experiment in general and if they found it stressful. They were also encouraged to say if they thought about anything else, if they thought something was strange or if they had some other reflections of the experiment. Some participants indicated that they had felt that

something was strange with the pictures. These participants were asked to look through all pictures again in order to see if they could pick out the manipulated ones. The participants who did not mention that anything was strange were told about what had happen in the manipulated trials. If someone then claimed that they in fact had thought about this, i.e. that some pictures were switched, they were also asked to look through all pictures again. All participants were told about the manipulations in the ending and for those who wanted to see how it was done the experimenter showed the trick. Informed consent was obtained from all participants, those trials, to which the participant gave his/hers consent, was also recorded.

Condition two: Change blindness plus extra verbal reports

Everything was identical to condition one except that the verbal reports were extended. Instead of just stating why they preferred a certain picture all participants were encouraged to talk about the picture for one minute. As usual the participant was first asked to state the reason behind their choice. The experimenter encouraged the less talkative participants to describe their reasons and to describe what they saw while looking at the picture. If the participants still had troubles talking, the experimenter encouraged them to say what they thought about specific features such as the pictures nose, eyes, mouth and hair. All questions were not necessary for all participants, instead these were used as a help for those participants having trouble verbalizing their reasons. Following this extra verbal report, the experimenter continued to the next trial at the first appropriate opportunity, i.e., without interrupting the conversation

After the pairs had been shown the first time the same procedure followed as in condition one.

Condition three: Change blindness plus attractiveness rating

The same material was used as in the first condition. The procedure was nearly the same as in the first condition except that a rating of the verbal report pairs was done. As before the participants were asked to state why they had chosen the way they did, as in condition one. But after this verbal report the participants also had to rate how attractive they found

the picture in their hand on a scale from 1 to 10. The scale used was the same as for the “prerating”, 1 = not at all attractive to 10 = very attractive. After rating the preferred picture the experimenter showed the other one and asked the participant how attractive he or she found this other one. As before all pictures were shown two times, this second time no manipulations took place and no questions or ratings were asked for. When all pairs had been shown twice all six verbal report pairs were shown a third time, this was done in order for the participants to rate the verbal report pictures again. This second time the rating looked a bit different, this time each face was rated one at a time and were not as in the first rating shown in pairs. The faces were shown in a randomized order.

After the second ranking the same brief questioning time took place.

Condition four: Change blindness, extra verbal reports plus attractiveness rating

The last condition was a combination of condition two and three, the same procedure was used as in all the above conditions but an extended verbal report was encouraged and also ratings of the verbal report pairs. So, when the participant held the preferred picture in his/hers hand they were encouraged to talk about it for about one minute and thereafter also rate both pictures, first the chosen one and thereafter the not chosen one.

Just like in previous conditions the pairs were shown a second time with no manipulations, questions or rating taking place. Afterwards the same debriefing session took place.

Results

Detected trials were removed from the analysis and were divided into four different categories, *concurrent*, *retrospective*, *possible retrospective* and finally *after rating*. Participants who discovered the manipulation immediately were included in the concurrent category. In the debriefing session we asked if the participants had any comments or if they thought anything was strange with the experiment. Some subjects mentioned the switch of faces and could correctly point out the manipulated pairs; these were included in the retrospective category. Some subjects did not tell us anything at the

debriefing session but after revealing the manipulation they said that they had in fact noticed the change. Again these participants could be categorized under retrospective (if they correctly could point one or more manipulated pairs). The other category, possibly retrospective, includes the participants who claimed they had noticed the change but who pointed out wrong pairs as being manipulated. The fourth and last category, after rating, includes only the last two conditions (since there was no rating in the first two conditions). Trials were sorted in this category when the participants noticed that they had received the wrong picture during the rating procedure. As mentioned above the participants rated both pictures in each pair, first the one they did not originally chose (in the manipulated trials) and then the one they actually preferred. Due to the fact that the participants got to see their actual preferred picture some participants noticed the switch at this point.

The overall detection rate was low i.e. the discovery of the manipulations, and it corresponded to the detection rates found in Johansson et al (2005). For the first condition, the overall detection was 26.6 %, 10 % of these detections were categorized under the concurrent category, 15 % in the retrospective and 1.6 % in the possible retrospective. In the second condition the detection rates was a bit lower, all together the detection rates decreased to 16.6 %. 11.7 % of the trials were detected at once, concurrent, 1.6 % were categorized in the retrospective category and 3.3 % in the possible retrospective category.

In the third condition the overall detection was more like that in the first condition, 24.8 % of the trials were detected. 6.6 % were categorized as concurrent, 3.3 % as retrospective, 6.6 % as possible retrospective and finally 8.3 % of the trials were detected in the attractiveness rating procedure. In the fourth condition the overall detection rate raised a bit to 41.6 %. From these trials 15 % were concurrent detected, 13.3 % were categorized as retrospective, 3.3 % as possible retrospective and 10 % were categorized under after rating.

Detection rates for conditions 1-4

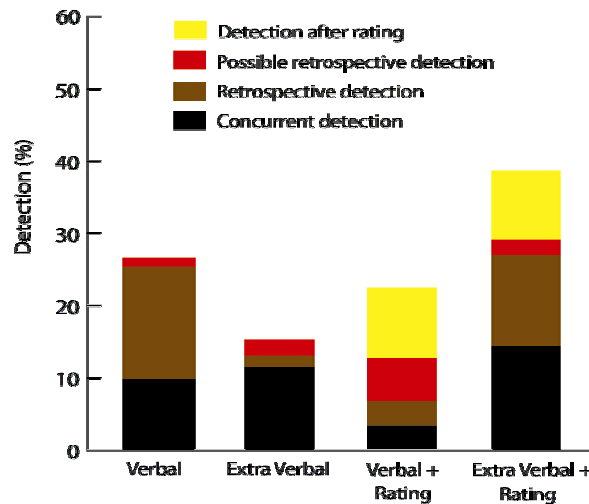


Figure 2: Detection rate measured in percent

Hypothesis one stated that the more feedback (verbalizing and rating) the larger the change in preferences would be. Especially interesting was if the participants would stay consistent with their original choice throughout the whole trial or if they would change their preferences. In the non-manipulated trials, the participants were very consistent in their choices, as they tended to choose the same face in both the first and the second choice. But in the manipulated trials they were more inclined to choose the originally non preferred face, suggesting that our manipulations caused a change in their preferences. A chi-square test showed that there were significant differences between non manipulated and manipulated trials, concerning consistency, in all conditions. The results for condition one was $\chi^2 p= 0.0219$, for condition two $\chi^2 p=0.000$, for condition three $\chi^2 p=0.000$ and finally for condition four $\chi^2 p=0.000$.

Consistency between the first and second choice

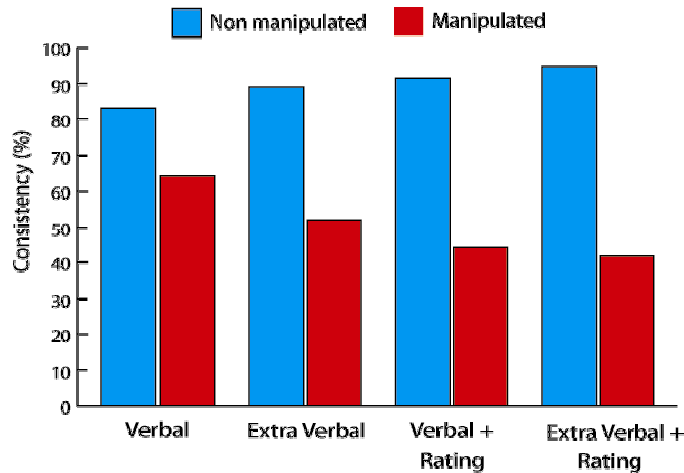


Figure 3: Consistency measured between first and second choice.

To see if there was any difference in consistency, when comparing non manipulated and manipulated trials, a comparison was done among the four conditions. The results showed that there was a significant difference between condition one and condition three $p=0.040$ (Mann-Whitney). There was also significant difference between condition one and condition four $p=0.040$. Combining condition one and two and comparing it to a combination of condition three and four also gave a significant result $p=0.032$. The other comparisons did not give any significant results.

To get a better understanding figure 4 shows the consistency from the first choice to the last rating. The figure is a combination of both conditions three and four (both attractiveness rating conditions). The red lines show the consistency for the participant's original choice i.e. the picture the participant found the most attractive in the first selection. In the non manipulated trials people tend to stick with their original choice to a greater extent than in the manipulated trials. Those participants who gave both pictures the same rating were included in the non consistent group, as they do no longer clearly

prefer their original choice. The percent of subject who gave same rating to both pictures are shown in parenthesis.

Most of the participants rate the pictures they originally did not prefer as higher in attractiveness in the manipulated trials. This is not true for the non manipulated trials, as the participants seem to stay consistent with their choice also when rating both pictures.

In the non manipulated trials the consistency was high, from the beginning to the end. When the participants rated the two pictures the first time 84 % of them gave their original choice a higher score than the picture they did not prefer. When they made their second choice 80 % was consistent with their original choice, i.e. they choose the same face as they did the first time and in the final rating procedure 64% was consistent. When looking at the second choice as many as 93.5 % chose the same face as they did the first time, although 16 % of these had not rated their original choice as higher in the second rating.

The last rating showed that 64 % of the participants were consistent with their original choice throughout the trial. Some participants though switched back and forth through their choices. All together the percentage that was consistent with their original choice when it came to the last rating was 70 %, but 6 % of these had changed their mind during the trial.

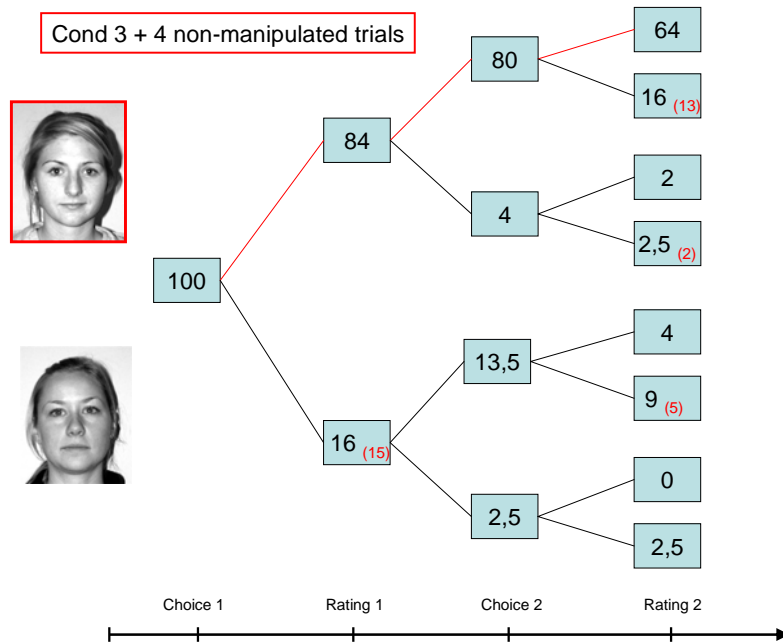


Figure 4: Figure showing the consistency in the non manipulated trials between the different stages in the trial. The red lines showing the consistency from the original choice to the second rating.

The probability that the participants were consistent with their original choice was much smaller in the manipulated trials than in the non manipulated. It was just 6% of the participants who were consistent through the whole trial. 90 % of the participants were not consistent with their original choice in the first rating, some participants rated both pictures as equal attractive but just 10 % actually gave the picture they had pointed at a higher rating score. This was even when they shortly after rating the not preferred got to see the one they actually preferred. In the second choice 6 % of the subjects choose the one they did from the beginning (their original choice). When looking at the second choice there were just 43.5 % who were consistent with their original choice which is much smaller compared to the 93.5 % who chose the same picture both times in the non manipulated trials. From this diagram it seems like most participants changed their mind regarding the picture they preferred from the beginning.

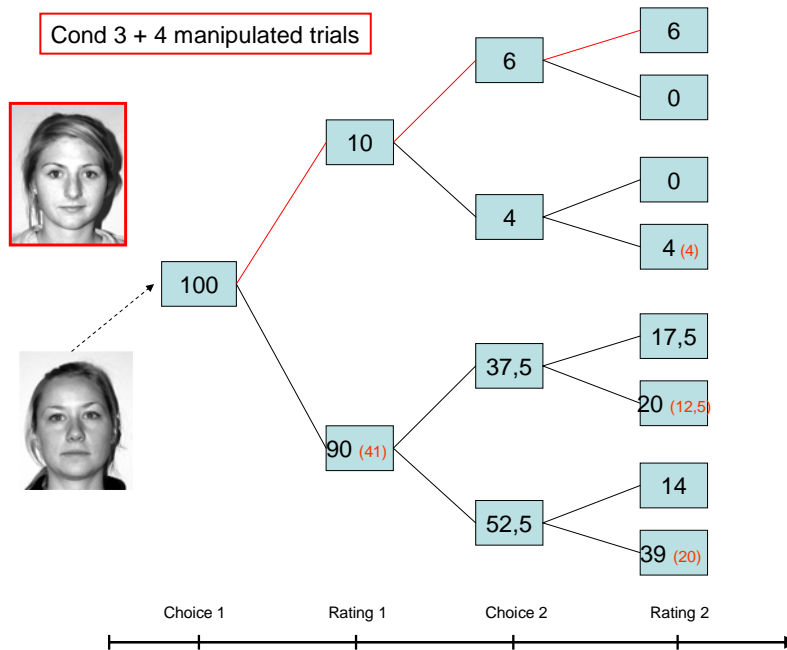


Figure 5: Figure showing the consistency in the manipulated trials between the different stages in the trial. The red lines showing the consistency from the original choice to the second rating.

Comparing figure 4 and 5 with a chi-square test showed that there was a significant difference between non manipulated and manipulated trials regarding consistency between the first choice and the first rating $\chi^2 p=0.000$ and also between the first rating and the second choice $\chi^2 p=0.000$. In the non manipulated trials subjects were consistent in 80 % of the trials whereas just 6 % of the participants were consistent in the manipulated trials. There was also a significant difference between the manipulated and non manipulated trials concerning the consistency between the second choice and the second rating $\chi^2 p=0.000$.

Doing a different comparison in how consistent the participants were from one “time step” to another gave a slightly different result. There was a significant difference between the manipulated and the non manipulated trials comparing the consistency from the first rating to their second choice $\chi^2 p=0.0002$. Comparing the consistency between the second choice to the second rating gave a non significant result $\chi^2 p=0.092$.

Discussion

In this thesis I have replicated and extended the choice blindness results of Johansson et al (2005). Firstly, the results showed that across all four conditions no more than about a third of all manipulated trials were detected by the participants. Most striking perhaps is that less than 10% of all trials were detected concurrently. Thus, in the great majority of the manipulated trials, participants failed to notice that they received a picture that did not match a choice they had made only a few seconds ago.

One possible critique of this result is that the participants might accept the mismatch simply because they instantly forget what their original choice looked like. But this argument is made less likely by the fact that in condition three and four we gave the participants a chance to detect the mismatch by comparing the faces after the choice was made. In both attractiveness rating conditions (condition three and four) the participants were first shown the picture they did not choose (in the manipulated trials) and immediately thereafter they were shown the picture they actually preferred. But despite this strong memory cue, well over half of the participants failed to discover the mismatch.

It is probably the case that the attractiveness rating procedure is the reason why the detection rates are somewhat greater in the last two conditions (see yellow shaded boxes in figure 1). As explained above, in these conditions there is an additional chance to discover the manipulations. But even if the detection rates in general are higher in these last two conditions, I find it remarkable that the effect is as small as it is. The participants were presented with the picture they actually preferred straight after the one they did not prefer, yet this did not stop them from rating the one they did not like as being more attractive than the one they actually preferred. In my view, this shows how robust the choice blindness effect is.

Secondly, the results showed that feedback from the choice blindness trials affects the decisions of the participants in the second series of choices, and that the different types of feedback used in the four conditions of the experiment differentially influenced the preferences of the participants.

We encounter faces on a daily basis and when we meet someone for the first time we can often say if we find that other person attractive or not. Typically we have relatively stable preferences about faces (Rhodes, 2006), and in most situations we know what we prefer although we might not always be able to explain why. The central question that was raised in this thesis was if different kinds and amount of feedback could make a person change their opinions about the attractiveness of female faces. For example, if you hear yourself giving reason for why you like a picture, will this make you like it more afterwards? The results presented indicate that this might be the case, at least for choices made within an interval of 10 to 15 minutes after the mismatched feedback.

This effect cannot be explained by a general tendency for low consistency between the first and second choice among the participants in the study. When looking at the non-manipulated trials the percentage of the participants who are consistent is 90 %. This shows that under normal consequences people tend to remember and prefer the same faces they did at first for the second choices they make. However, in half of all manipulated trials this strong original preference is overridden by the manipulated feedback, so that the participants now prefer the face they originally did not choose.

In all four conditions there is a significant difference between manipulated and the non-manipulated trials, i.e. the participants are more consistent in the non-manipulated trials. This result confirms the first hypothesis that people's preferences are more stable in the non-manipulated trials compared to the manipulated ones. The fact that the participants verbalize and rate the pictures apparently influences their preferences and behavior. This is an example of how people influence themselves through their own actions, and is as such a finding in line with the work of James, Festinger and Bem.

If one looks at the results of the comparison between the four conditions, there is an indication that the attractiveness rating procedure might have had a bigger impact on the participants than the verbal reports. There is a significant difference between condition one and three and between conditions one/two compared to condition three/four. This indicates that the attractiveness rating procedure influences the participants to a greater extent than just providing a verbal explanation of their choice. While the exact

mechanism of this effect was not investigated in this study, one can speculate that the firmness and distinctiveness of the numerical judgment provided a clear standard for the participants to compare and contrast across their two choice series, thus making the issue of consistency between choices more vivid in their minds.

I also found a difference between condition one and four but this difference is harder to explain. Since there was no significant difference between condition one and two I can conclude that it does not matter if the participants were encouraged to give an extra verbal report or just a short one. Therefore the difference between condition one and four should not have anything to do with the extra verbal report. However, at the same time, the participants in both attractiveness rating conditions has to give some kind of verbal report as well as doing the attractiveness rating. So it is hard to say if it is just the rating procedure that has an effect or if it is the combination of verbal reports and rating.

The results do not confirm my second thesis, that the longer the participants have to verbalize their reasons the less consistent they would be in the manipulated trials. This is because the comparison between condition one and two does not give any significant difference so there does not seem to be any difference whether the participants talked for one minute or for how long they wanted.

I was also interested to find out how consistent the participants were with their original choice over time which could be concluded by looking at the time figures (figure 4 and 5). There is a difference between the non manipulated and the manipulated trials and it is fascinating to see how many participants that are consistent with their original choice in the non manipulated trials compared to the manipulated ones. This big difference shows that we under “normal” consequences have quite robust preferences that do not change so easy, at least not during this 10-15 minutes. So the changes in preferences, in the manipulated trials, are most likely to be an outcome of the false feedback the participants get.

As previously mentioned I categorized the trials as non consistent if the participants rated both pictures in each pair as equally attractive. Maybe one can argue that the participants

are just as consistent as non consistent in this situation. But since the participants for a fact did not rate their original choice as higher than the not preferred one I think it is reasonable to say that they are not consistent. And also in the manipulated trials the participants were presented with the picture they actually preferred just after they had rated the one they did not prefer, so here they had a good chance at switching back to their original choice and rate this one as higher. It also might have been that the participants thought that both pictures were equally attractive but then more participants should have had a harder time choosing which face they preferred the first time, but this is not the case.

Or maybe the participants think that the second picture is more attractive but since they know that their preferred picture is shown first they might feel that they have to rate this one as higher in order for their own behavior to make sense. This interpretation would also fit with the previously discussed theories of cognitive dissonance (Festinger 1957).

It is interesting to note that the percentage of the participants that discover the mismatch in the attractiveness rating procedure is not higher. The fact that the participants first rate the picture that they originally did not choose and then shortly thereafter are presented with their original choice but still rate this first presented choice as higher is also noteworthy. In hypothesis three I anticipated that fewer participants would rate their original choice as higher in the manipulated trials than in the non-manipulated ones. Again, if we look at the first rating in figure four and five it is shown that not more than 10 % of the participants rate their original choice as higher than the not preferred picture. Compared to 84 % in the non-manipulated trials it is a significant difference.

Looking at the second rating it shows that the consistency percentage in the manipulated trials is quite low. This is interesting since this rating is completely different from the first one. Instead of showing each picture in pairs (as the first time) each picture is presented one at a time. But still when presenting each picture by itself and the participants do not have the pair picture to compare to, they do not switch back to the one they preferred from the beginning and rate this one as higher. This might indicate that the preference change is robust, that the participants still rate their, from the beginning, not preferred

picture as higher than their original choice. This can also be seen as an argument against the cognitive dissonance interpretation above, that the participants are “forced” to rate the originally non-chosen picture higher because it is presented first in the rating phase.

The reason why each pair was just shown for four seconds each was because in Johansson et al (2005) they concluded that there were no significant difference between the detections when they showed the pairs for 2 or 5 seconds or when the participants could look for as long as they wanted. So, I therefore felt that four seconds were enough in order for the participants to make a choice. In the debriefing session I also asked the participants if they felt that four seconds were enough to make a choice or if they felt stressed. Almost everyone said it was enough. I also noticed that during the experiment most participants knew straight away what picture they preferred and it was only during a few trials that some participants hesitated.

Just like previous research (Bernstein et al, 2005, Field, 2006, Leippe and Eisenstadt, 1994) this thesis has shown that it is possible to change people’s preferences. But this thesis also shows that it is possible when the participants themselves make an active choice and when they are not forced as in forced compliance to take one stand or another.

We do not completely know how robust this effect is over time but the effect is quite strong given the context of this experiment, and it last for at least around 15 minutes. In the future it would be interesting to see how robust this effect is and see for how long it lasts. The experiment has been tested in other modalities as well and it has been shown that people can be blind to the outcome of their choices when it comes to taste and smell as well. But it would be interesting to see whether this preference change effect is present in these modalities as well and also to look at other kinds of stimulus material, other types of pictures, cars, landscapes, or text passages.

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Appendix

The six verbal report pairs



Pair 1



Pair 2



Pair 3



Pair 4



Pair 5



Pair 6