Verbal and behavioural indicators of trust: How well are they associated?

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Outline

- Definitions of trust
- Some research issues for psychologists
- Ways of studying trust
- Similar models of trust in a variety of areas
- O'Neill's (2002) critique
- Testing an assumption common to all models
- Four experiments on trust in risk communicators
- Implications for models of trust, research, & policy

Defining trust

- Studied across the social sciences (Fukuyama, 1995: Kramer & Tyler, 1996; Markova; 2004).
- Variously defined:
  - reliance on another party under a condition of risk (Currall & Epstein, 2003)
  - willingness to make oneself vulnerable to the vicissitudes of others (Mayer et al, 1995)
  - a psychological state comprising the intention to accept vulnerability based on positive expectations of the intentions or behavior of another (Rousseau et al, 1998)

Trust: Some research issues

- Trust appears to be lost faster than it is gained. Why? What can be done to rebuild trust?
- Is there transfer of loss of trust in a source across domains? (cf BSE -> MMR in the UK)
- Are some people/cultures more trusting than others and, if so, why? (Trust-based/law-based societies)
- What characteristics of a person or organization tend to induce trust in people? Is the resulting trust well-placed? (cf judging trust from faces; similarity)
- Physiological mediators (eg oxytocin).

Two ways of studying trust

- Sociologists and political scientists carry out polls and surveys. They ask people how much they trust different types of agent (doctors, government scientists, politicians, family members, etc.).
- Economists and psychologists carry out behavioural experiments that reveal the extent to which people trust and are trustworthy. For example, the trust game is used in this way.

An example of the verbal approach: Surveys measure *stated* trust

- Frewer et al (1996) asked UK people to rate their trust in 15 sources of information about food risks.
- Respondents estimated their trust to be greatest in university and government scientists and least in Members of Parliament and tabloid newspapers.
- Hunt et al (1999) obtained the same results for trust in information about risks from radiation hazards. They also found their UK respondents had greater trust in government ministries than in consumer organizations. (Surprising given the BSE fiasco.)

Stated trust varies across countries

- Frewer et al (2003) studied people's stated trust in information sources that communicated risks associated with genetically modified foods.
- For each source, respondents rated their agreement with four statements that factor analysis had shown to correlate with trust.
- Consumer organizations were most trusted in Denmark, Germany and Italy, followed by Government and then Industry sources. But they confirmed that, in the UK, Government sources are trusted more than Consumer organizations.

An example of the behavioural approach: The trust game measures *revealed* trust

- The investor is given some money, say $2000. He or she decides how much to invest with the investee. The amount invested is tripled. The investee decides how much to return to the investor.
- According to classical economics, the investor should expect the investee to return nothing and therefore should invest nothing in the first place.
- But typically, people invest at least half of what they have. They trust the investee. Why? For Barber (1983), we have expectations of societal decency.

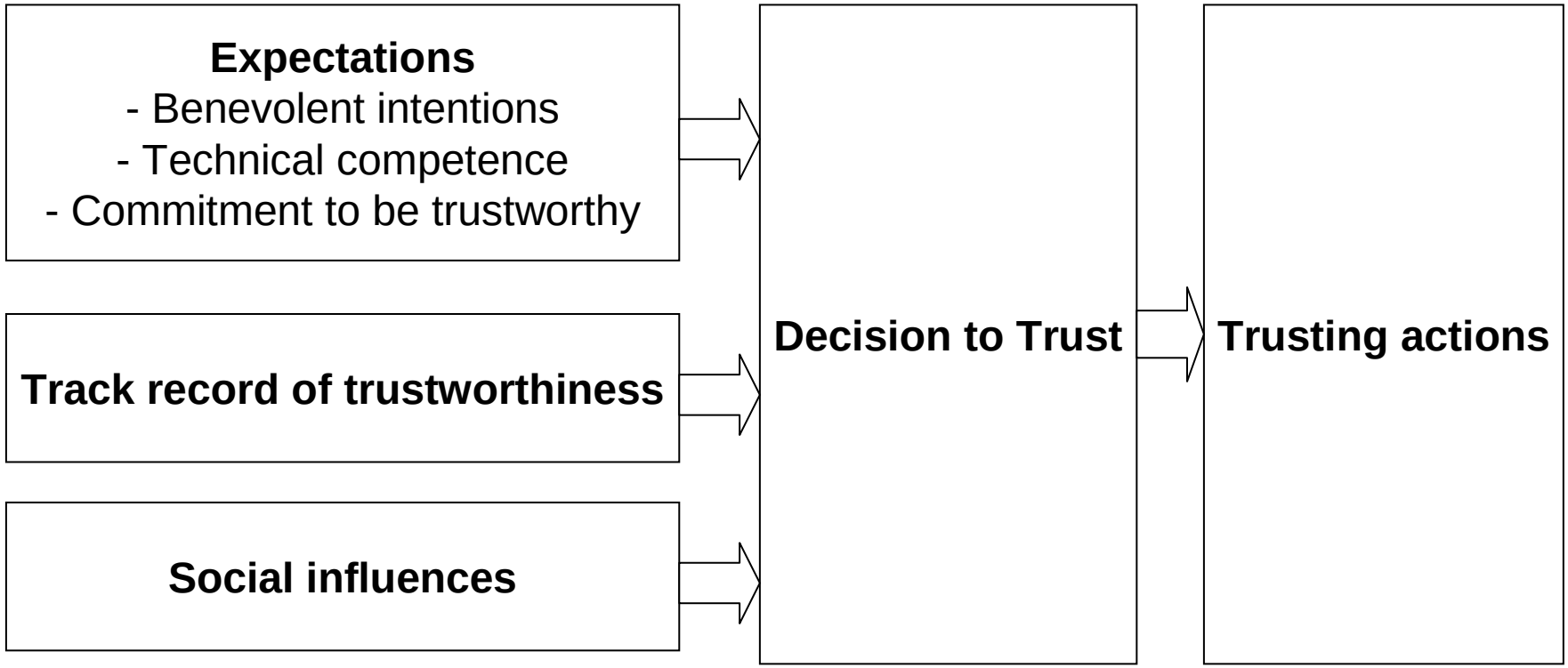
Revealed trust varies across countries

- In the trust game, trust (amount invested) and trustworthiness (amount returned) vary across cultures. Buchan et al (2000) compared China, Japan, Korea and the US. Trust was greater in the US and China (.76) than in Japan and Korea (.51). Trustworthiness was greater in China and Korea (.41) than in the US and Japan (.28). Ensminger (2000) found both are very low in Kenyan herders.
- Degree of cooperative activity and ‘market integration’ may help to determine trust

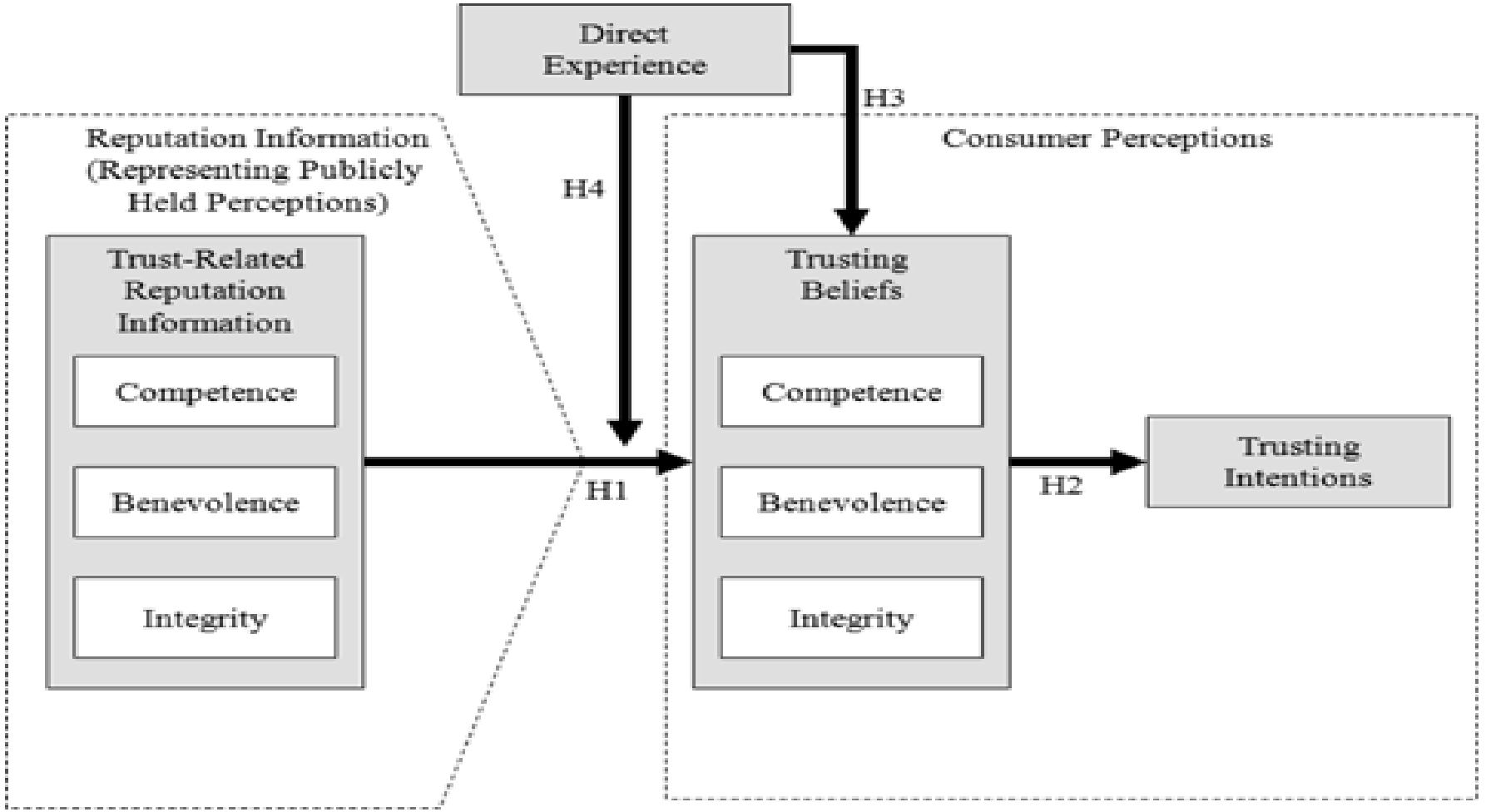
Models of trust in people and organizations

- Similar models of trust have been independently proposed in various different domains:
  - Organizational trust: would you invest with this bank?
  - E-commerce: can I trust the people running this website with my credit card details?
  - Workplace trust: can I trust my manager, colleague, employee to do what they say they will do?
  - **Risk communication** (and recommender systems): can I trust this advisor to provide accurate information?
- Analogous models for trust in systems (Moray et al)

Currall and Epstein's (2003) model of organizational trust.



Fuller et al's (2007) model of trust in e-vendors.

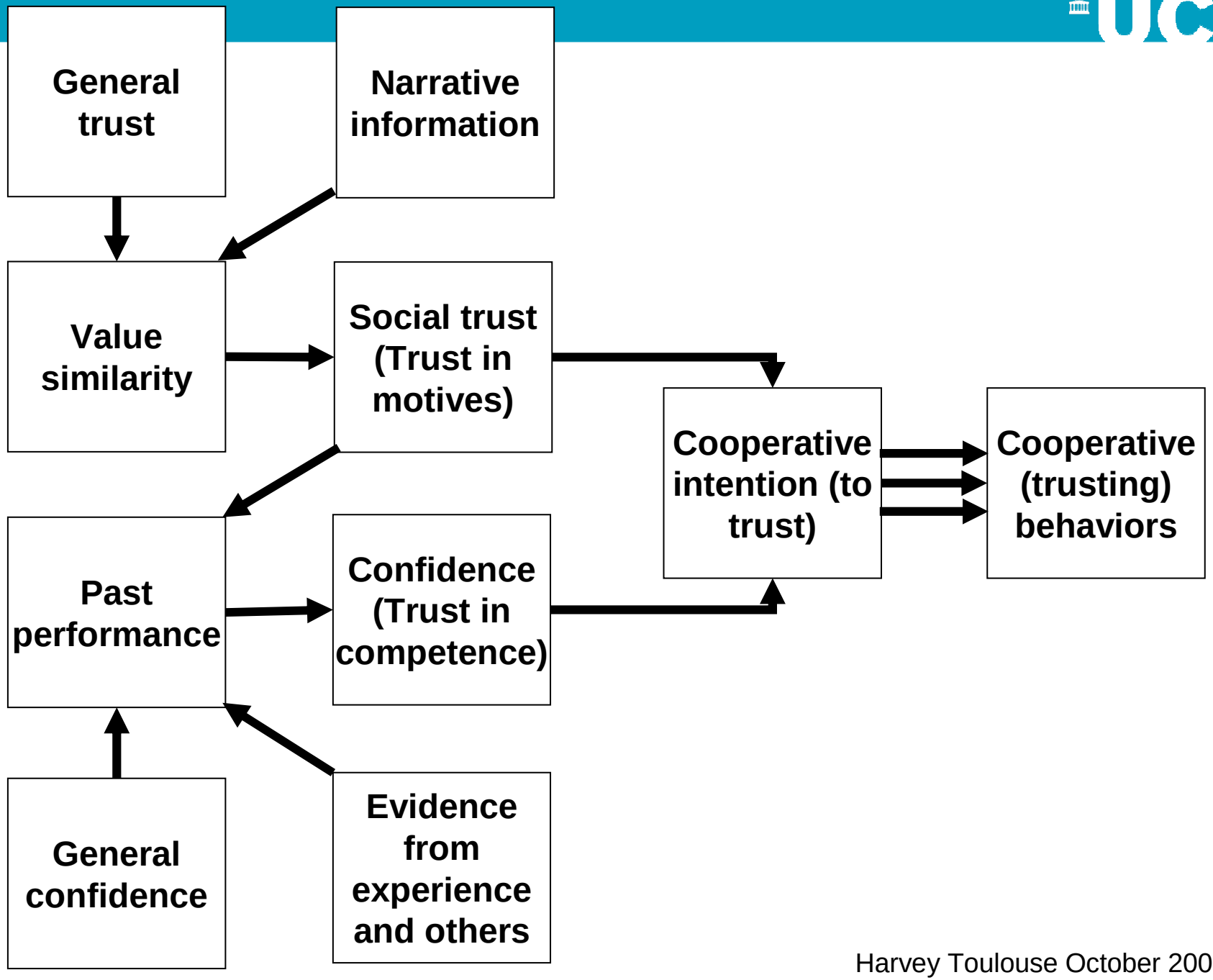


Rousseau et al's (1998) model of trust in the workplace

- Rousseau, Sitkin, Burt and Camerer (1998) distinguish a) rational calculus-based trust based on evidence of competence and b) relational trust based on repeated interactions between people that evince care or concern.
- For example, an individual's relational trust in her superior is likely to increase if the latter is willing to infringe institutional rules to benefit her.
- Over time the importance of relational trust increases relative to that of calculative trust.

Siegrist et al's (2003, 2005) two-route model of trust in sources of advice.

- We distrust a source because it cannot provide good information (even though it might want to do so) and/or because it does not want to provide that information (even though it might be able to).
- Siegrist, Earle & Gutscher's (2003) TCC (Trust – Confidence – Cooperation) model is well-specified. It distinguishes trust in competence (confidence) from trust in motives (trust or social trust). Both determine cooperative (trusting) behaviour.


General trust
Narrative information
Value similarity
Social trust (Trust in motives)
Cooperative intention (to trust)
Cooperative (trusting) behaviors
Past performance
Confidence (Trust in competence)
General confidence
Evidence from experience and others

Common features of models of trust in different domains

- We can see that all models are multi-route models. Specifically, they all have multiple inputs.
- Typically one input corresponds to the trustee's competence and another to the benevolence of their motives. But there may be additional inputs.
- However, all models have a final common pathway (FCP). There is only one processor that determines all expressions of trust.

Data used to support these models are verbal rather than behavioural (as in the trust game)

- Most of the data used to support these models have been obtained from questionnaires, polls and surveys. People have been asked whether they would trust a particular agent or system under particular conditions. They are verbal data.
- Factor analysis and structural equation modelling have been used to examine whether answers to different types of questions relate to one another in the way that the models predict that they should.

Questionnaire data: Determinants of trust in sources of advice about risk

- Factor analytic studies have produced varied results (eg Mayer et al, 1995; Renn & Levine, 1991). But, in line with Siegrist et al (2003), there is some consensus that two broad categories of factors are important in determining trust:
  - those related to the competence of the source – knowledge, ability, expertise
  - those related to the motives of the source – honesty, benevolence, fairness, integrity

Structural equation modelling of questionnaire data: Evidence for the TCC model

- Siegrist et al (2003) broadly confirmed the model.
- But the link between past performance and confidence was weak and social trust directly affected confidence. They argue trust was used as a proxy for past performance with the unfamiliar risk they studied (electromagnetic radiation).
- Earle & Siegrist (2006) found a stronger link between past history and confidence with a familiar risk (freeway expansion) but a weak link between confidence and cooperation with an unfamiliar one (oil exploration).

Questionnaire studies: Validity depends on the final common pathway assumption

- O'Neill (2002) argued: "The evidence suggests that we still constantly place trust in many of the institutions and professions that we profess not to trust." Thus different forms of trust may dissociate.
- Expressed distrust may be intended as signal to institutions and professions. Alternatively, people may have little insight into their behavioural placement of trust.
- It would be useful to have behavioural evidence from experiments to support the TCC model.

Does behavioural data validate questionnaire studies? The case of value similarity and trust

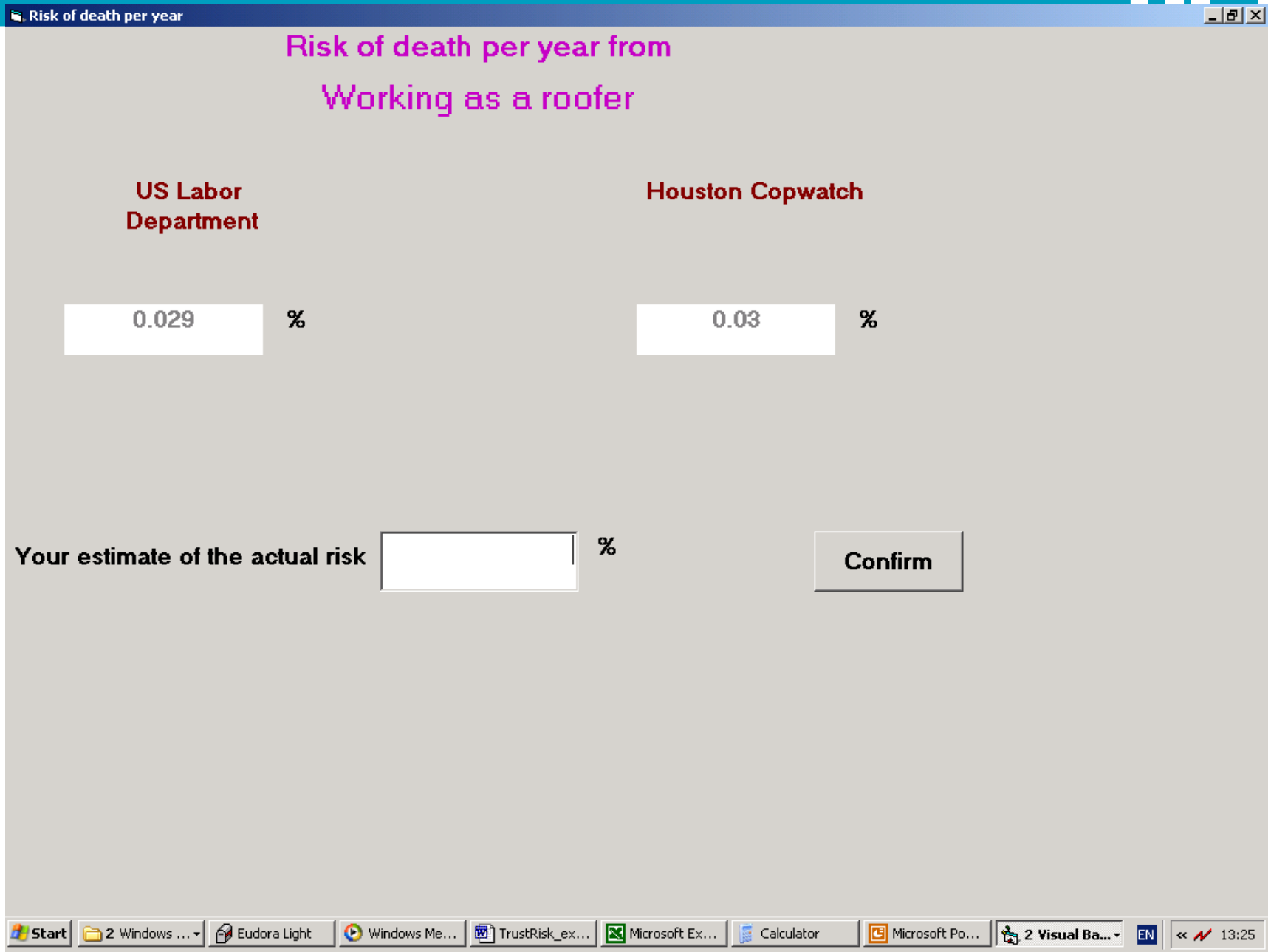
- Twyman, Harvey and Harries (2008) showed behavioural trust (degree to which judgment was influenced by an advisor) was greater when judges shared values with their advisors. Demographic similarity acted as a proxy for value similarity.
- This is consistent with that part of Siegrist et al's (2003, 2005) model concerned with trust in motives.

Does behavioural data validate questionnaire studies? Testing the FCP assumption

- Risk estimates were obtained from two real sources. For each risk type, one was a consumer organization and one was a government agency . The mean of these was taken as the ‘actual risk’.
- To produce advice, values were drawn at random from a normal distribution centred on the ‘actual risk’. Changing the standard deviation (SD) as a % of that value altered the accuracy of the advice.
- This SD was the same (20%) for both types of advisor in **Experiment 1**. As a result, both were, on average, fairly poor.

Experiment 1: Stated and revealed trust in two different but equally good sources

- 47 participants received risk information about various hazards (occupational, transport, recreational, drugs) from two different sources (government agency, consumer organization).
- *Stage 1: Using advice to form judgments.* Advice from the sources was used to form estimates of risk associated with 32 randomly ordered hazards. Feedback of actual risks was given for the first 16.
- *Stage 2: Stating trust in advisors.* Also estimate advisors' accuracy, bias, and similarity of values.


Risk of death per year
Risk of death per year from
Working as a roofer
US Labor Department
Houston Copwatch
0.029
%
0.03
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Your estimate of the actual risk
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Confirm
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2 Windows ...
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Windows Me...
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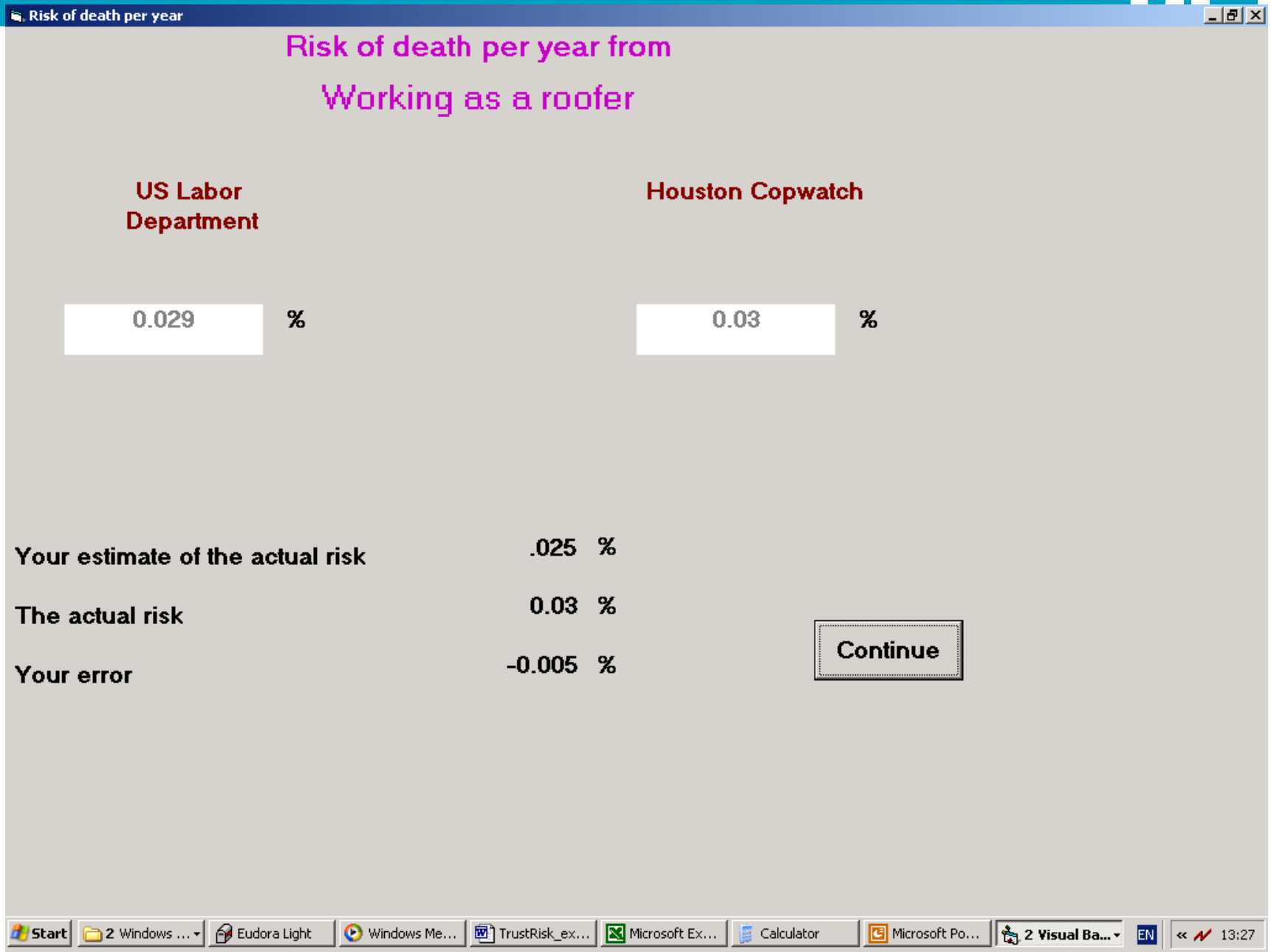
Risk of death per year
Risk of death per year from
Working as a roofer
US Labor Department
Houston Copwatch
0.029
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Relative measure of stated and revealed trust

- **Relative stated trust in government:**

$$\frac{\text{Government agency's trust rating}}{\text{Sum of both trust ratings}}$$

This measure will be over .5 when people say that they have more trust in the government source.

- **Relative revealed trust in government:**

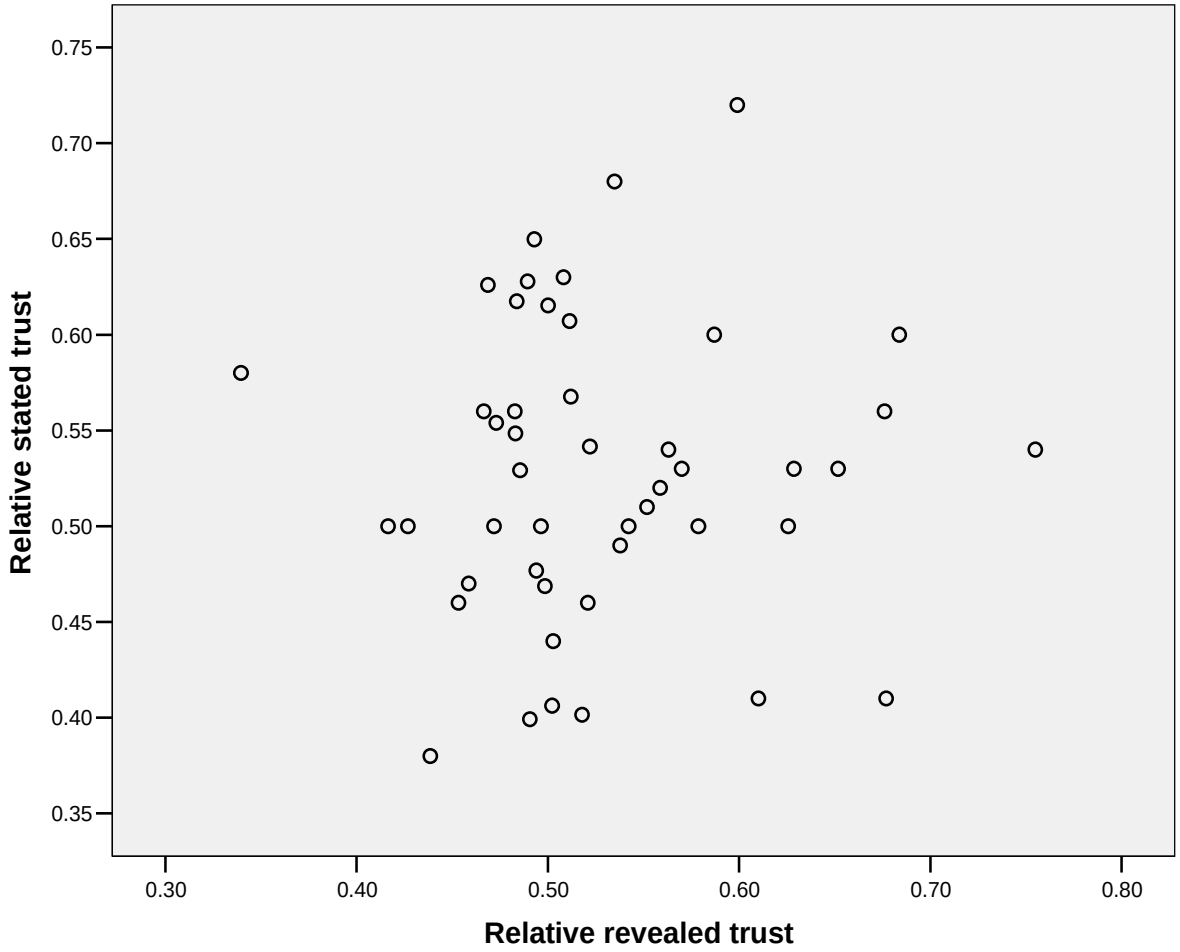
$$\frac{|\text{Judgment} - \text{Cons Org's advice}|}{|\text{Judgment} - \text{Cons Org's advice}| + |\text{Judgment} - \text{Gov Agency's advice}|}.$$

This measure behaves similarly. It is over .5 when people place more trust in the government source.

Mean of both types of relative trust was .53; Greater trust in government (cf Frewer, 1996)

R = .04

No relation



Other correlations between relative scores

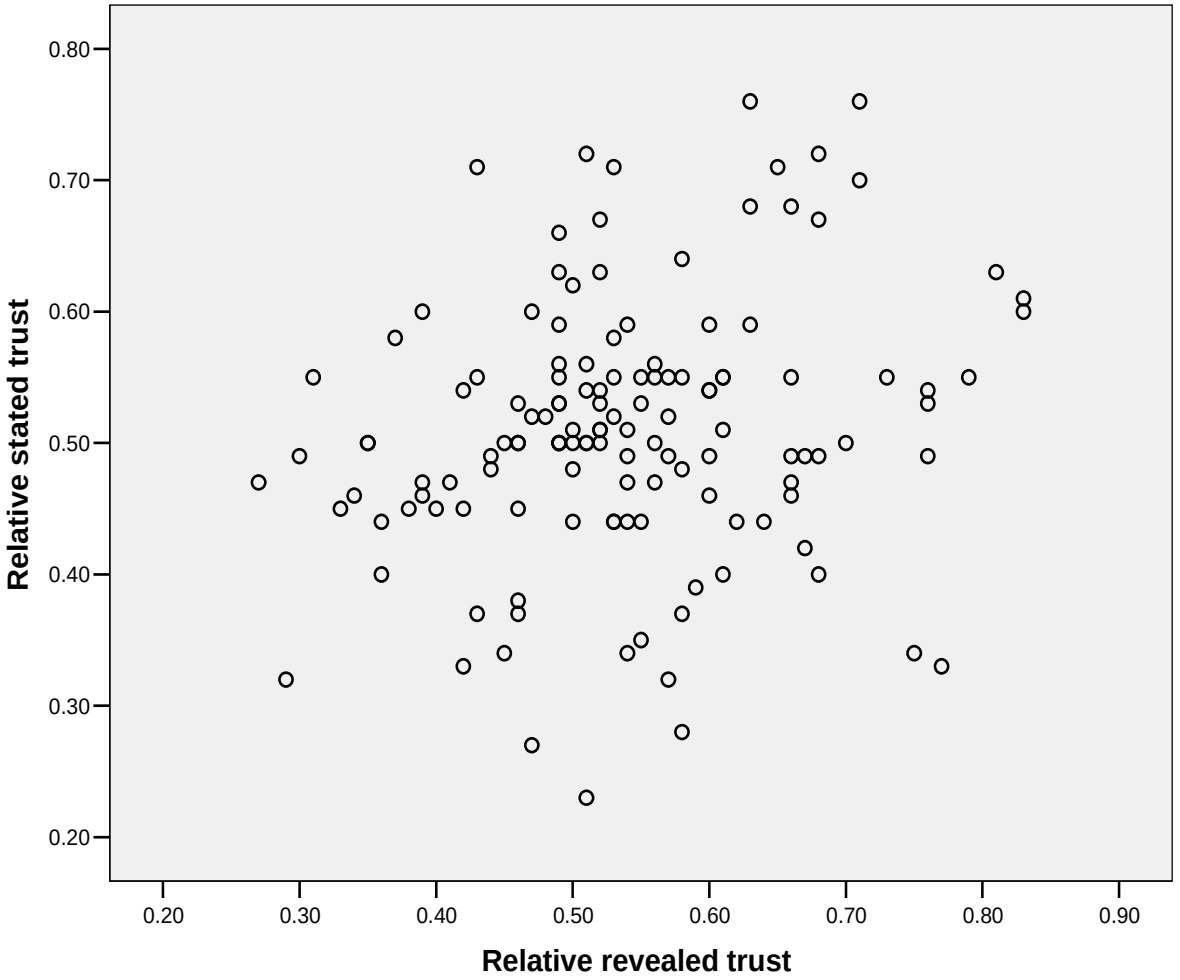
- Stated trust correlated with both judged accuracy ($r = .39$; $p < .01$) and the similarity of values index ($r = .58$; $p < .01$). Supports Siegrist et al (2005).
- Revealed trust correlated with judged accuracy ($r = .39$; $p < .01$) but not with the similarity of values index ($r = -.01$). Implies it is determined differently.
- Participants who judged the government agencies to be more biased towards overestimation also judged them more accurate ($r = .37$; $p < .05$).

Experiment 2: Advisors good but differ in accuracy. Small but significant positive relation

N = 138

R = .21

P < .05

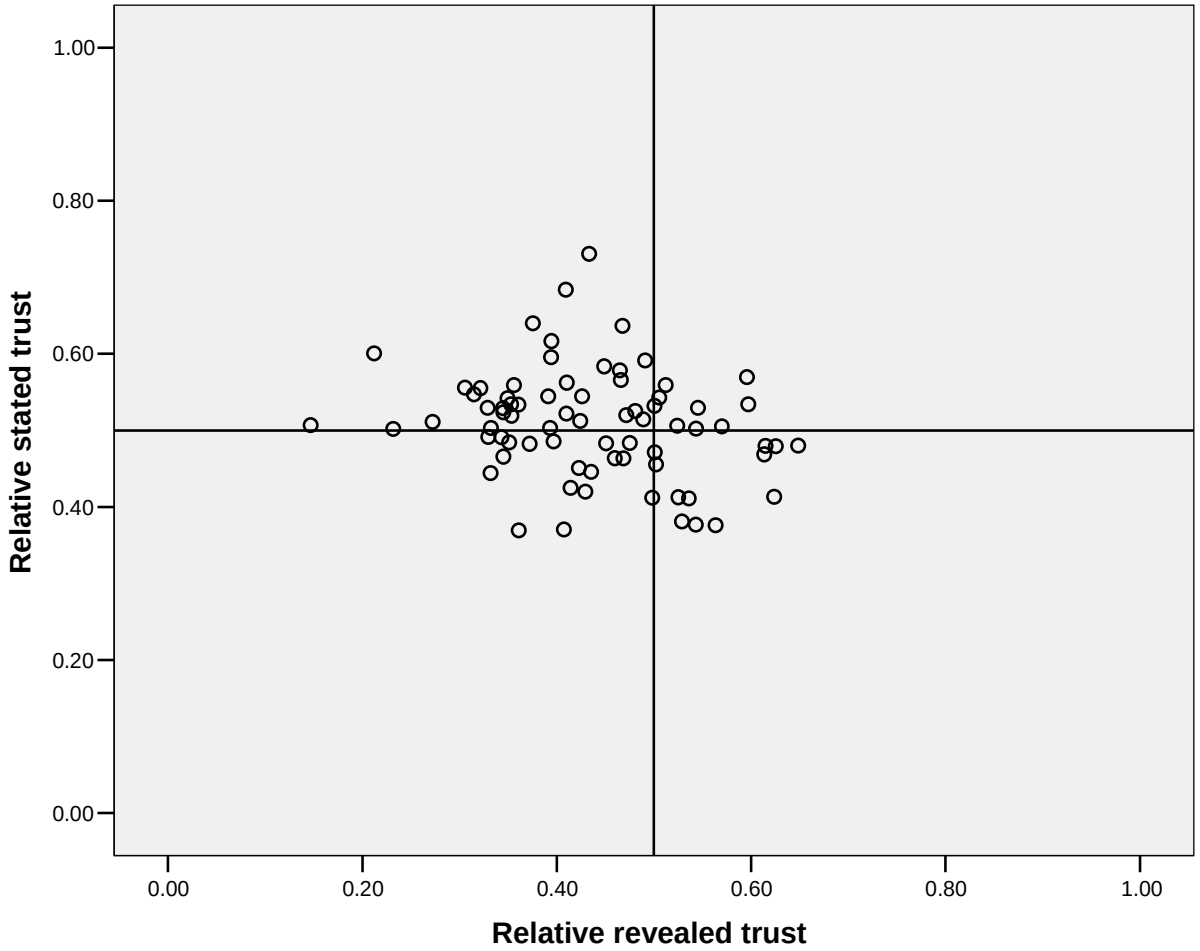


Experiment 3: Advisors poor but differ in accuracy. Small but significant negative relation

N = 74

R = -.232

P < .05

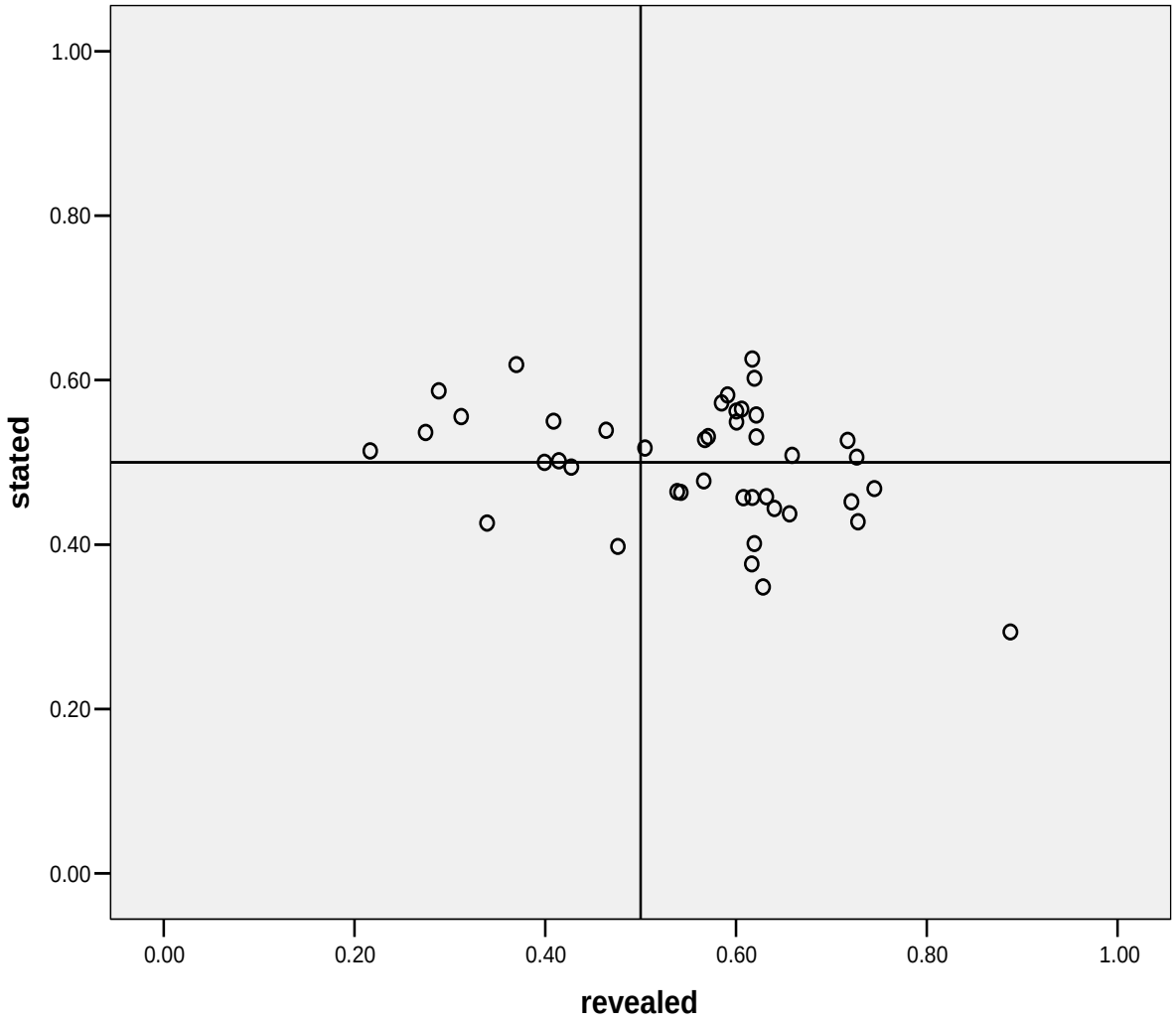


Experiment 4: Advisors biased in opposite ways (government overestimates risk)

N = 42

R = -.371

P < .05



Findings support O'Neill's (2003) critique and provide evidence against the FCP assumption.

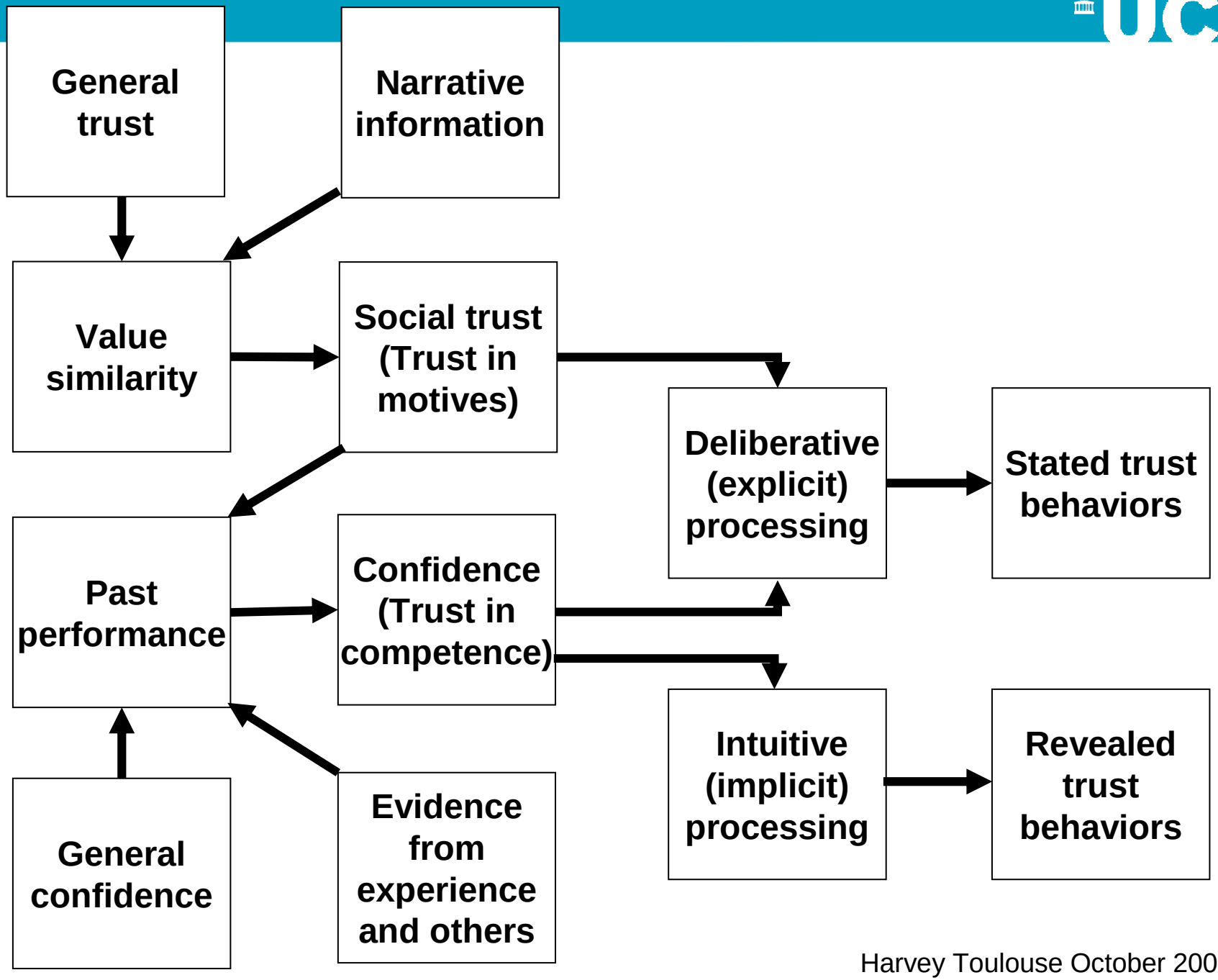
- The relation between stated and revealed trust was task-dependent: negligible in Exp 1, weakly positive in Exp 2, & weakly negative in Exps 3 & 4.
- The FCP assumption predicts that different expressions of trust will be consistent. But many people said that they trusted one type of agent more while placing more trust in the other type.
- Individual differences in trust in motives and trust in competence should affect both stated and revealed trust. But the rankings of participants in terms of stated and revealed trust were different.

Nature of the task-specific effects

- When advice was good (Exp 2), people's stated trust was higher in the better advisor but their revealed trust was more biased towards the government. Thus use of advisors was about equal even when the government was worse.
- When advice was poor (Exp 3), there was little difference in people's stated trust between advisors but they were less likely to use advice from the government, even when it was better.
- So changing advice quality (Exp 2 vs Exp 3) produces a double dissociation across trust types($F(1,188) = 21.72$) -> different processes.

Implications for models of trust

- Stated and revealed trust correlate with different factors. Stated trust correlates with both judged accuracy and similarity of values as Siegrist et al's (2003, 2005) model predicts. But revealed trust correlates only with judged accuracy.
- Although we support many aspects of Siegrist et al's (2005) model both here and in Twyman et al (2008), we think it needs some modification.
- One approach to this is in terms of the type of dual system processing advocated by Kahneman and others (Sloman, Epstein, Evans, Slovic, etc).



Harvey Toulouse October 2009

Government agencies vs consumer organizations

- Except when advice was very poor, people *placed* more trust in the government. This fits with what Frewer et al (1996) found for *stated* trust in the UK.
- But we found no differences for stated trust. May be differences for stated trust depend on hazard type.
- In contrast, Frewer et al (1996) found that people in most European countries stated they had more trust in consumer organizations. There also may be differences in revealed trust between countries.

Implications for research and policy

- Social researchers and the media often report polls and surveys of the extent to which people trust different types of agents and advisors (e.g., government or university scientists, consumer organizations, doctors, friends, politicians).
- Following O'Neill's speculation, our research suggests that we should be cautious about accepting these results at face value. People may not have full insight into who they trust behaviourally. Or there may be a hidden agenda behind their verbal statements.

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