

Influence of Inconsistent Evidence on Juror's Change of Mind

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The present study aims to test whether the coherence of a juror's mental model of a case is a function of the decisional phase (pre- or post-decision) in which inconsistent evidence is presented. Based on psychological and neurological theories of decision-making, it was hypothesized that inconsistent information could cause a shift in juror's verdict preference more often when the information is presented after the decision is almost shaped than when it is presented while the decision is still shaping. With an actual criminal case in which the evidence was generally skewed toward the guilty verdict, three hundred collage students established an initial verdict preference and rated the likelihood of guilt of the defendant after reading a description of the facts and the first two pieces of strongly incriminating evidence. Participants then read the rest of the evidence, and decided on a final verdict and re-rated the likelihood of guilt. One of the two types of inconsistent evidence, one weakening the prosecution's case and the other supporting the defense's case, was presented either soon after the initial verdict preference was made or just before the final verdict was made. The initial guilty preference shifted in the final verdict more often, and the rated likelihood of guilt decreased more with the late presentation than with the early presentation of the inconsistent evidence. Implications for juror's decision-making in court are discussed.

Keywords : juror decision-making, change of mind, metacognition

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Introduction

Jurors are known to construct a mental model (or story) of the case favoring one side early in the trial and then process the incoming information to make decisions in a way that supports the mental model under construction - a tendency that is called *coherence-based reasoning* (Carlson & Russo, 2001; Diamond & Casper, 1992; Glöckner & Engel, 2013; Pennington & Hastie, 1986, 1992; Simon 2004). This kind of reasoning, which partially relies on intuitive-automatic processing, leads individuals to modify their perception and evaluation of the information given in favor of their mental model of the situation (Greitemeyer, Fischer, Frey, & Schulz Hardt, 2009; Jonas, Schulz-Hardt, Frey, & Thelen, 2001; Lord, Ross, & Lepper, 1979). Under the coherence-based reasoning, the information that supports the mental model of the case is highly appreciated, whereas the information that is inconsistent is depreciated in perceived importance and credibility even when it is quite plausible (Carlson & Russo, 2001; Glöckner & Engel, 2013; Kosnik, 2008; Pennington & Hastie, 1992; Simon, Krawczyk, & Holyoak, 2004).

This biased information processing in favor of the mental model under construction, sometimes called *coherence effect* which reflects a negative by-product of coherence-based reasoning, can lead to poor decision outcomes because potential risks and warning signals may be overlooked as evidence is not being fully considered (Fischer et al., 2011; Hernandez & Preston, 2012; Jonas et al., 2001; Kray, & Galinsky, 2003). Failure to consider inconsistent pieces of evidence can also be

a barrier to correcting a faulty decision (Brockner & Rubin, 1985).

According to the Spinozan belief procedure, a well known account of a human belief, changing mind takes time and effort, and the rejection of an existing belief is less easily and quickly acquired than the construction of a new belief (Gilbert, 1991). It is often easier to disregard the alternative rather than to adjust an existing belief (Hernandez & Preston, 2012). Likewise, jurors would be reluctant to modify their mental model of the case and instead disregard the evidence that is inconsistent with their tentative (or preferred) verdict so as to keep the model coherent. Glöckner and Engel (2013) demonstrated how strong the effect of coherence-based reasoning on jurors' decision-making is. Their study showed that jurors' verdict or perceived probabilities of guilt were little influenced by a manipulation of probative values of evidence, and that rather robust coherence shifts (i.e., distortions of the evidence in accordance with the favored verdict) occurred when they encountered strong inconsistent evidence which contradicted the favored verdict.

The mental models the jurors construct are considered to be the best predictors of verdict (Pennington & Hastie, 1992). The final verdict the jurors reach usually conforms to the tentative decision they initially formed (Carlson & Russo, 2001; Lawson, 1967). Jurors are likely to hold on to their own perspectives about the case, and it seems hard for them to change their verdict preference when they encounter new inconsistent evidence.

A question arises as to how, then, jurors can escape from this decision bias to stick to the

avored verdict, and consider the alternative and apply it to their judgments. Little research has investigated the juror's change of mind in the face of inconsistent evidence. The present study, directly addressing this question, identifies individual's decisional phase in which inconsistent evidence is presented, as a condition in which jurors may change their mind about the verdict preference they preliminarily formed. Contrary to common sense, inconsistent information is more likely to cause change-of-mind if the information is presented after the decision is made rather than when it is given while the decision is being constructed. Theoretical bases for this hypothesis are derived from both psychological and neurological studies on decision-making.

Psychological basis of change of mind

Decision-making is a deliberative process that may result in a course of action. There are two parts in the process of making a decision: the *pre-decisional phase* before the selection of a decision alternative and the *post-decisional phase* after the selection (Gollwitzer, Heckhausen, & Ratajczak, 1990; Svenson, 1992, 2003). The two parts of the decision process require different types of information processing and psychological functions, with different ultimate goals (Gollwitzer et al., 1990; Krupnikov, 2011).

Pre-decisional phase

In the pre-decisional phase, individuals face the task of selecting the best alternative that is differentiated from other alternatives (Svenson, 1992). The process of constructing a decision, in

which individuals have to search and evaluate information that can be useful for reaching a selection, naturally leads them to discriminate the preferred (more attractive) and the non-preferred (less attractive) alternatives. Individuals, then, ultimately select the best alternative based on the perceived superiority.

Since parts of the mental representations (mental model) an individual forms and uses as cognitive filters to process information while constructing a decision are intuitive or unconscious, psychological bias or heuristic often could be involved in this pre-decisional phase (Glöckner & Engel, 2013; Gold & Shadlen, 2007). Pre-decisional individuals often engage in asymmetric information search, interpretation, and evaluation in favor of their expectations or tentative hypotheses, which hinders full consideration of all available information and results in premature or poor decision (Jonas et al., 2001). Most people, however, are unaware of this pre-decisional information distortion (Carlson & Russo, 2001), and they feel that all available relevant information has been processed well, thus experiencing a full-blown deliberative state of mind which transfers them into the post-decisional phase (Gollwitzer et al., 1990).

Post-decisional phase

While pre-decisional individuals consider the available alternatives and differentiate them to select the best one, the primary interest for the post-decisional individual is to consolidate the decision to implement an action (e.g., jurors render final verdicts, voters cast vote for the chosen political candidate) (Gollwitzer et al., 1990;

Svenson, 2003). Interestingly, the post-decisional phase in which people feel a selection is already completed is related to an increase in individuals' readiness to change their mind (Janis & Mann, 1977; Svenson, 1992). This contradicts the expectation of psychological research on decision bias that individuals will adhere to their selection and be less likely to consider other options once they make up their mind (Festinger, 1962). The post-decisional processing, in which decision-makers take the costs and benefits of the action more into account (Orbell & Sheeran, 2000), plays a crucial role in *meta-cognitive judgment* which can lead to a change of mind or to sticking to the initial decision (Gollwitzer et al., 1990). The inconsistent information that might have been disregarded in the pre-decisional phase may allow the decision-maker to evaluate or doubt the decision and correct errors in the post-decisional phase (Krupnikov, 2011; Svenson, 1992).

Once the perception of superiority of the chosen alternative is in doubt, there is no reason to enact the selection (Krupnikov, 2011). Jurors may still prefer the prosecution in a criminal trial, but the preference may not be certain enough to enact defendant's guilt beyond a reasonable doubt, which might lead them to eventually reverse their initial verdict preference.

Neural basis of change of mind: Drift-Diffusion Model

Studies on decision-making in the level of neural mechanisms of brain provide more direct evidence that post-decisional processing plays an important role in change of mind. The

'drift-diffusion' model, in which simple two-choice decision processes in the brain are accounted via an accumulation-to-bound mechanism, has been widely applied to explain decision-making, ranging from simple perceptual decisions to rather complex decisions such as an economic decision-making that requires deliberative cognitive functions (Yeung, & Summerfield, 2012). According to the drift-diffusion model (Ratcliff, 1978; Ratcliff, & Rouder, 1998; Ratcliff, & McKoon, 2008), a decision is made when the accumulating evidence or decision variable¹⁾ drifts outward overtime from a starting point and ultimately reaches one of two response criteria or boundaries. The rate of accumulation of evidence is called the drift rate, and it is determined by the quality of the evidence. This simple model, in which decision difficulty, confidence, and the timing and accuracy of the decision can be explained by both the quality and the quantity of the evidence, allows detailed explanations of decision behavior for binary choice.

Resulaj, Kiani, Wolpert, and Shadlen (2009) extended the accumulation-to-bound mechanism to account for the post-decisional data stream (accumulation of evidence), particularly regarding the change of mind after the initial decision has been made. Resulaj et al. (2009) demonstrated that a decision-maker does not use all of the available evidence to make the decision and instead exploits the unused evidence to either

1) DV (Decision Variable) represents "the accrual of all sources of priors (probability that hypothesis is true before obtaining any evidence about it), evidence (information favoring particular hypothesis), and value (subjective potential costs and benefits associated with the outcome) into a quantity that is interpreted by the decision rule to produce a choice" (Gold & Shadlen, 2007).

subsequently reinforce or reverse the decision, indicating that change of mind relies on post-decisional processing. The extended drift-diffusion model shows that the evidence continues to accumulate beyond the choice point at which the initial decision was made. The drift rate after the initial choice either strengthens the choice or regresses backwardly to reach a 'change-of-mind' bound which is located between the two decision (response) bounds. Thus, change-of-mind can occur in the post-decisional process before all of the evidence accumulated during the pre-decisional process is exhaustively cancelled by the newly encountered evidence.

According to this model, decision-makers are more likely to reaffirm the initial decision rather than to change their mind because the accumulated evidence or the initial decision bound is still far from the change-of-mind bound, indicating that the process of change of mind is effortful and costly. Accordingly, strong evidence is required to turn the drift rate backwardly to reach the change-of-mind bound. Altogether, the extended drift-diffusion model implicates that individuals often make a premature decision based on incomplete information and that post-decisional processing plays a significant role in meta-cognitive judgment and error monitoring which leads to reaffirming the initial decision or a change-of-mind.

Hypotheses

Both psychological and neurological studies share the perspective that post-decisional processing plays an important role in meta-cognitive thinking

leading to a change of mind. Although the juror is assumed not to make judgment about the verdict until all the evidence has been presented and the judicial instructions have been given at the end of the trial (Diamond & Casper, 1992; Hastie, Penrod, & Pennington, 2013), jurors in actual trials are known to make up their mind about the ultimate verdict before the conclusion of the trial (Hannaford, Hans, Mott, & Munsterman, 1999). Therefore, the present study supposes that jurors' meta-cognitive thinking is readily activated in the later part of the trial in which most of the evidence has been presented and their mind about the verdict decision has been somewhat definitely made. The present study predicts that jurors will be more likely to change their verdict preference from guilty to not guilty (1) if the inconsistent evidence is presented in the later part of the decision task as compared to when it is given in the earlier phase of the decision task. Moreover, jurors will be more likely to change their verdict preference from guilty to not guilty (2) if the inconsistent evidence is the type weakening the strength of the initially favored choice (guilty) as compared to the type strengthening the initially disfavored choice (not guilty). Jurors with the former type of inconsistent evidence will be more likely to change their mind, as individuals devote more meta-cognitive attention to the information about the initially chosen alternative (Smith et al., 2006; Svenson, 1992).

Method

With a scenario of criminal trial, the participants

were led to initially or tentatively construct a pro-guilty attitude toward the case (i.e., preference of the prosecution's case to the defendant's case) after reading a description of the facts and the first two pieces of strongly incriminating evidence. They were then asked to establish an initial verdict preference, read the rest of the evidence, and render a final verdict. One of the two types of inconsistent evidence (either weakening the strength of the prosecution's case or supporting the defense's case) was presented either soon after the initial preference was rated or just before the verdict was made.

Pilot study

The criminal case used in the present study was based on an actual lay participation trial in Korea. In the real trial, a 9-persons jury unanimously recommended the verdict of guilty, but nevertheless the presiding judge acquitted the defendant, citing that the prosecution failed to prove the defendant's guilt beyond a reasonable doubt. Prior to the present study, a pilot study was conducted online with 128 juror-eligible adults (45.05 years old on the average) to calibrate the strength of the evidence presented in the real trial. After reading a summary of the trial, the participants rated the reliability of each piece of evidence on a percentage (%) scale with 100% for "perfectly reliable" and the importance of each of them on a 5-points ordinal scale with 5 for "very important." The participants were also asked to decide on a verdict; 84% of them decided that the defendant was guilty. By the pilot study, the criminal case used in this study was found to lead

the juror-eligible adults to convict the defendant. Other results from the pilot study, pertaining to the calibration of the evidence strength, will be described as necessary throughout this article.

Participants

Three hundred college students (171 men and 129 women; ages ranging from 23 to 59 years, $M_{age}=20.86$, $SD = 2.20$) attending psychology courses participated in this study in return for a small course credit. They were asked to participate in a survey of "the general patterns of verdict decision by potential jurors for criminal trials." Double response was not allowed and incomplete responses were discarded.

Case

The defendant (a non-smoker) was charged with murder of her husband (a smoker) but maintained her innocence throughout the trial. The defendant argued that the husband, in the middle of a fierce quarrel, suddenly committed suicide by pouring gasoline and setting fire on his own body in the bathroom of their apartment. This contradicted the prosecution's theory that the defendant strangled her drunken husband during the fight, dragged him onto the toilet seat, and set fire on the victim's body to stage a suicide.

Evidence

The prosecution presented 5 pieces of evidence including (1) marks of strangulation around the victim's neck, (2) an autopsy report on the

victim's body (indicating a high likelihood of the lack of normal breathing before being set on fire), (3) marks of violence/struggle on the victim's body, (4) witness testimony from a sales clerk of the nearby gasoline station, and (5) the defendant's postmortem dishonest acts related to the incidence. The defense presented 4 pieces of evidence including (1) the victim's unstable emotional state before committing suicide, (2) doubts about the marks of violence on the victim's body, (3) circumstantial evidence for the absence of defendant's criminal motive and intent, and (4) one of the two pieces of inconsistent evidence (either weakening the prosecution's case or strengthening the defense's case).

From the pilot study, the prosecution's evidence was rated as generally more reliable and as more important than the defense's evidence. The reliability was rated in the range of 51.65 and 78.14 for the incriminating evidence and in the range of 51.56 and 66.21 for the exculpatory evidence. The importance of the incriminating evidence was rated in the range of 3.20 and 4.48 while that of the exculpatory evidence was rated in the range of 3.15 and 3.88. The two pieces of inconsistent evidence were rated in the pilot study as the most reliable and important among the exculpatory evidence. One of the inconsistent evidence was an expert testimony contradicting the interpretation of the autopsy results presented by the prosecution, and the other inconsistent evidence was a cigarette lighter found with only the victim's fingerprint on it. Both inconsistent evidences were against the prosecution's theory, but the difference was that the former focused on impeaching the validity of the prosecution's theory

while the latter focused on supporting the defendant's claim.

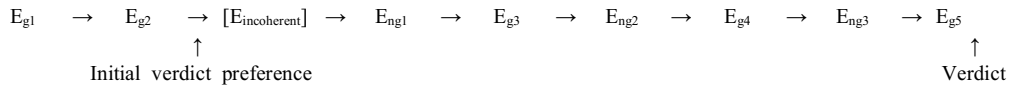
Procedure

Participants were randomly assigned to a condition in a 2 (Decisional Phase at the time of the inconsistent evidence presentation: pre- or post-decision) x 2 (Type of inconsistent evidence: weakening the prosecution or supporting the defense) between-subjects design. All participants were instructed that they would be asked to decide on a verdict after reading a script of an actual criminal trial. Following the instructions, participants read a four-page summary of the trial. After the summary of the trial, the participants read 9 pieces of evidence including 5 pieces of incriminating evidence, 3 pieces of exculpatory evidence, and the critical inconsistent evidence.

After the first two pieces of strongest incriminating evidence were presented, the participants were asked to establish an initial verdict preference. The participants were informed, prior to the initial preference rating, that they would read several more evidence and decide on the ultimate verdict later. For the initial preference, they responded to questions asking for the favored verdict (guilty or not-guilty), confidence (%) in the initial choice, perceived likelihood of the defendant's guilt (%), and appropriate sentence if guilty (years of imprisonment).

After the initial verdict preference rating, the participants continued to read the rest of the evidence. They then responded to the same questions as they did for the initial preference rating to render the final verdict that was

Pre-decisional presentation condition



Post-decisional presentation condition

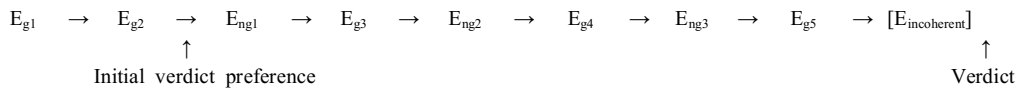


Figure 1. Order of Evidence Presentation in the Conditions Decisional State at the time of inconsistent evidence presentations. E = evidence, g = incriminating, ng = exculpatory

irreversible. The critical inconsistent evidence was presented soon after the initial preference rating was done in the pre-decisional presentation condition, but just before the final verdict was made in the post-decisional presentation condition. The orders of evidence presentation in the two conditions were as depicted in Figure 1 (“E” = evidence, “g” = incriminating, “ng” = exculpatory).

After the final verdict, the participants' memory was measured with 22 true or false questions about evidences that the prosecution and the defense attorney may or may not have presented. Eleven questions were about the possible prosecution's evidence, and the other eleven questions were about the possible defense's evidence. The 11 questions about the possible defense's evidence included 3 questions about the inconsistent evidence. The participants were then debriefed and thanked for taking part in the study.

Results

In the initial preference rating, made after the

two strongly incriminating evidence were presented, 258 participants (114 women) preferred the Guilty verdict and 42 (17 women) preferred the Not Guilty verdict. The analysis was focused on the response of the 258 participants who showed the initial preference for Guilty verdict, as the main purpose of this study was to examine whether individuals with the presumption of guilt would change their verdict preference by post-decisional presentation of evidence that is inconsistent with their mental model of the case. The data from the 42 participants with the initial preference for Not Guilty verdict were separately analyzed.

Verdict

Among the 258 participants with the initial Guilty preference, 112 (43.41%) changed their verdict preference in the verdict. Logistic regression analysis with the verdict as the binary response variable showed that the main effect of Decisional Phase on the change of mind was significant ($B = 0.58$; $Wald\ x^2=5.18, p < .05$). 36% (46/127) and 50% (66/131) of the participants changed

their mind in the pre- and the post-decisional presentation conditions, respectively. The main effect of Type was not significant ($B = -.20$; Ward $\chi^2 = 0.61, p = 0.44$). When the inconsistent evidence was the type weakening the prosecution's case, 46% (59/128) changed their mind, and 41% (53/130) changed their mind when the inconsistent evidence was the type supporting the defense's case. The interaction between Decisional Phase and Type of inconsistent evidence did not have a significant effect on the change of mind ($B = 0.52$; Ward $\chi^2 = 1.05, p = 0.31$).

Likelihood of guilt

The participants rated the likelihood of guilt on a percentage scale twice, the first time with the initial preference rating and the second time with the verdict. A mixed three-way analysis of variance with two between-subjects factors of inconsistent evidence (Decisional Phase: pre- or post-decisional presentation; Type: weakening the prosecution or supporting the defense) and one within-subject factor of rating (Order: first or second) showed a significant main effect of Order on the rated likelihood of guilt ($F(1, 254) = 12.29, p < .01, = 0.11$). The mean likelihood of guilt in the first assessment was 73.48 ($SD = 13.71, n = 258$) and that in the second assessment was 65.06 ($SD = 21.30, n = 258$), with 95% CIs of [71.81, 75.15] and [62.46, 67.66] for the respective means. The main effect of Decisional Phase was also highly significant ($F(1, 254) = 7.73, p < .01, = .07$). The mean rated likelihood of guilt was 72.89 ($SD = 20.40, n = 127$) in the pre-decisional presentation condition and 65.89 (SD

$= 20.03, n = 131$) in the post-decisional presentation condition, with 95% CIs of [69.34, 76.44] and [62.46, 69.32] for the respective means. There was neither a significant main effect of Type ($F(1, 254) = 1.00, p = 0.32, = .01$) nor an interaction effect between Decisional Phase and Type ($F(1, 254) = 0.36, p = 0.55, = .00$).

The two-way interaction between Decisional Phase and Order had a significant effect on the rated likelihood of guilt ($F(1, 254) = 5.43, p < .05, = .05$) (Figure 2). The likelihood rated secondly with the verdict, as compared to that rated firstly with the initial preference, decreased more in the post-decisional presentation condition ($M_{change} = -14.08, SD = 26.74, n = 131, 95\% CI [-18.66, -9.50]$) than in the pre-decisional presentation condition ($M_{change} = -2.41, SD = 20.73, n = 127, 95\% CI [-6.02, 1.20]$). The decrease in the pre-decisional presentation condition was not significantly different from zero.

The two-way interaction between Type and Order was marginally significant ($F(1, 254) = 3.45, p = .07, = .03$), with a tendency that the rated likelihood of guilt decreased more with the inconsistent evidence weakening the prosecution's case ($M_{change} = -13.39, SD = 24.38, n = 128, 95\% CI [-17.61, -9.17]$) than with that supporting the defense's case ($M_{change} = -3.73, SD = 24.11, n = 130, 95\% CI [-7.87, 0.41]$). The decrease with the inconsistent evidence supporting the defense's case was not significantly different from zero. There was no significant three-way interaction effect ($F(1, 254) = .07, p = .79, = .00$) on the rated likelihood of guilt.

To interpret the interaction effect shown in Figure 2, the mean changes in the rated

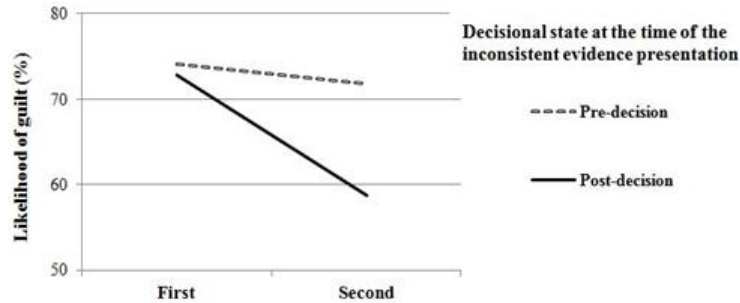


Figure 2. Likelihood of Guilt by the Decisional State at the Time of the Inconsistent Evidence Presentation and the Order of Assessment

likelihood of guilt were obtained separately for the 112 mind changers (those who changed the initial preference of Guilty to the final verdict of Not Guilty) and for the 146 non-changers (those who maintained the initial preference of Guilty in the final verdict). The likelihood of guilt decreased from the first assessment to the second assessment among the mind changers, whereas it increased among the non-changers. The decrease among the mind changers was greater in the post-decisional presentation condition ($M_{change} = -29.73$, $SD = 25.12$, $n = 66$, 95% CI [-35.79, -23.67]) than in the pre-decisional presentation condition ($M_{change} = -19.17$, $SD = 19.87$, $n = 46$, 95% CI [-24.91, -13.43]). The increase among the non-changers was greater in the pre-decisional presentation condition ($M_{change} = 7.32$, $SD = 14.06$, $n = 80$, 95% CI [4.24, 10.40]) than in the post-decisional presentation condition ($M_{change} = 1.58$, $SD = 17.82$, $n = 66$, 95% CI [2.72, 5.88]).

Memory of incoherent evidence

In order to determine whether the patterns of

the change of mind observed in the Decisional Phase conditions can be explained by a simple serial position or timing (i.e., *recency*) effect, the accuracy score of the memory of the inconsistent evidence was compared between the two conditions. No difference in the accuracy score of the memory was found between the two Decisional Phase conditions of inconsistent evidence presentation. With the maximum possible score of 3, the mean memory score for the statements concerning the inconsistent evidence weakening the prosecution's case was 2.73 ($SD = 0.55$, $n = 62$) in the pre-decisional presentation condition and 2.41 ($SD = 0.89$, $n = 66$) in the post-decisional presentation condition, with 95% CIs of [2.59, 2.87] and [2.19, 2.63] for the respective means. The difference was not significant ($t(126) = 1.47$, $p = 0.15$). The mean memory score for the statements concerning the inconsistent evidence supporting the defense's case was 2.56 ($SD = 0.67$, $n = 65$) in the pre-decisional presentation condition and 2.80 ($SD = 0.41$, $n = 65$) in the post-decisional presentation condition with 95% CIs of [2.39, 2.73] and [2.71, 2.89] for the respective means. The mean difference was not

significant ($t(128) = -1.53, p = 0.13$).

3.4. Change of mind in the participants with the initial Not Guilty preference

Among the 42 participants who preferred acquitting the defendant in the initial preference rating, 25 (60%) maintained the Not Guilty preference and 17 (40%) changed their mind to Guilty in the final verdict. Logistic regression analysis with the final verdict as the binary response variable showed that Decisional Phase ($B = 2.14$; Wald $\chi^2=3.33, p = .07$), Type ($B = 0.35$; Wald $\chi^2=.09, p = .77$), and the interaction between them ($B = 1.50$; Wald $\chi^2=0.41, p = 0.52$) had no significant effect on the change of mind. The mean rated likelihood of guilt was 42.53 ($SD = 23.63, n = 42, 95\% CI [35.38, 49.68]$) in the first assessment and 46.76 ($SD = 28.23, n = 42, 95\% CI [38.22, 55.30]$) in the second assessment. Mixed three-way analysis of variance with Decisional Phase, Type, and Order yielded no significant effect of any sort on the rated likelihood of guilt.

Discussion

Jurors tend to establish their own hypothesis about the case (mental model of the case) early in the trial, and process the incoming information to make a verdict decision in a way that supports the hypothesis. This coherence-based reasoning process often results in a decision bias to disregard. The present study was conducted to identify a condition in which jurors become more sensitive to the inconsistent evidence and thus change their mind about the verdict preference

they preliminarily formed. Specifically, it was examined whether individuals with the presumption of guilt in their mental model of the case change their verdict preference more often if the inconsistent evidence is presented during the late part of the decision task when the selection on verdict has been made, as compared to if it is given during the early part of the decision task when the selection is still in being made.

With a relatively large proportion (112/258) of the participants who changed from a Guilty to a Not Guilty preference in the final verdict, the hypothesis of the present study was supported. Change of mind, observed in the verdict preference and in the rated likelihood of guilt, occurred more often and in a larger magnitude when the inconsistent evidence was presented in the post-decisional, as opposed to the pre-decisional, part of the trial, regardless of the type of the inconsistent evidence. In the post-decisional presentation condition, 50% of the participants changed their mind from Guilty to Not Guilty while 36% did so in the pre-decisional presentation condition. Although the size of the effect of the Decisional State may not be overwhelming, it was a meaningful difference not only statistically but also substantively because the changes in the binary response (verdict) were systematically associated with the changes in the rated likelihood of guilt.

Among the participants who changed their verdict preference to Not Guilty ($n = 112$), the post-decisional presentation of the inconsistent evidence caused a larger decrease in the likelihood of guilt than did the pre-decisional presentation of the same evidence ($M_{change} = -29.73$ versus M_{change}

= -19.17); Among the participants who did not change their mind ($n = 146$), on the other hand, the post-decisional presentation of the inconsistent evidence caused a smaller increase in the likelihood of guilt than did the pre-decisional presentation of the same evidence ($M_{change} = 1.58$ versus $M_{change} = 7.32$). The likelihood of guilt decreased among the mind changers but increased among the non-changers; the decrease among the mind changers was greater in the post-decisional presentation condition than in the pre-decisional presentation condition. This pattern of results from the combination of the binary responses and the rated likelihood of guilt indicate that the decisional state at the time of the inconsistent evidence presentation may influence the reassessment of the likelihood of guilt, and that the change of mind is based on the reassessment.

The study also examined the effect that the type of inconsistent evidence might have on the change of mind. The two different types of inconsistent evidence, one weakening the preferred verdict (Guilty), and the other supporting the non-preferred verdict (Not Guilty), were compared to each other in the extent to which they influence a change of mind about the case. It was expected that the degree of conviction in the mind of the decision-maker would be weakened more when the preferred verdict is weakened than when the non-preferred verdict is strengthened. Unlike the decisional state at the time of the inconsistent evidence presentation, the type didn't have a significant effect on the verdict change. It was noted, however, that it had a marginally significant effect ($p = .07$) on the change in the rated likelihood of guilt. The final assessment of

the likelihood of guilt decreased from the first assessment more, as expected, when the inconsistent evidence was the type weakening the prosecution's case than when it was the type supporting the defense's case. It may be because the likelihood of guilt tends to be assessed based more on the incriminating evidence than on the exculpating evidence. It is not clear, however, whether the marginal effect was in fact due to the type or the strength of the inconsistent evidence. Even though the two types of the inconsistent evidence used in the present study appeared from the pilot study to be similar to each other in probative value (reliability and importance), the type of the inconsistent evidence needs to be manipulated independently from the strength of the evidence in future studies.

Among the 42 participants who initially preferred acquitting the defendant in spite of the two preceding pieces of strongly incriminating evidence, the change of mind and the change in the rated likelihood of guilt were not explained by the decisional state or the type of inconsistent evidence. Some of those participants might have been individuals who would not convict a seemingly fictitious defendant in the context of an experiment under any circumstances. The rest of them might have been individuals who, relying on the principle of the presumption of innocence, were reluctant to hurry to convict a defendant with a scant amount of incriminating evidence presented in the early part of the trial. In any case, it is likely that those 42 participants did not form a particular mental model of the case at the time of the initial preference rating and accordingly, the "inconsistent" evidence presented

after the initial preference rating was done was inconsistent with nothing for them. There might have been no mind to be changed, so to speak, by the “inconsistent” evidence in the group. Consequently, the decisional state and the type of the inconsistent evidence could not have any effect on their final decision. 60% of this group maintained Not Guilty in the final verdict. This percentage is close to the percentage (57%) of decision changers among those with the initial Guilty preference. Therefore, the final verdict of the participants with the initial Not Guilty preference may reflect the general characteristics and the overall strength of evidence in the case rather than the impact of the experimental manipulations.

The results shown in Figure 2 cannot be explained as a memory function, or the *recency effect*, which is the tendency to “recall” the last items best. The inconsistent evidence was presented in the post-decisional presentation condition just before the final verdict was made and the likelihood of guilt was finally rated. If the participants in the post-decisional presentation condition had remembered the inconsistent evidence more clearly than had those in the pre-decisional presentation condition, the influence of the inconsistent evidence on the final verdict and the finally rated likelihood of guilt would have been stronger in the former condition than in the latter condition. The interval on the time at which the inconsistent evidence was presented in the two decisional state conditions was approximately 10 to 15 minutes, which may be a relatively short interval to cause a difference in the memory contents about the inconsistent

evidence. When tested with memory questions at the end of the experiment, the accuracy score for the memory of the inconsistent evidence was not different between the two conditions of Decisional State. That means that the difference in the extent to which participants change their verdict preference was a perception-based (e.g., perceived importance and reliability of the evidence, its perceived applicability for the final verdict), instead of a memory-based difference. Therefore, the alternative interpretation of the results based on the assumption of recency effect can be ruled out.

The finding of the present study is consistent with the psychological observations that important but inconsistent information could be downplayed in the pre-decisional phase of decision-making that may be dominated by automatic and intuitive mode of information processing (Carlson & Russo, 2001; Simon, Pham, Le, & Holyoak, 2001), but that the information may be considered on its own right if it is presented in the post-decisional phase in which meta-cognitive and deliberative processing would override the intuitive processing of information (Janis & Mann, 1977; Svenson, 1992; Orbell & Sheeran, 2000; Gollwitzer et al., 1990; Krupnikov, 2011). The results are also consistent with the neurological theory of decision-making that posits that the change of decision in the decision variable could occur easily if important inconsistent information is brought about after the momentum (drift rate) of the accumulation of evidence to a decision bound is saturated.

The finding of the present study may have practical implications for jury trials when the case is equivocal. In the present study, 86% (256/300)

of the participants were led to form the presumption of guilt in the early stage of the trial, but 54% (163/300) of the participants eventually decided to convict the defendant in the final verdict. The overall reduction in the decision to convict indicates that the experimental manipulations of the evidence effectively weakened the degree of conviction in the minds of the participants. When the case is more heavily leaned toward conviction and the mental model of the case formed by the jurors during the trial is sturdy, those jurors with the presumption of guilt may be less amenable by inconsistent information presented in the post-decisional phase of the trial process. Therefore, future studies should probe into the impact of post-decisional presentation of inconsistent evidence on juror's sensitivity to the evidence and change of mind in more and less obvious cases under the same experimental design.

A limitation of the current study involves the unclearness concerning what participants were doing from the time of the initial preference rating until the final verdict. Additional studies with various versions of the current experimental design are needed to fully understand the current findings. The process of decision formation could be observed by gathering information and judgments more often during the presentation of the evidence or examining changes in attitudes toward the defendant when different types of evidence are presented. Moreover, further research with more participants with various ages and occupations is needed to generalize the findings of the study to decisions in the real world.

Conclusion

Through the focus on decisional phase of exposure to the evidence that is inconsistent with preferred verdict, the present study demonstrated a condition that may increase a juror's sensitivity to inconsistent evidence and readiness to change their mind about the case. Given that the jurors tend to heavily rely on coherence-based reasoning, and so often distort the information and decide on the verdict in accordance with the initially preferred verdict, the finding of this study have important implications for the jurors' decisions. Because people assume that their existing beliefs are true, those beliefs serve as a heuristic for processing information and making judgments. Most pre-decisional individuals are unaware that they may be involved in biased information processing. The present study suggests that a jurors' readiness to change their mind increases in the post-decisional phase. If the individuals' decisional state at which inconsistent evidence is presented is considered, we may know when the jurors' tendency to conform to coherence-based reasoning can or cannot be attenuated.

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반박증거의 제시시점에 따른 배심원의 판단 변화

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“일관성 기반 논증(coherence-based reasoning)” 이론에 의하면 배심원들은 판단 초기에 사건에 대하여 잠정적인 가설 혹은 정신적 표상을 구성하고 이 가설 혹은 표상에 부합하는 방식으로 증거들을 해석하고 판단하여 유무죄 판단에 반영을 하는데, 표상에 반대되는 증거는 무시하거나 왜곡하는 경향이 있다. 본 연구는 인간의 의사결정에 관한 심리학적, 신경생물학적 이론들을 토대로 반박증거(incoherent evidence)가 판단이 이루어진 후에 제시되면, 아직 판단이 형성되고 있는 과정에 제시되는 경우에 비하여 배심원의 판단에 더 많은 영향을 끼쳐 소위 마음 바꾸기(change-of-mind)가 더 많이 일어날 것이라 가정하고, 이를 확인하고자 실시되었다. 배심원으로서의 자격이 주어지는 300명의 성인 남녀가 4 가지 실험 조건 - 2(반박 증거 제시시점: 초반 v. 후반) x 2(반박증거 종류: 유죄탄핵증거 v. 무죄지지증거) 중 하나에 무작위로 할당되어, 유죄심증이 강한 한 형사사건의 공판내용과 9개의 유무죄 증거들을 읽은 후 피고인에 대하여 유무죄 판단을 내리도록 지시를 받았다. 참가자들은 모두 과제의 초반부에 잠정적인 유무죄 판단(1차 판단)을 내렸는데 조건에 따라 강력한 무죄증거(반박증거)를 1차 판단 직후, 혹은 최종 유무죄 판단 직전에 읽었다. 또한 반박증거는 조건에 따라 유죄를 탄핵하는 증거 혹은 무죄를 지지하는 증거로 나뉘어서 제시되었다. 반박증거가 앞에 제시되는 조건의 참가자들이 뒤에 제시되는 조건의 참가자들에 비해서 최종 판단에서 유죄에서 무죄로 마음을 더 바꾸는 경향이 있었으며, 반박증거가 유죄증거를 직접적으로 탄핵하는 경우에 참가자들의 마음이 더 많이 바뀌는 경향이 있었다.

주요어: 배심원 의사 결정, 마음 바꾸기, 반박 증거