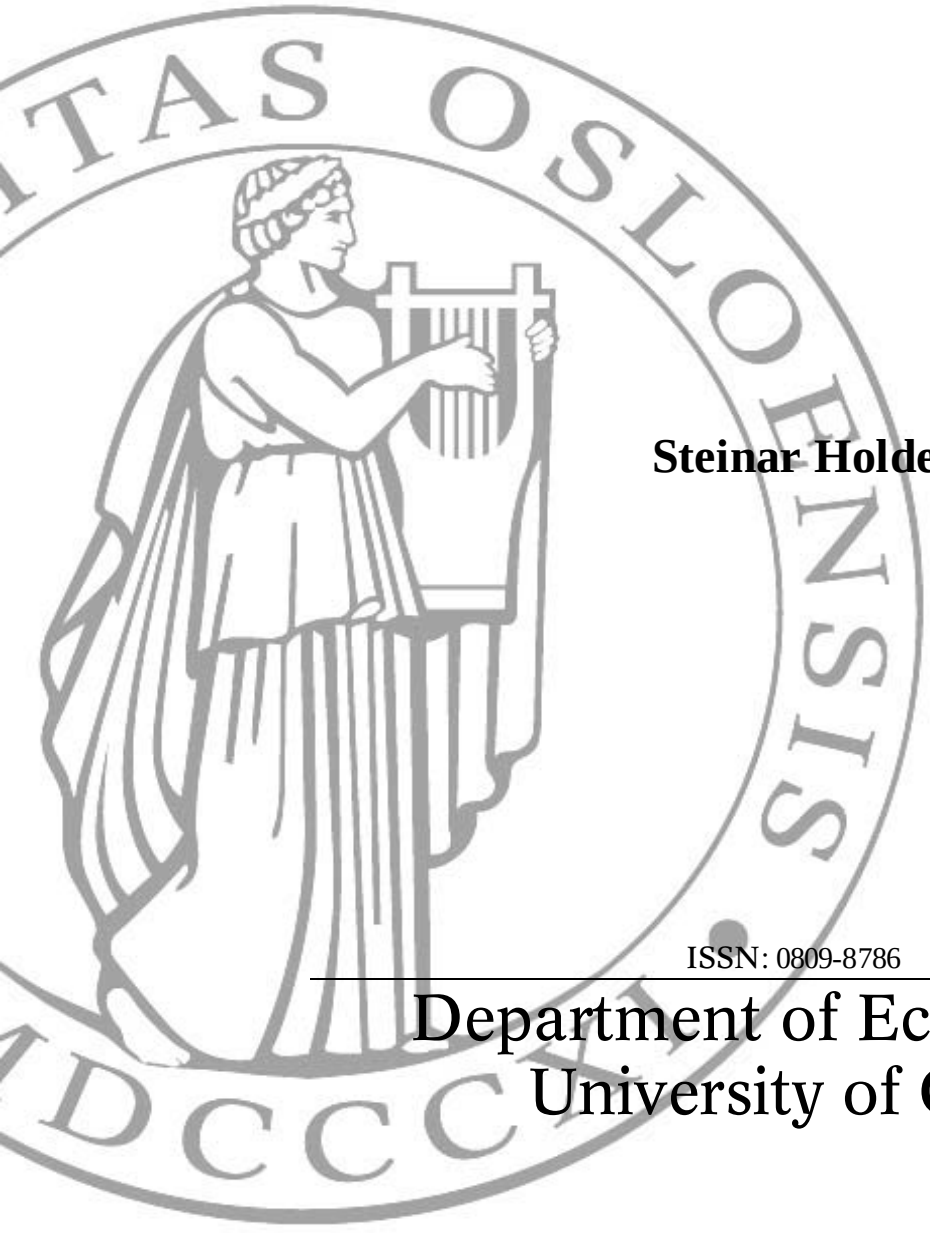
MEMORANDUM

No 18/2009

How Prevalent is Post-Decision Dissonance? Some Doubts and New Evidence



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ISSN: 0809-8786

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This series is published by the
University of Oslo
Department of Economics

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How Prevalent is Post-Decision Dissonance?
Some Doubts and New Evidence

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August 2009

Abstract

Recent research is exploring the case for cognitive or post-decision dissonance using the free-choice paradigm of Brehm (1956). Participants are repeatedly faced with a choice between items that they have given the same rating of liking, two items at a time, and it is found that items not chosen in one choice has a lower tendency of being chosen in a subsequent choice against a different alternative item. This tendency is interpreted as evidence for cognitive or post-decision dissonance. I argue that this interpretation of the evidence is invalid. Furthermore, I report a novel experiment in which participants were specifically asked to compare the items, allowing for a consistent interpretation of the evidence. I find no evidence of post-decision dissonance after a choice between items where one was viewed as more attractive than the other, but potentially some weak evidence of post-decision dissonance after a choice between items viewed as equally attractive.

JEL code: D03
Keywords: post-decision dissonance, cognitive dissonance, preferences

Acknowledgment

The author would thank Victoria Halstensen, Åshild Johnsen and Askill H. Halse for their help running the experiment, Aanund Hylland, Robert V. Kail, Kalle Moene, Geir Overskeid and Åsa Rosèn for helpful discussions/suggestions on the experimental design, participants at a presentation of an earlier version of the paper at Department of Psychology, University of Oslo, for stimulating suggestions, and the children and personnel at the following preschools: Andromeda, Universitetets Barnehage and Blindern Barnestuer for their kind participation.

The paper is part of the research activities at the centre of Equality, Social Organization, and Performance (ESOP) at the Department of Economics at the University of Oslo. ESOP is supported by the Research Council of Norway. An earlier version of the paper was circulated under the title: “Testing for Cognitive Dissonance. Evidence from Children”.

Introduction

The theory of cognitive dissonance has been subject to a lot of research since it was proposed by Leon Festinger in 1957 (Festinger, 1957). In a recent paper, Egan, Santos and Bloom (2007) used the free-choice paradigm of Brehm (1956) to test for cognitive or post-decision dissonance among preschoolers. They find that when children are repeatedly faced with a choice between items (in this case stickers) that the children previously had given the same rating of liking, two stickers at a time, a sticker that is not chosen in one choice has a lower tendency of being chosen in a subsequent choice against a third sticker. Egan et al interpret this as a change in the attitude toward the unchosen sticker, deeming it less valuable, i.e. as evidence for post-decision dissonance.

However, as pointed out independently by Chen (2008) and in a previous version of the current paper, this interpretation is problematic. Even if the children have given the two stickers the same rating of liking, it may still be the case that the children prefer one over the other. The fact that a child chooses one sticker over another, provides information that the former sticker is likely to be better than an average sticker with the same rating, while the unchosen sticker is likely to be inferior. This implies that the preference for the third sticker need not be caused by post-decision dissonance. In this article I report the results from a modification of the experiment of Egan et al, which is designed to avoid this problem. I find no evidence of post-decision dissonance after a choice between items where one was viewed as more attractive than the other, but some potential evidence of post-decision dissonance after a choice between items viewed as equally attractive.

A free-choice experiment

In the experiment of Egan et al, 30 4-year-old children were shown a number of commercially available foam stickers of various shapes. The children were asked to rate the stickers using a smiley-face rating scale with six rating levels, and one identified a number of *triads*, that is, three stickers that a child had given the same rating. In the next phase, each child was given the choice between two stickers from a triad. Finally, the child was given a second choice between the sticker not selected in the first choice, and the third sticker from the triad.

As the three stickers were given the same rating level, one would expect that in a choice between two of them, there would be a 50% probability for each. The hypothesis of interest was whether the choice between two equally preferred stickers would affect the children's liking of them, specifically that they afterwards would like the unchosen sticker less because of the prior decision. In other words, would a decision to choose sticker A over sticker B in choice 1 induce the child to prefer a third sticker C over B in choice 2? It turned out that the child chose the novel alternative, C, in 63% of the cases. Egan et al interpreted this as indicating that the children demonstrated a decrease in their preference for the sticker not chosen in the first choice, i.e. as evidence of post-decision dissonance.

However, even if the three stickers were given the same rating level, the children do not necessarily view them as equally attractive. Children may have a finer preference scale for stickers than six levels, implying difference in attractiveness within the same rating level. If we assume that the stickers are not equally attractive, but rather that the children, when given the choice, are able to strictly rank the three stickers, there are six possible rankings. These are

1	A	better than	B	better than	C
2	A	better than	C	better than	B
3	B	better than	A	better than	C
4	B	better than	C	better than	A
5	C	better than	A	better than	B
6	C	better than	B	better than	A

Ex ante, all these rankings are equally likely. However, with the additional knowledge of the first choice, where sticker A was preferred over sticker B, some of these rankings are no longer possible. Specifically, we can delete the rankings 3, 4 and 6, where B is better than A, as these rankings are inconsistent with the first choice. One is then left with three possible rankings: 1) ABC, 2) ACB and 5) CAB. We observe that B is ranked above C in only one of them, while C is ranked above B in the latter two. With constant preferences, i.e. without any form of decision rationalization, these three possibilities are still equally likely. Thus, it follows that without any decision rationalization, one would expect the participants to prefer the third sticker C in 2/3 or 66.7% of the cases, rather close to the experimental outcome from Egan et al's study of 63.0%.

The intuition here is that while A, B and C are equally attractive in expected terms ex ante, the fact that a child prefers A to B provides new information that A is likely to be somewhat more attractive, and B somewhat less attractive. Thus, participants are likely to prefer A over C (with probability 2/3), and C over B (with probability 2/3), cf. the possible rankings above. This is the basis for the critique in Chen (2008) and in a previous version of the current paper.

The critique of Chen (2008) has led to debate (Sagarin and Skowronski, 2009, Chen and Risen, 2009) as well as new experiments designed to avoid the problem. Chen and Risen (in preparation) and Risen and Chen (2009) redesign the experiment so as to circumvent the problem, along the lines suggested in Chen (2008). Egan, Bloom and Santos (2009) consider the effects when the participants choose between objects they cannot see, implying that any effect on subsequent choices cannot be caused by any prior preferences between the objects. The present paper suggests a different route to explore the issue.

The novel experiment

The argument given above is based on the implicit assumption of a perfect ranking of stickers, so that the children always prefer one over another. However, we all know that in some cases it may be difficult to choose between two items, so it is not clear that the children will always have a strict ranking. Thus, I make a small but important departure from the assumption of perfect ranking. I still assume that the children's liking of the stickers can be measured along a continuous scale, so that there in principle is always a perfect ranking. However, I also assume that for each child there is a minimum distance of preference that is necessary for the child to say that one sticker is better than the other. In other words, if the stickers are too close on the scale, the child will be unable to tell which sticker is better. Thus, in an experiment it will be important to allow for the possibility that children are indifferent between two stickers.

43 4- and 5-year-olds participated in the study, 20 girls and 23 boys. Children were recruited from three preschools in the Blindern area, in Oslo, Norway. They were tested in their preschool, while sitting at a desk across from the experimenter.

The children's preferences for different stickers were assessed using a smiley-face rating scale that included five faces, from sad to very happy, corresponding to five levels of liking.[1] While many of the children already were familiar with smiley-faces as a measure of liking, the experimenter nevertheless ensured that all understood the scale. This was confirmed by appropriate responses to three queries by the experimenter: "Let's say I like a sticker a whole lot/not at all/somewhere in the middle. Which face should I put it with?"

When the children had shown that they understood the rating scale, they were presented with stickers one by one and asked to match to the faces. We used commercially available adhesive foam stickers with various pictures and shapes, like faces, animals, stars, etc. Most children rated all the 30 stickers presented to them, but 5 became fatigued and stopped earlier. One child rated only two triads, i.e. two times three stickers with the same rating level, while the other children rated at least five triads.

The next phase was conducted by another experimenter, to avoid the children being questioned repeatedly by the same person about their preferences over the same stickers. Each child was given the choice between two stickers, A and B, randomly chosen from a triad. The stickers were put on a plate in front of the child, and the experimenter asked "Do you like these stickers equally much, or do you like one sticker better than the other?" When the child had responded to this question, he or she was asked which of the stickers he or she would like to take home. (Chosen stickers were put in an envelope bearing the child's name, to be taken home at the end of the day.) Next, the child was again presented with two stickers, this time the unchosen alternative (which we refer to as B) and the third sticker in the triad, C. Again, the experimenter asked "Do you like these stickers equally much, or do you like one sticker better than the other?" When the child had responded to this question, he or she was asked which of the stickers he or she would like to take home, and the chosen sticker was put in the envelope. This process continued until the child had chosen between all the triads.

Note that asking the children to compare two specific stickers at a time has considerable advantages over other ways of measuring the preferences of the children. In an initial rating of many stickers according to a predefined rating scale, there may be problems that the children have a finer rating than the scale, or that the children are unable to use the rating scale in a consistent way over time.[2] If children are asked to rank a number of different items, this may force them to rank items that they find equally attractive. Furthermore, it may be more difficult to rank many items at the same time, rather than comparing just two items. As pointed out by Chen (2008), in experiments when participants are asked to rerank a number of items, the second ranking is usually not fully consistent with the first. When the children are first asked to compare two stickers, and then choose between them, they are faced with simple tasks. Moreover, as the choice between the stickers is undertaken immediately after the comparison between them, the two decisions are likely to be consistent with each other.

Results

In total, the 43 children rated 339 triads, i.e. an average of 8.3 triads. All the children responded at least once that they preferred one sticker to the other in both choices, and this happened in 223 cases. In these cases the above argument conditional on a complete ranking applies. Thus, when we know that sticker A is better than sticker B, three of the six rankings

[1] Experience from an earlier experiment suggested that five levels is enough, and that many children had problems with making use of a grading scale with more levels.

[2] Presumably, most teachers who have graded a large number of exams have experienced the problems of being consistent in the grading over time, unless one uses specific measurement devices so as to avoid this problem.

are no longer possible, and from the remaining three rankings the expected ratio for the novel sticker C is 66.7%. The experimental outcome was somewhat lower, 64.6%, with a 95% confidence interval from 58.2% to 70.9%. Thus, there is no indication of post-decision dissonance, even if the fairly wide confidence interval clearly implies that we cannot rule out that it nevertheless exists.

In 86 of the first choices, the child responded that he or she liked the two stickers equally much. 33 children did this at least once. Thus, in these cases the first choice gave no information of a prior preference of the stickers, and the expected ratio of the third sticker C in the second choice would hence be 50 %. In the experiment, the third sticker C was chosen in 52 of the 86 cases, or 60.5%. The 95% confidence interval was 49.9% to 71.0%, and the ratio was above the expected 50% with a p-value of 5.2%. Thus, this gives some indication of post-decision dissonance after a choice between stickers which the child finds equally attractive.

Discussion

The experiment gave no indication of post-decision dissonance in the large majority of the decisions, when the children had responded that they preferred one sticker above the other in both choices. The expected ratio for the novel sticker with constant preferences is 66.7%, while in the experiment the novel sticker was only chosen in 64.6% of the cases, i.e. no tendency of devaluing the rejected sticker. Note that this interpretation is based on a key assumption that when a child responds that s/he likes one sticker better than another, then s/he chooses the one s/he likes best in the subsequent choice. Now, as pointed out by Sagarin and Skowronski (2009) in their argument against Chen (2008), there is some literature suggesting that choices are often probabilistic, in the sense that options that are slightly better are chosen only slightly more often than options perceived as slightly less valuable, see e.g. Carroll and De Soete (1991). If the children take the sticker they like better with probability less than unity, it is straightforward to show that the expected probability for choosing the third sticker in choice 2, with constant preferences, is less than 2/3. In this case, the experiment cannot be used to detect post-decision dissonance. However, as argued by Chen, the experiments in this literature are typically based on situations where the options differ slightly in some objective terms. For example, a participant may choose a lever giving slightly more food than another lever slightly more often. It is not clear that the participants expect the difference between the choices to be constant over time. In the present case, the participants are asked a simple question of whether they like one sticker better than the other, and they respond positively to this question. It is then hard to understand why they would not choose the sticker that they like better.

In the minority of cases where the children found the stickers in the first choice equally attractive, they chose the novel sticker in the second choice in 60.5% of the cases. The expected ratio with no tendency of devaluing the rejected sticker is 50%. Thus, this gives indication of post-decision dissonance with a p-value of 5.2%. However, this interpretation of the experiment is based on a key assumption that when a child says that two stickers are equally attractive, then this is really the case, and in the subsequent choice the stickers have an equal chance. In contrast, if children say that the stickers are equal also when they think that the difference is negligible, and they then take the one they like better with a probability above 0.5 but below unity, the expected ratio for C would be between 50% and 66.7%. Then, the results would involve no evidence of post-decision dissonance. While there is reason to give considerable confidence to the children's responses, it is hard to rule out that the children

in some cases respond that they like the stickers equally much also when they think that the difference between the stickers is very small. Thus, this evidence for post-decision dissonance seems less reliable than the evidence based on the majority of the cases, against post-decision dissonance.

Overall, the experiment gives no indication of post-decision dissonance after a choice between two stickers given the same rating of liking, but where the child nevertheless responded that he or she liked one better than the other. In the some 25% of the cases when the choice was between stickers viewed as equally attractive, there is potential evidence of post-decision dissonance. While this distinction is consistent with the idea of Brehm (1956), that post-decision dissonance is stronger after difficult choices, the latter evidence is based on a strong prior assumption and thus less reliable. There is a need for more experiments to shed light on the robustness of these findings.

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