

QOG WORKING PAPER SERIES 2005:4

Exploring a Causal Relationship between Vertical and Horizontal Trust

Daniel Eek
Bo Rothstein

ISSN 1653-8919

THE **QOG** INSTITUTE

QUALITY OF GOVERNMENT



GÖTEBORG
UNIVERSITY

QOG
WORKING
PAPER SERIES
available at:
www.qog.pol.gu.se

Abstract

Three experiments investigating how a possible causal relationship works between vertical trust (i.e., trust in authorities) and horizontal trust (i.e., trust in others) are reported. In Experiment 1, 40 undergraduate students read and responded to several scenarios describing fictitious events in a foreign society. Based on their effects on trust, the scenarios were hypothesized to be grouped into the following four categories; positive effects on vertical trust, negative effects on vertical trust, positive effects on horizontal trust, and negative effects on horizontal trust. In different participant groups, subsequent to each scenario, participants' levels of vertical or horizontal trust were assessed. As hypothesized, different scenarios had reliable effects on the two forms of trust. In Experiment 2, 64 undergraduates read the most effective scenarios from Experiment 1 and responded to how participants' levels of vertical and horizontal trust were affected by the scenarios. Results supported the hypothesized causal relationship from vertical to horizontal trust when trust levels were decreased, but not when trust levels were increased. Results of Experiment 3, where another 48 undergraduates participated, verified that the strength of the causal effect of vertical trust on horizontal trust depends on whether trust is increased or decreased. In conclusion, the results from the three experiments indicate that increased vertical trust has positive effects on horizontal trust, decreased vertical trust has smaller negative effects on horizontal trust, and horizontal trust has no effects on vertical trust.

Key words: vertical trust, horizontal trust, social trust, social capital

Exploring a Causal Relationship Between Vertical and Horizontal Trust

Research on trust in authorities and trust in others have for a long time interested researchers. Trust in authorities is typically labeled *political* or *vertical trust*. Trust in others is normally called *social* or *horizontal trust* and it is closely connected to *social capital*, a term that often is used to describe citizens' levels of horizontal trust and network activities in different societies (Hooghe & Stolle, 2003; Prakash & Selle, 2004; Putnam, 2002). From various disciplines, researchers approach the study of people's trust in different ways. For instance, social psychologists' research on trust predominantly focuses on people's propensity to obey the law implemented by different authorities (e.g., the police) (e.g., Tyler & Lind, 1992), and relates the propensity to obey to concepts within research on social justice. This line of research indicates that people's willingness to obey the law, and to trust the authorities implementing the laws, is closely related to whether they consider that they have been fairly treated by the authorities, both in terms of procedures and outcomes (Tyler & Lind, 1992). Perhaps the most replicated finding in this stream of research is that if authorities allocate outcomes according to procedures that are regarded as fair, recipients are more willing to voluntarily accept the outcomes they receive from the authorities. This finding is referred to as *the fair process effect* (e.g., Van den Bos, Lind, Vermunt, & Wilke, 1997; Van den Bos, Vermunt, & Wilke, 1997). Thus, recipients judge the outcomes they are allotted through fair procedures as better than outcomes they receive from unfair procedures, even if the substantial (distributive) own outcome is negative. Procedural fairness concerns are closely related to trust concerns. For instance, Van den Bos, Wilke, and Lind (1998) found that perceived procedural fairness is only relevant for

judging the outcomes received when people lack information about whether or not the authority can be trusted. When participants knew whether or not they could trust the authority, procedural fairness was not important for judging the outcomes.

Another important stream of research treats trust as an important parameter in understanding citizens' societal behavior. Here, it is common to measure the level of social capital (i.e., horizontal trust) in representative samples of different nations. Yamagishi (e.g., Yamagishi, 1986) has developed one frequently used tool to measure people's levels of horizontal trust. With the use of this measure, Yamagishi has found that many behavioral differences exist between those characterized as low-, medium-, and high-trusters by the trust-scale. The scale has also contributed to an increased understanding of national differences in the relationship between people's horizontal trust and their willingness to cooperate with one another (Yamagishi & Yamagishi, 1994).

It is desirable for a society that its citizens have high horizontal trust levels. The reason is that horizontal trust correlates with many positive societal outcomes. For instance, societies characterized by high levels of horizontal trust have a larger economic growth (Knack & Keefer, 1997; Woolcock, 1998), have more well-functioning democratic processes (Putnam, 1993), have happier and healthier citizens (Helliwell, 2002), and they have more often effective redistributions from richer to poorer citizens (Uslaner, 2002). Most importantly for the aim of this article is, however, that in such societies, where citizens have high levels of horizontal trust, citizens have also high levels of vertical trust (REF). Thus, results from survey data indicate that people's vertical trust levels correlate positively with their horizontal trust levels. For long, researchers have been interested in trying to understand what underlies this

relationship (Gambetta, 1988; Luhmann, 1979; Pharr & Putnam, 2000; Rotter, 1971), and this is the focal point of the research reported herein.

The positive correlation between the two forms of trust could suggest that people fail to distinguish between the vertical trust and the horizontal trust, and treat both of them simply as trust. However, results indicate that people actually do treat the two forms of trust differently. For instance, survey data shows that the variance in people's vertical trust is much larger than the variance in people's horizontal trust (Rothstein, 2002). More importantly, however, survey data also shows that in periods where vertical trust (in Sweden) has decreased, horizontal trust has remained high (Holmberg & Weibull, 2004, Kumlin & Rothstein, 2005). Thus, the purpose of the present research is to try to illuminate how this positive relationship is to be understood.

Given the many positive things that come with high levels of horizontal trust in a society, it is important to study how high levels of horizontal trust can be obtained in a society. Similarly, to protect certain societies characterized by high levels of horizontal trust, it is important to study what causes high levels of horizontal trust to decrease in a society. In order to study the causality between vertical and horizontal trust, it is first important to find out what those factors are that cause people to trust authorities and others, and under what circumstances people will not trust authorities and others. When such factors have been located, vertical and horizontal trust can be induced through experimental manipulation, and a possible causality between them can be investigated. This is the purpose of the present research.

Some researchers, thus, argue that the relationship between the two forms of trust is causal (e.g., Rothstein & Stolle, 2003) and debate on what direction the causality works (Uslaner, 2004). Putnam (1993) argues that high vertical trust stems from

people's horizontal trust mounted up through participation in voluntary associations. However, although this hypothesis has been tested, it has not received any direct support (Delhey & Newton, 2003; Uslaner, 2002). In the present research, it is argued that it is more likely that horizontal trust is caused by vertical trust. The logic is that when people lose their trust in a person representing an important institution (i.e., an authority), they reason that if the authority is a "bad" (e.g., immoral, unfair, untrustworthy) person, than other people might just as well be equally "bad". For instance, if an authority does not obey the law, why should anyone else bother? We argue that it is not equally logical that it should work the other way around. For instance, if someone else on the street is a "bad" person, it does not necessarily suggest anything about authorities. Hence, our main hypothesis is that vertical trust affects horizontal trust.

In an experimental study, Eek and Rothstein (2004) located important factors for people's vertical and horizontal trust. They used scenarios to describe other people's encounters with authorities and asked participants to indicate whether or not their vertical and horizontal trust were influenced by what they imagined that they were observing. For instance, they found that when an authority (e.g., a doctor or a police man) accepted a bribe in order to provide help to another person, it had damaging effects on people's vertical and horizontal trust. On the contrary, when the authority refused to accept an offered bribe, it had positive effects on vertical trust and negative effects on trust in the person offering the bribe. The results also indicated that trust in the people that was being observed, spread to other people who were not present in the scenarios. Thus, Eek and Rothstein found important factors that increase and decrease

levels of trust, and their results gave indirect support for causality between the two forms of trust.

We present three experiments aiming at testing the causal mechanism between vertical and horizontal trust. Our hypothesis is that changes in vertical trust cause changes in horizontal trust. We use a similar experimental approach as Eek and Rothstein (2004). Thus, in Experiment 1, we used scenarios that were similar to those used by Eek and Rothstein (2004) in order to cause either positive or negative effects on either vertical or horizontal trust. Experiment 2 was designed in a way that made possible to directly test the hypothesis about causality. Thus, we picked the most effective scenarios from Experiment 1 to induce positive and negative effects on horizontal and vertical trust. The results gave support for the hypothesis when trust was decreased, but not when trust was increased. Experiment 3 was mainly conducted to test an alternative explanation to the results of Experiment 2, and the results gave further support for a causal mechanism from vertical to horizontal trust that depends on whether trust is increased or decreased.

Experiment 1

Method

Participants. Forty undergraduates at different educational programs at Göteborg University participated in the experiment. Twenty were men with a mean age of 25.0 years ($SD = 4.5$) and 20 were women with a mean age of 24.9 years ($SD = 5.8$). Participants were promised SEK 50 (approximately US\$ 7.5) in return for their participation, and were randomly assigned to one of two between-subjects conditions with equal numbers of male and female participants.

Procedure and Materials. Participants were contacted through telephone calls from an available pool of participants. They were invited to the laboratory to participate in a study about decision making. On arrival to the laboratory, participants were met by a male experimenter and seated in private booths where they were asked to complete the experimental materials.

The experimental material consisted of a questionnaire including 21 pages. On the first page, participants were instructed that they would be asked to imagine that they were on a journey in a foreign society, and to respond to a number of questions in relation to different scenarios that would be described (cf. Eek and Rothstein, 2004). Lastly on the first page, participants were requested to indicate their age and sex and were informed that their responses in the questionnaire were anonymous.

Instructions for the scenarios asked participants to imagine that they were on a journey in a foreign society (“Society X”). Several scenarios would be presented, each describing a “typical occurrence” in Society X. Participants were asked not to do any comparisons between the different scenarios, but to treat every scenario in its own light. In relation to each scenario, described on separate pages in the questionnaire, participants were asked to respond to questions measuring their degree of trust in either different authorities or in other people in general. This constituted the between-subjects manipulation. Thus, one group (henceforth referred to as “*horizontal group*”) responded to what degree they thought that other people in general in Society X could be trusted, whereas the other group (henceforth referred to as “*vertical group*”) responded to what degree they thought that the police, the judges, the lawyers, the prosecutors, and the government in Society X could be trusted. Hence, for the horizontal group, the following two questions were posed subsequent to each scenario (translated from

Swedish): “Given the scenario, to what extent do you trust other people in general in Society X?” and “To what extent has your trust in other people in general in Society X changed as an effect of the scenario?”. For the vertical group, the corresponding questions read: “Given the scenario, to what extent do you trust the police in Society X?” and “To what extent has your trust in the police in Society X changed as an effect of the scenario?”. In addition to questions about the police, this group also responded to corresponding questions concerning trust in judges, lawyers, prosecutors, and the government.

Participants rated their degree of trust on separate rows of 5-point Likert scales. The different points on the scales were labeled in the following way: “Very low trust”, “Pretty low trust”, “Neither low nor high trust”, “Pretty high trust”, and “Very high trust”, respectively. The questions measuring change in trust used 9-point rating scales where the endpoints were defined as “I have a much lower degree of trust” (-4) and “I have a much higher degree of trust” (4), respectively. The midpoint was defined as “My degree of trust has not changed” (0).

The order of responding to the two questions was counterbalanced in both groups. Thus, half the participants in both groups answered the question measuring their degree of trust before the question of to what extent their degree of trust had changed, the other half in the reverse order.

On the following pages in the questionnaire participants read and responded to in total 20 scenarios, which were grouped into four categories with regard to their hypothesized effects on vertical and horizontal trust (cf. Eek & Rothstein, 2004). There were five scenarios in each category. One category was hypothesized to have negative effects on horizontal trust. For instance, one scenario¹ in this category read (translated

from Swedish): “You are out walking in Society X. You see a man dropping his wallet without notice. The person walking behind the man picks up the wallet, puts it in his own pocket, turns around, and starts walking fast in the opposite direction.” Another category was hypothesized to have positive effects on horizontal trust. As an example, one scenario in this category read: “You have done some shopping in Society X and you have just left the store. The cashier calls you back and says that she mistakenly gave you too little change back. She gives you the additional change and apologizes.” A third category was hypothesized to have negative effects on vertical trust. For instance, one scenario read: “One morning in Society X you read in the morning paper that several police officers are suspected to be involved in drug related crimes. On good grounds, they are assumed to have made a lot of money on selling confiscated drugs.” Finally, the fourth category of scenarios was hypothesized to affect vertical trust positively. As an example, a scenario read: “You have been robbed in Society X and go to the police to make a report. You believe that you can give a good description of the mugger. The next day you are contacted by the police officer. He informs you that they have the mugger in custody.” Four random orders of presentation of the different scenarios were generated. These were used an equal number of times in both groups.

Completing the questionnaire required about 30 minutes, after which participants were paid and debriefed.

Results and Discussion

One participant in the horizontal group did not complete the questionnaire properly and was therefore discarded from the analyses. Order of presentation of the different scenarios and the response scales, respectively, as well as sex were included as independent variables in an initial analysis of variance (ANOVA) on participants’

ratings of trust and changes in trust, respectively. No effects were significant. Therefore, sex and order of presentation were excluded from further analyses.

The analysis on trust level gave similar results as the analysis on trust change. However, the results were clearer in the analysis on trust change than in the analysis on trust level, much due to ceiling effects in the analysis on trust level (i.e., we used 5-point scales to measure trust level and 9-point scales to measure trust change). Therefore, only the analysis of trust change will be reported.

Means of participants' ratings of to what extent their trust was modified by the separate scenarios in the four categories are displayed in Table 1 in relation to the experimental manipulation. As the scale ranged from -4 to 4, negative figures indicate that trust was decreased, and positive figures indicate that trust was increased.

Insert Table 1 about here

As may be seen, scenarios that were hypothesized to decrease trust decreased trust and scenarios that were hypothesized to increase trust increased trust. Furthermore, scenarios hypothesized to affect vertical trust had larger effects on vertical trust than on horizontal trust. Similarly, scenarios hypothesized to affect horizontal trust had larger effects on horizontal than on vertical trust. These patterns were true with no exceptions.

A 2 (experimental group: horizontal group vs. vertical group) by 2 (trust type: horizontal trust vs. vertical trust) by 2 (trust change: increased trust vs. decreased trust) by 5 (scenario: scenario 1 vs. scenario 2 vs. scenario 3 vs. scenario 4 vs. scenario 5) analysis of variance (ANOVA) with repeated measures on the three last factors was conducted in order to test the significance of the results.

The main effect of trust type, $F(1, 37) = 55.06, p < .001, \eta_p^2 = .60$, indicated that scenarios hypothesized to affect vertical trust had larger effects on trust ($M = -.63$) than had scenarios hypothesized to affect horizontal trust ($M = -.07$). The main effect of trust change, $F(1, 37) = 347.85, p < .001, \eta_p^2 = .90$, indicated that scenarios hypothesized to increase trust had higher average ratings ($M = 1.11$) than did scenarios hypothesized to decrease trust ($M = -1.82$). The two-way interaction effect between trust type and trust change, $F(1, 37) = 49.39, p < .001, \eta_p^2 = .57$, indicated that for scenarios hypothesized to affect vertical trust, the difference between scenarios hypothesized to increase trust and those hypothesized to decrease trust was larger ($M = 1.24$ and $M = -2.51$, respectively) than for scenarios hypothesized to affect horizontal trust ($M = .98$ and $M = -1.12$, respectively).

Note that the effects presented so far have not included the between-subjects manipulation. Thus, they have not taken into account whether horizontal or vertical trust was measured. Therefore, it was essential that the two-way interaction effect between trust type and trust change was qualified by a significant three-way interaction effect between trust type, trust change, and experimental group. The analysis revealed that this indeed was the case, $F(1, 37) = 107.54, p < .001, \eta_p^2 = .74$. As illustrated in Figure 1, the vertical group was more affected by scenarios hypothesized to affect vertical trust than by scenarios hypothesized to affect horizontal trust. On the contrary, the horizontal group was more affected by scenarios hypothesized to affect horizontal trust than by scenarios hypothesized to affect vertical trust.

Insert Figure 1 about here

In conclusion, results of the ANOVA indicated that we through the different scenarios successfully managed to cause changes in vertical and horizontal trust, respectively. The main effect of the replication factor scenario, $F(4, 148) = 6.31, p < .001, \eta_p^2 = .15$, as well as interaction effects between scenario and the other two within-subject factors were, however, also significant. These effects indicated that participants' levels of trust changed in different degrees by scenarios within the same scenario categories. Given that the main aim of Experiment 1 was to find suitable scenarios to test a causal relationship between vertical and horizontal trust in Experiment 2, it was essential to detect and eliminate scenarios that did not cause a change in trust as hypothesized. Therefore, separate Bonferroni corrected one-sample t -tests at $p = .05$ with a test value of 0 were performed for both groups' ratings of changes in trust from the 20 scenarios. The tests indicated that all scenarios but one (Scenario 4 in the scenario category that was expected to cause an increase in vertical trust) successfully caused a change in trust in the hypothesized way. Therefore, this scenario was replaced by a new scenario which was written in a similar way as the most effective scenario in the same scenario category.

Experiment 2

In Experiment 1, scenarios that had been developed in order to cause changes in vertical and horizontal trust were tested. Based on the results of the analyses, we now have experimental material that reliably affects the two forms of trust. Furthermore, we can separate material that induces positive effects on trust from material that produces negative effects on trust.

The aim of Experiment 2 was to test whether the relationship between the two forms of trust is causal, and, if so, in what direction the causal mechanism works. We

believe that it is more likely that vertical trust influences horizontal trust than the reverse. We also believe that the causality works in the same way for increased and decreased trust.

Participants in Experiment 2 were asked to read the scenarios in one of the scenario categories from Experiment 1. Thus, in different groups, either positive effects on vertical trust (this group will henceforth referred to as *vertical increase*), negative effects on vertical trust (henceforth referred to as *vertical decrease*), positive effects on horizontal trust (henceforth referred to as *horizontal increase*), or negative effects on horizontal trust (henceforth referred to as *horizontal decrease*) were induced. Subsequently, vertical trust and horizontal trust were measured for all participants. Given that we used four groups of participants, we could test both possible directions of causality, and we could test whether the causality works in a similar way for increased and decreased trust levels.

If our hypothesis is true, that vertical trust causes horizontal trust, and that the causality is the same for increased and decreased trust, we should expect horizontal trust levels to be the same no matter if horizontal or vertical trust has been induced. We should also expect higher levels of horizontal trust when trust has been increased compared to when trust has been decreased. Thus, for horizontal trust, we hypothesized $Horizontal\ increase = Vertical\ increase > Horizontal\ decrease = Vertical\ decrease$.

For vertical trust, if our hypothesis is correct, we should expect groups in which vertical trust has been induced to differ in trust from groups where horizontal trust has been induced. More specifically, the latter groups' ratings of vertical trust should be unaffected by the manipulation. Thus, for vertical trust, we hypothesized $Vertical\ increase > Horizontal\ increase = Horizontal\ decrease > Vertical\ decrease$.

Method

Participants. Sixty four undergraduates at different educational programs at Göteborg University participated in the experiment. Thirty three were men with a mean age of 24.3 years ($SD = 4.6$) and 31 were women with a mean age of 24.8 years ($SD = 4.7$). Participants were promised SEK 50 (approximately US\$ 6.5) in return for their participation, and were randomly assigned to one of four between-subjects conditions. One group consisted of 9 male and 7 female participants. The remaining groups consisted of 8 males and 8 females.

Procedure and Materials. The recruitment of participants was done in the same way and from the same pool of participants as in Experiment 1. On arrival to the laboratory, participants were welcomed by a male experimenter and seated in private booths where they were asked to complete a questionnaire consisting of seven pages. On the first page, participants were instructed that they on the following pages would be asked to imagine that they were on a journey in a foreign city in an unknown country, and to respond to a number of questions in relation to different scenarios that would be described. Lastly on the first page, participants were requested to indicate their age and sex and were informed that their responses in the questionnaire were anonymous.

On the following pages in the questionnaire participants in four different groups read five scenarios each. The scenarios were selected from the experimental material used in Experiment 1 and from the analyses of Experiment 1 known to induce an increase in vertical trust, a decrease in vertical trust, an increase in horizontal trust, or a decrease in horizontal trust.

The scenarios were presented on separate pages in the questionnaire. Subsequently to each scenario, participants were asked to assess to what extent their

trust in various authorities and in other people were affected by the scenario. In addition, all five scenarios in each category were also presented simultaneously on a separate page in the questionnaire, and participants were asked to answer the same questions once again, now in relation to all scenarios. Participants responded to the questions measuring change in trust on 9-point rating scales where the endpoints were defined as “I have a much lower degree of trust” (-4) and “I have a much higher degree of trust” (4), respectively. The midpoint was defined as “My degree of trust has not changed” (0).

The order of responding to the questions measuring either change in vertical trust or change in horizontal trust was counterbalanced in all groups. Thus, half the participants in each group answered the question measuring change in vertical trust before the question measuring change in horizontal trust, the other half in the reverse order.

Completing the questionnaire required about 20 minutes, after which participants were paid and debriefed.

Results and Discussion

Order of presentation of the scenarios and the response scales and sex were included in initial analyses on participants’ changes in trust. No effects were found of these factors.

Means of participants’ ratings of to what extent their vertical and horizontal trust were modified by the separate scenarios are displayed in Table 2 in relation to the experimental manipulation inducing different changes in trust. Means for vertical trust correspond to the mean of changed trust in the three different authorities, the police,

judges, and the government. As the scale ranged from -4 to 4, negative figures indicate that trust was decreased, and positive figures indicate that trust was increased.

Insert Table 2 about here

Means were subjected to a 4 (experimental group: horizontal decrease vs. horizontal increase vs. vertical decrease vs. vertical increase) by 2 (trust: horizontal vs. vertical) by 5 (scenario: scenario 1 vs. scenario 2 vs. scenario 3 vs. scenario 4 vs. scenario 5) ANOVA with repeated measures on the last two factors. The main effect of experimental group, $F(3, 60) = 53.45, p < .001, \eta_p^2 = .73$, and follow-up Bonferroni corrected t -tests at $p = .05$, indicated that trust was lower (i.e., decreased to a higher extent) for the groups horizontal decrease ($M = -1.34, SD = .66$) and vertical decrease ($M = -1.32, SD = .56$) as compared to the group vertical increase ($M = .13, SD = .58$). Furthermore, trust was higher for the group horizontal increase ($M = 1.15, SD = .82$) than for the other three groups.

As expected from our hypothesis, this main effect was qualified by a significant interaction effect between experimental group and trust, $F(3, 60) = 35.84, p < .001, \eta_p^2 = .64$. For horizontal trust, we hypothesized *Horizontal increase = Vertical increase > Horizontal decrease = Vertical decrease*. Thus, we expected that the level of horizontal trust should not differ between the groups horizontal increase ($M = 1.91, SD = 1.18$) and vertical increase ($M = -.56, SD = .81$). The hypothesis was not supported given that Bonferroni corrected t -tests at $p = .05$ showed that the two means differed. We expected a higher horizontal trust for the group vertical increase than for the group horizontal decrease ($M = -2.06, SD = .91$), which was verified in the follow-up t -tests. Finally, we

expected no difference in horizontal trust between the groups horizontal decrease and vertical decrease ($M = -.99, SD = .74$). However, the follow-up t -tests showed that the means did differ.

For vertical trust, we hypothesized *Vertical increase > Horizontal increase = Horizontal decrease > Vertical decrease*. Thus, a higher trust level was expected in the vertical increase ($M = .82, SD = .65$) than in the group horizontal increase ($M = .40, SD = .67$). This difference was not significant in Bonferroni corrected t -tests at $p = .05$. We expected the same levels of trust in the groups horizontal increase and horizontal decrease ($M = -.61, SD = .61$). However, the difference between the groups was significant. Finally, we expected vertical trust to be higher in horizontal decrease than in vertical decrease ($M = -1.64, SD = .90$), which was supported in the follow-up t -tests.

The main effect of the replication factor scenario, $F(4, 240) = 6.20, p < .001, \eta_p^2 = .09$, as well as interaction effects between scenario and the other factors were also significant. These effects indicated that participants' levels of trust changed in different degrees by scenarios within the same scenario categories, and that these differences also varied between the experimental groups. However, given that we used different orders of presenting the scenarios and that order of presentation had no effects, the effects of the replication factor scenario is not possible to interpret. Furthermore, separate ANOVAs on each of the scenarios only indicated that the effects of the different factors varied with regard to strength, not with regard to direction.

A corresponding 4 (experimental group: horizontal decrease vs. horizontal increase vs. vertical decrease vs. vertical increase) by 2 (trust: horizontal vs. vertical) ANOVA with repeated measures on the last factor was performed on participants' ratings of changes in the two forms of trust when all five scenarios were presented

simultaneously. Means are provided in Table 2. The analysis yielded a significant main effect of experimental group, $F(3, 60) = 57.03, p < .001, \eta_p^2 = .74$. Bonferroni corrected t -tests at $p = .05$ showed that the means of changes in vertical and horizontal trust for the groups vertical decrease ($M = -1.98, SD = .96$) and horizontal decrease ($M = -2.02, SD = 1.03$) did not differ. Changes in trust were significantly higher for the group vertical increase ($M = .18, SD = 1.05$), and even higher for the group horizontal increase ($M = 1.84, SD = .91$). As hypothesized, the two-way interaction effect between experimental group and trust was significant, $F(3, 60) = 37.89, p < .001, \eta_p^2 = .65$. In the follow-up Bonferroni corrected t -tests, it was revealed that horizontal trust was higher in horizontal increase ($M = 2.94, SD = 1.18$) than in vertical increase ($M = -1.12, SD = 1.63$), and that horizontal trust was higher in vertical increase than in the group horizontal decrease ($M = -2.75, SD = 1.24$) and vertical decrease ($M = -1.69, SD = 1.49$). In line with what was expected, means for the latter two groups did not differ.

In the corresponding t -tests for vertical trust it was found that vertical trust increased equally much in the groups vertical increase ($M = 1.48, SD = .79$) and horizontal increase ($M = .75, SD = .95$), but significantly more than in the groups horizontal decrease ($M = -1.29, SD = 1.20$) and vertical decrease ($M = -2.27, SD = .94$). Contradictory to what was expected, means for the latter two groups did not differ significantly.

In sum, we received weak support for our hypothesis when comparing the mean change in vertical and horizontal trust, respectively, between the four groups. Again, for horizontal trust, we hypothesized $Horizontal\ increase = Vertical\ increase > Horizontal\ decrease = Vertical\ decrease$. The analysis based on the means of participants' responses to each and every of the five scenarios showed that $Horizontal\ increase >$

Vertical increase > Horizontal decrease < Vertical decrease. The analysis based on the simultaneous presentation of the five scenarios showed that *Horizontal increase > Vertical increase > Horizontal decrease = Vertical decrease*. Thus, the hypothesized relation between the groups horizontal increase and vertical increase was not supported in any of the analyses, the hypothesized relation between the groups vertical increase and horizontal decrease was supported in both analyses, and the hypothesized relation between the groups horizontal decrease and vertical decrease was supported once.

For vertical trust, we hypothesized *Vertical increase > Horizontal increase = Horizontal decrease > Vertical decrease*. The analysis based on the means of participants' responses to each and every of the five scenarios showed that *Vertical increase = Horizontal increase > Horizontal decrease > Vertical decrease*. The analysis based on the simultaneous presentation of the five scenarios showed that *Horizontal increase = Vertical increase > Horizontal decrease = Vertical decrease*. Thus, only one relation between groups was verified, and that was the relation between the groups horizontal decrease and vertical decrease.

Taken together, our hypothesis that vertical trust affects horizontal trust received some support when trust was decreased. No support was found when trust was increased.

Separate Bonferroni corrected paired sample *t*-tests at $p = .05$ were performed on the mean of participants' ratings of trust change for each of the scenarios to test our hypothesis within the four experimental groups.² Given that the hypothesis states that vertical trust affects horizontal trust, changes in vertical trust should differ from changes in horizontal trust when horizontal trust is manipulated, but not when vertical trust is manipulated. Significant differences between changes in horizontal trust and changes in

vertical trust were as expected found for the groups horizontal increase ($M = 1.91$ for horizontal trust vs. $M = .40$ for vertical trust) and horizontal decrease ($M = -2.06$ for horizontal trust vs. $M = -.61$ for vertical trust). Here, horizontal trust was reliably manipulated and vertical trust was unaffected by the manipulation. For the group vertical decrease, the means ($M = -.99$ for horizontal trust vs. $M = -1.64$ for vertical trust) did not differ, and the hypothesis was thus supported also for this group. Hence, when vertical trust was decreased as an effect of the manipulation, horizontal trust also decreased to the same extent. However, against what was expected, the means differed for the group vertical increase ($M = -.56$ for horizontal trust vs. $M = .82$ for vertical trust). There are two possible reasons as to why the hypothesis was not verified for this group. First, it may be that the hypothesized causal relationship between the two forms of trust only is true when trust is decreased, not when it is increased. Second, the experimental material used for manipulation in this group may be biased since does not only include descriptions authorities, but also of “other people.” As the scenarios read for this group, it may be quite understandable why horizontal trust decreased as an unexpected effect of the manipulation rather than, as hypothesized, increased as an effect of an increased vertical trust. Thus, participants in this group may have based their horizontal trust on the “other people” being described in the scenarios. If this is true, it is equally possible that the results for the group vertical decrease, which verified the hypothesis, can be explained by that participants in this group also based their horizontal trust on the “other people” being described in the scenarios rather than by a decreased vertical trust. Experiment 3 aimed at illuminating the validity of these two explanations.

Experiment 3

With one exception, the pattern of the results of Experiment 2 actually verified the hypothesis within and between groups, although the effects between groups often were not significant. The exception was that, against the hypothesis, horizontal trust actually decreased for the group vertical increase. Horizontal trust was expected to increase in this group as a causal effect of the increased vertical trust. It is, however, likely that the problem occurred because participants in this group based their horizontal trust on the other person causing some kind of damage in the scenarios, rather than on the helpful and trustworthy authority. Thus, for example, the participant imagining being mugged or imagining someone breaking in at their hotel room characterized the scenarios used for manipulation in this group. In all cases, the police managed to arrest the person, and participants' degree of vertical trust increased. However, participants' degree of horizontal trust decreased. This decrease had probably nothing to do with the increase in vertical trust, but with distrust in the offender described in the scenarios.

The same explanation may also be true for participants in the group vertical decrease. Thus, in this group, participants' decreased horizontal may be explained by distrust in the other people being described in the scenarios rather than, as hypothesized, by a decrease in vertical trust. Therefore, in Experiment 3, new scenarios were developed for the groups vertical increase and vertical decrease. Here, trustworthy or untrustworthy characteristics, respectively, were mentioned about the authority without mentioning anything about "other people."

Method

Participants. Another forty eight undergraduates at different educational programs at University of Skövde participated in the experiment. Twenty four were men with a mean age of 26.4 years ($SD = 4.6$) and 24 were women with a mean age of 25.0 years

($SD = 3.7$). Participants were promised a movie pass in return for their participation, and were randomly assigned to one of four between-subjects conditions with equal numbers of male and female participants.

Procedure and Materials. Students attending classes were asked whether they wanted to participate in a study on decision making and interpersonal trust. They were guaranteed anonymity. Those who agreed to participate completed the experimental material immediately after class. They were monitored by a male experimenter.

The experimental material consisted of a questionnaire. The same between-subjects groups were used as in Experiment 2. For the groups horizontal increase and horizontal decrease the same questionnaires were used as in Experiment 2. For the groups vertical increase and vertical decrease, however, the scenarios from the corresponding groups in Experiment 2 had been replaced by other scenarios where “other people” were excluded from the descriptions. Thus, in the group vertical increase, the scenarios did not describe situations where someone had committed a crime or similar unwanted behaviors. Instead, positive vertical trust was induced through police or other authorities being described as people who are helpful and kind. For instance, one scenario for this group read: “While driving your car in Society X you run out of gas. You have to park your car on the side of the highway to start walking to the nearest gas station. You are unsure about where the nearest gas station is located. You are just about to start walking when a police car stops, picks you up, and drives you to the nearest gas station and then drives you back to your car again.” For the group vertical decrease, the same scenarios were used but the authorities were described as unhelpful and unkind. For instance, the corresponding scenario for this group read: “While driving your car in Society X you run out of gas. You have to park your car on

the side of the highway to start walking to the nearest gas station. You are unsure about where the nearest gas station is located. You are just about to start walking when you see a police car passing you in slow speed. You wave to them to stop to ask them for direction and help, but they only stare at you and pass by.”

The same response scales were used to measure changes in vertical and horizontal trust as in Experiment 2. Completing the questionnaire required about 30 minutes. Subsequently, participants handed in their questionnaire and were individually paid and debriefed outside the class room.

Results and Discussion

Means of participants’ ratings of to what extent their vertical and horizontal trust were modified by the separate scenarios are displayed in Table 3 in relation to the experimental manipulation inducing different changes in trust. Means for vertical trust correspond to the mean of changed trust in three different authorities, the police, judges, and the government. As the scale ranged from -4 to 4, negative figures indicate that trust was decreased, and positive figures indicate that trust was increased.

Insert Table 3 about here

A 4 (experimental group: horizontal decrease vs. horizontal increase vs. vertical decrease vs. vertical increase) by 2 (trust: horizontal vs. vertical) by 5 (scenario: scenario 1 vs. scenario 2 vs. scenario 3 vs. scenario 4 vs. scenario 5) ANOVA with repeated measures on the last two factors was performed on the mean ratings. The main effect of experimental group, $F(3, 44) = 85.07, p < .001, \eta_p^2 = .85$, and follow-up Bonferroni corrected t -tests at $p = .05$, indicated that trust decreased to a higher extent

for the group vertical decrease ($M = -2.09$, $SD = .72$) than for the group horizontal decrease ($M = -1.30$, $SD = .67$), and that trust decreased even less for the two groups horizontal increase ($M = 1.12$, $SD = .56$) and vertical increase ($M = .96$, $SD = .42$). As expected from the hypothesis of the causal mechanism between vertical and horizontal trust, this main effect was qualified by a significant interaction effect between experimental group and trust, $F(3, 44) = 23.44$, $p < .001$, $\eta_p^2 = .62$. For horizontal trust, we hypothesized *Horizontal increase = Vertical increase > Horizontal decrease = Vertical decrease*. Thus, we expected that the level of horizontal trust should not differ between the groups horizontal increase ($M = 1.97$, $SD = 1.28$) and vertical increase ($M = .55$, $SD = .42$). However, as in Experiment 2, the hypothesis was not supported given that Bonferroni corrected t -tests at $p = .05$ showed that the two means differed. We expected a higher horizontal trust for the group vertical increase than for the group horizontal decrease ($M = -2.38$, $SD = .92$) which was verified in the follow-up t -tests. Finally, we expected no difference in horizontal trust between the groups horizontal decrease and vertical decrease ($M = -1.92$, $SD = .99$). Unlike the results for Experiment 2, the follow-up t -tests now verified the hypothesis.

For vertical trust, we hypothesized *Vertical increase > Horizontal increase = Horizontal decrease > Vertical decrease*. Thus, a higher vertical trust level was expected in the group vertical increase ($M = 1.36$, $SD = .71$) than in the group horizontal increase ($M = .28$, $SD = .50$). In line with the hypothesis, Bonferroni corrected t -tests at $p = .05$ showed that the difference was significant. We expected the same levels of trust in the groups horizontal increase and horizontal decrease ($M = -.21$, $SD = .77$), which was verified in the follow-up t -tests. Finally, we expected vertical trust to be higher in

horizontal decrease than in vertical decrease ($M = -2.26$, $SD = .82$), which also was supported in the follow-up t -tests.

A corresponding 4 (experimental group: horizontal decrease vs. horizontal increase vs. vertical decrease vs. vertical increase) by 2 (trust: horizontal vs. vertical) ANOVA with repeated measures on the last factor was performed on participants' ratings of changes in the two forms of trust when all five scenarios were presented simultaneously. Means are provided in Table 3. The analysis yielded a significant main effect of experimental group, $F(3, 44) = 86.24$, $p < .001$, $\eta_p^2 = .86$. Bonferroni corrected t -tests at $p = .05$ showed that the levels of trust decreased more in the group vertical decrease ($M = -2.60$, $SD = .75$) than for the group horizontal decrease ($M = -1.42$, $SD = .66$), and that trust decreased even less for the two groups horizontal increase ($M = 1.06$, $SD = .74$) and vertical increase ($M = 1.22$, $SD = .65$). As hypothesized, the two-way interaction effect between experimental group and trust was significant, $F(3, 44) = 18.43$, $p < .001$, $\eta_p^2 = .56$. Bonferroni corrected t -tests were performed in order to test the hypothesis. In line with the hypothesis, levels of horizontal trust did not differ between the two groups horizontal increase ($M = 1.92$, $SD = 1.38$) and vertical increase ($M = .75$, $SD = .87$). Also in line with the hypothesis, horizontal trust was higher in vertical increase than in the groups horizontal decrease ($M = -2.50$, $SD = 1.38$) and vertical decrease ($M = -2.58$, $SD = .79$). In line with what was expected, means for the latter two groups did not differ. The corresponding t -tests for vertical trust indicated in line with what was expected that vertical trust was higher in the group vertical increase ($M = 1.69$, $SD = .89$) than in the groups horizontal increase ($M = .19$, $SD = .58$) and horizontal decrease ($M = -.33$, $SD = .51$). In line with the hypothesis, means for the

latter two groups did not differ, and they were higher than in the group vertical decrease ($M = -2.61, SD = .93$).

In sum, the results verified our hypothesis. Unlike the results of Experiment 2, horizontal trust was not decreased in the group vertical increase. Instead, horizontal trust increased for this group. This supports the interpretation of the results of Experiment 2, that participants in the group vertical increase based their horizontal trust on “other people” doing bad things as described in the scenarios.

The hypothesis about the causal mechanism from vertical to horizontal trust was thus verified by the results on Experiment 3, given that the scenarios used in the groups vertical increase and vertical decrease were very similar, that is, they differed only in terms of outcomes, and no “other people” were described to base the level of horizontal trust. Therefore, it can also be concluded that the decreased levels of horizontal trust in the group vertical decrease in Experiment 2, which was in line with what was expected from the hypothesis, could not be due to a similar explanation as the explanation given to the lack of expected results for the group vertical increase.

Still, it may be the case that the alternative explanation to the results of Experiment 2, that the causal mechanism works better when trust is decreased as compared to when it is increased, is valid. To control for this and to test the hypothesis within the experimental groups, separate Bonferroni corrected paired sample *t*-tests at $p = .05$ were performed on the mean of participants’ ratings of vertical and horizontal trust change for each of the scenarios.³ Again, given that the hypothesis states that vertical trust affects horizontal trust, changes in vertical trust should differ from changes in horizontal trust when horizontal trust is manipulated, but not when vertical trust is manipulated. Significant differences between changes in horizontal trust and changes in

vertical trust were as expected found for the groups horizontal increase ($M = 1.97$ for horizontal trust vs. $M = .28$ for vertical trust) and horizontal decrease ($M = -2.38$ for horizontal trust vs. $M = -.21$ for vertical trust). In line with the hypothesis, the means for the group vertical decrease ($M = -1.92$ for horizontal trust vs. $M = -2.26$ for vertical trust) did not differ. Thus, when vertical trust through the manipulation was decreased, horizontal trust also decreased to the same extent. As in Experiment 2, however, and against what was expected, the means differed for the group vertical increase ($M = .55$ for horizontal trust vs. $M = 1.36$ for vertical trust).

Taken together, the results of Experiment 3 suggest in line with what was expected that there is a causal mechanism between vertical trust and horizontal trust. Here, as opposed to Experiment 2, the results verified the hypothesis between the experimental groups. Still, since changes in vertical trust were different from changes in horizontal trust for the group vertical increase, the hypothetical changes in vertical and horizontal trust within the experimental groups were not entirely confirmed. This suggests that both explanations to the disconfirming results of Experiment 2 for this group were valid. Participants in the group vertical increase in Experiment 2 most certainly based their horizontal trust on the “other people” described in the scenarios. However, when no descriptions of other people were present, horizontal trust was not increased as much by increased vertical trust as it was decreased by decreased vertical trust. Thus, the causal mechanism between vertical and horizontal trust depends on whether trust is decreased or increased.

General Discussion

The present research aimed at exploring a causal relationship between people’s vertical trust and horizontal trust. Given that previous research indicates that there is a

positive correlation between the two forms of trust, experimental research is necessary to explore causality. Still, to the authors' best knowledge, this is the first attempt to provide such experimental data. One reason to the lack of similar previous research may be that (horizontal) trust in general and vertical trust in particular, for reasons of validity, are difficult to study within the laboratory. Thus, since vertical trust refers to people's trust in authorities, it is a very difficult concept to manipulate. In the experiments presented herein this difficulty was solved by using experimental scenario studies where, in contrast to participants' actual behavior being under study, participants are asked to imagine that certain occurrences take place, and state how they think they would react given the occurrences.

Based on previous research by Eek and Rothstein (2004), scenarios were developed in Experiment 1 that successfully induced positive and negative effects, respectively, on horizontal trust and on vertical trust, respectively. If the hypothesis is true, that there is a causal mechanism between the two forms of trust, it should be noted that this of course implies that it is impossible to develop scenarios that only affect one form of trust. Therefore, the aim of Experiment 1 was to develop scenarios that had stronger effects on one form of trust than on the other. Several such scenarios were found and these were used to induce changes in trust to test the hypothesized causal mechanism between vertical and horizontal trust in Experiment 2.

The hypothesis received very low support in Experiment 2, especially between the experimental groups. However, within the experimental groups results fit the hypothesis better. Thus, for the two groups where horizontal trust was manipulated, changes in horizontal trust were reliably stronger than changes in vertical trust. The hypothesis suggests that when vertical trust is manipulated, both vertical and horizontal trust should

change. This was true for the group where vertical trust was decreased, but not when vertical trust was increased. Here, methodological reasons were assumed to be of importance. Thus, it was argued that horizontal trust was decreased as an effect of the manipulation for this group. This was followed up in Experiment 3, where new scenarios were developed for the two groups where vertical trust was manipulated. These scenarios were purer in the sense that they did not include descriptions of other (horizontal) people, but only of authorities. As expected, the results within groups were in perfect agreement with the hypothesis for all groups.

With only one exception, the hypothesized pattern of results between groups was also verified in Experiment 3. The exception was that horizontal trust was not increased as much by increased vertical trust as the difference between the groups horizontal increase and vertical increase became non-significant. This suggests that the hypothesis about the causal mechanism between vertical and horizontal trust works better when trust is decreased compared to when trust is increased. One explanation might be found in the literature about human preferences in decision making. Based on Prospect Theory (Kahneman & Tversky, 1974) it can be explained why losses loom larger than gains. Thus, people regret a loss more than they enjoy a gain (Tversky & Kahneman, 1991; see also Romanus, Hassing, & Gärling, (1996) about the loss-sensitivity principle). The larger effects of losses than of gains on people's behavior can possibly moderate the causal mechanism between vertical and horizontal trust and help to explain the results of the present research. Thus, when you lose trust in an authority, you lose trust in other people to a larger extent than you gain trust in other people through an increased trust in an authority. A practical implication, if this explanation is valid, is that it becomes even more important to put efforts in preserving high levels of vertical and horizontal trust

within a society. Because once citizens in a society lose their trust in untrustworthy authorities, social capital will shortly run dry, and the process of building it up again with increased vertical trust through, for instance a replacement of the authorities, is more difficult. Still, the present results suggest that in societies where citizens already have low degrees of vertical and horizontal trust, to gain trust again, efforts should put at increasing trust in the authorities. Social capital will then eventually follow.

References

- Delhey, J., & Newton, K. (2003). Who trusts? The origins of social trust in seven societies. *European Societies*, 5, 93-137.
- Eek, D., & Rothstein, B. (2004). *People's willingness to trust authorities and others: Effects of bribe, initiative to bribe, and outcome*. Unpublished manuscript.
- Gambetta, D. (Ed.). (1988). *Trust: Making and breaking cooperative relations*. Oxford: Blackwell.
- Helliwell, J. F. (2002). *How's life? Combining individual and national variables to explain subjective well-being* (Working Paper 9065). Cambridge, Mass.: NBER (National Bureau for Economic Research).
- Holmberg, S., & Weibull, L. (Eds.). (2004). *Ju mer vi är tillsammans. SOM-institutets rapport 2004*. Göteborg: Göteborg University. The SOM-Institute.
- Hooghe, M., & Stolle, D. (Eds.). (2003). *Generating social capital: Civil society and institutions in a comparative perspective*. New York: Palgrave/Macmillan.
- Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, 47, 263-291.
- Knack, S., & Keefer, P. (1997). Does social capital have an economic payoff? A cross-country investigation. *The Quarterly Journal of Economics*, 112, 1251-1288.
- Kumlin, S., & Rothstein, B. (2005). Making and breaking social capital: The impact of welfare state institutions. *Comparative Political Studies*. (Forthcoming).
- Luhmann, N. (1979). *Trust and power*. New York: John Wiley & Sons.
- Pharr, S. J., & Putnam, R. D. (Eds.). (2000). *Disaffected democracies? What's troubling the trilateral countries*. Princeton: Princeton University Press.
- Prakash, S., & Selle, P. (Eds.). (2004). *Investigating social capital*. London: SAGE.

- Putnam, R. D. (1993). *Making democracy work: Civic traditions in modern Italy*. Princeton: Princeton University Press.
- Putnam, R. D. (Ed.). (2002). *Democracy in flux: Social capital in contemporary societies*. New York: Oxford University Press.
- Romanus, J., Hassing, L., & Gärling, T. (1996). A loss-sensitivity explanation of integration of prior outcomes in risky decisions. *Acta Psychologica, 93*, 173-183.
- Rothstein, B. (2002). Sweden: Social capital in the social democratic state. In R. D. Putnam (Ed.), *Democracies in flux: The evolution of social capital in contemporary society* (pp. 289-333). Oxford: Oxford University Press.
- Rothstein, B., & Stolle, D. (2003). Social capital, impartiality, and the welfare state: An institutional approach. In M. Hooghe, & S. Dietlind (Eds.), *Generating social capital: The role of voluntary associations, institutions and government policy* (pp. 191-210). New York: Palgrave.
- Rotter, J. B. (1971). Generalized expectancies for interpersonal trust. *American Psychologist, 26*, 443-452.
- Tversky, A., & Kahneman, D. (1991). Loss aversion in riskless choice: A reference-dependent model. *The Quarterly Journal of Economics, 106*, 1039-1061.
- Tyler, T. R., & Lind, E. A. (1992). A relational model of authority in groups. In M. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 25, pp. 115-191). San Diego, CA: Academic Press.
- Uslaner, E. M. (2002). *The moral foundation of trust*. New York: Cambridge University Press.

- Uslaner, E. M. (2004). Trust and corruption. In J. G. Lambsdorf, M. Taube, & M. Schramm (Eds.), *Corruption in the new institutional economics*. London: Routledge. (Forthcoming).
- Van den Bos, K., Lind, E. A., Vermunt, R., & Wilke, H. A. M. (1997). How do I judge my outcome when I do not know the outcome of others? The psychology of the fair process effect. *Journal of Personality and Social Psychology*, 72, 1034-1046.
- Van den Bos, K., Vermunt, R., & Wilke, H. A. M. (1997). Procedural and distributive justice: What is fair depends more on what comes first than on what comes next. *Journal of Personality and Social Psychology*, 72, 95-104.
- Van den Bos, K., Wilke, H. A. M., & Lind, E. A. (1998). When do we need procedural fairness? The role of trust in authority. *Journal of Personality and Social Psychology*, 75, 1449-1458.
- Woolcock, M. (1998). Social capital and economic development. *Theory and Society*, 27, 151-208.
- Yamagishi, T. (1986). The provision of a sanctioning system as a public good. *Journal of Personality and Social Psychology*, 51, 110-116.
- Yamagishi, T., & Yamagishi, M. (1994). Trust and commitment in the United States and Japan. *Motivation and Emotion*, 18, 129-166.

Author note

This research was financially supported by grant 421-2001-4691 to Bo Rothstein from the Swedish Research Council. We thank Lina Bengtsson and Lina Leander for assistance in collecting the data for Experiments 1 and 2.

Correspondence concerning this article should be addressed to Daniel Eek, Department of Psychology, Göteborg University, P.O. Box 500, SE-405 30 Göteborg, Sweden. Phone: (voice) +46 31 773 4263, (fax) +46 31 773 4628. Email: Daniel.Eek@psy.gu.se or to Bo Rothstein, Department of Political Science, Göteborg University, P.O. Box 711 , SE-405 30 Göteborg, Sweden. Phone: (voice) +46 31 773 12 24, (fax) +46 31 773 4599. Email: Bo.Rothstein@pol.gu.se

Footnotes

¹ All scenarios for Experiments 1, 2, and 3 are provided by the authors upon request.

² Corresponding *t*-tests on participants' ratings when all scenarios were presented simultaneously provided similar results.

³ See footnote 2.

Table 1

Means of the Extent to Which Trust Was Modified by Specific Scenarios as Related to Trust Type, Trust Change, and Experimental Group

Trust type ^a	Trust change ^b	Scenario	Experimental group			
			Horizontal group		Vertical group	
			<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Vertical	Increased	1	.84	.76	1.45	1.23
		2	.42	.90	2.10	1.21
		3	1.26	1.37	2.45	1.36
		4	.74	1.10	1.10	1.71
		5	.68	1.06	1.40	1.27
	Decreased	1	-2.05	.97	-3.35	.67
		2	-2.42	1.57	-3.75	.44
		3	-1.74	1.41	-3.25	.91
		4	-1.42	.96	-2.70	1.13
		5	-1.68	1.29	-2.75	1.21
Horizontal	Increased	1	1.53	1.12	.25	.79
		2	1.79	1.08	.15	.37
		3	2.32	1.06	.30	.47
		4	1.32	1.11	.10	.31
		5	1.74	1.37	.30	.86
	Decreased	1	-1.26	1.41	-.70	.86
		2	-2.16	1.30	-.40	.82
		3	-1.16	1.30	-.50	.83
		4	-1.84	1.34	-.15	.74
		5	-2.10	1.52	-.90	1.33

Note. Scales range from trust -4 (decreased) to 4 (increased) through 0 (unaffected).

^a*Trust type* refers to whether horizontal or vertical trust was hypothesized to be affected.

^b*Trust change* refers to whether the scenario was hypothesized to cause an increase or a decrease in trust.

Table 2

Means of the Extent to Which Vertical and Horizontal Trust Was Modified by Specific Scenarios as Related to Experimental Group

Trust	Scenario	Experimental group							
		Horizontal		Horizontal		Vertical		Vertical	
		decrease		increase		decrease		increase	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Horizontal	1	-1.88	1.50	1.69	1.40	-.56	.63	.31	.60
	2	-2.44	1.21	1.94	1.61	-1.31	1.30	-1.38	1.20
	3	-1.44	1.46	2.50	1.26	-1.19	1.38	-.75	1.53
	4	-2.25	1.29	1.19	1.42	-1.00	1.03	.06	.68
	5	-2.31	1.20	2.25	1.39	-.88	.89	-1.06	1.48
	All ^a	-2.75	1.24	2.94	1.18	-1.69	1.49	-1.12	1.63
Vertical	1	-.42	.49	.44	.76	-1.50	.99	1.12	1.00
	2	-.44	.59	.46	.93	-1.81	1.03	.44	.75
	3	-.85	1.05	.40	.59	-1.85	1.12	1.08	.90
	4	-.21	.36	.42	.91	-1.64	1.20	.52	.71
	5	-1.12	1.10	.27	.53	-1.40	1.00	.96	.76
	All ^a	-1.29	1.20	.75	.95	-2.27	.94	1.48	.79

Note. Scales range from trust -4 (decreased) to 4 (increased) through 0 (unaffected).

^aAll refers to the ratings in relation to when all scenarios were presented simultaneously, not the means of the separate scenarios.

Table 3

Means of the Extent to Which Vertical and Horizontal Trust Was Modified by Specific Scenarios as Related to Experimental Group

Trust	Scenario	Experimental group							
		Horizontal		Horizontal		Vertical		Vertical	
		decrease		increase		decrease		increase	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Horizontal	1	-2.00	1.41	1.92	1.50	-1.50	1.17	.67	.65
	2	-2.75	.96	1.83	1.64	-2.08	1.31	.33	.49
	3	-2.00	1.48	2.42	1.38	-2.00	1.21	.67	.49
	4	-2.75	1.14	1.50	1.31	-2.08	1.00	.50	.52
	5	-2.42	1.08	2.17	1.27	-1.92	1.16	.58	.51
	All ^a	-2.50	1.38	1.92	1.38	-2.58	.79	.75	.87
Vertical	1	-.17	.39	.28	.51	-2.06	.98	1.39	.75
	2	-.25	.96	.36	.56	-2.42	.89	1.39	.71
	3	-.25	.96	.28	.51	-2.50	.95	1.36	.78
	4	-.25	.96	.19	.52	-2.22	.96	1.39	.80
	5	-.14	.88	.30	.50	-2.08	1.06	1.28	.84
	All ^a	-.33	.51	.19	.58	-2.61	.93	1.69	.89

Note. Scales range from trust -4 (decreased) to 4 (increased) through 0 (unaffected).

^aAll refers to the ratings in relation to when all scenarios were presented simultaneously, not the means of the separate scenarios.

Figure Caption

Figure 1. Means of participants' ratings of changes in trust as related to experimental group and the hypothesized effects of the different scenarios.

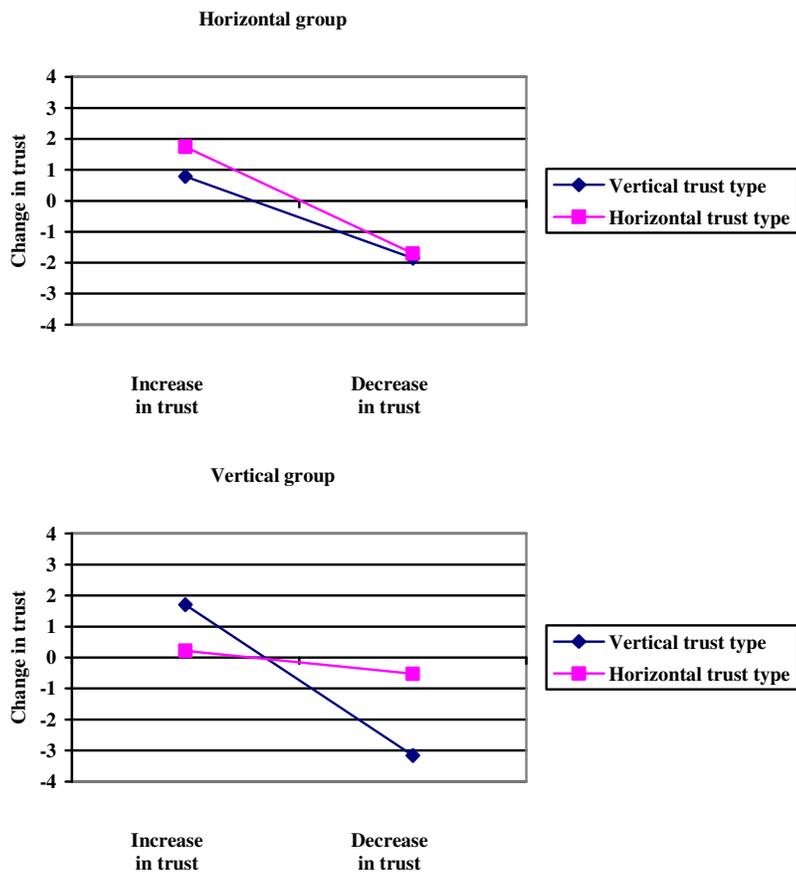


Figure 1