Choice under Uncertainty: The Role of Trust

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ABSTRACT

Trust may be considered a risk moderator in choice under uncertainty and may help people to follow courses of action otherwise too risky to be undertaken. This hypothesis has been tested following a two-step research design. Results confirm the different role of cognitive and affective trust as risk moderators depending on the complexity of the task to perform.

LITERATURE REVIEW AND RESEARCH HYPOTHESES

Many scholars agree on the role played by a limited number of strategic relationships in order to achieve and maintain competitive advantages in domestic and international markets (Diericks, Cool, 1989; Morgan, Hunt, 1999; Dyer, Sing, 1996) and underline the critical role of trust in implementing lasting relationships among economic actors (Morgan, Hunt, 1994; Hakansson, Snehota, 1995). Indeed, these relationships require highly specific learning processes and idiosyncratic investments that will appear risky unless high commitment of participants, collaborative climate and trust reduce the chance of failure (Geyskens, Steenkamp, Kumar, 1998; Jap, 1999).

Regarding trust, a number of topics are often debated in the marketing literature: the interpersonal/ inter-organizational nature of the concept, its multidimensionality and its role as risk moderator in uncertain decision contexts. This paper aims to study the role that trust - as an interpersonal and multi-dimensional construct - may play as risk moderator when people face a choice under uncertainty.

Even though trust plays a central role in inter-organizational relationships, it is often grounded in individual perceptions and expectations (Anderson, Narus, 1990; Blois, 1999; Currall e Judge,

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1994; Ganesan, 1994; Weitz, Jap, 1995): trust arises between subjects in two organizations and may become an organizational resource (Doney, Cannon, 1997; Zaheer, McEvily, Perrone, 1998; Dyer, Chu, 2000). In accordance with this statement, this paper is focused on the role played by trust in interpersonal relationships, with the hope these results will be helpful in developing a better understanding of inter-organizational dynamics.

Several authors have argued for the critical role of trust as risk moderator in organizational decision making (Johnson-George, Swap, 1982; Sheppard, Sherman, 1998; Davis, Schoorman, Hoon Tan, 2000). Different decision contexts may produce different risk perceptions and may require different *trust endowments* (Lewicki, Bunker, 1996; Sheppard, Sherman, 1998). However, risk perception alone is not sufficient to define the specific role of trust in decision making. Indeed, one person trusts another when he chooses to work with him/her, even if he may follow alternative courses of action (Luhmann, 1988). If a decision maker chooses a specific partner to undertake an action with uncertain and potentially negative effects, when he could avoid it without negative effects, he is betting on the commitment of the partner in order to achieve a positive outcome. In this case, trust becomes the critical resource that makes possible a course of action otherwise too risky to be undertaken. The paper is aimed to study how and when trust may affect the perception of risk in a specific decision context and is mainly based on Tversky and Kahneman's Prospect Theory (Tversky, Kahneman, 1979, 1981, 1986). According to this theory, people make decisions by referring to a value function and a decision weight function which states a systematic mismatch between stated probabilities of possible outcomes of an action and the weighting people give them in decision making. *Briefly stated, this function overweighs small probabilities and underweighs larger probabilities* (Einhorn, Hogarth, 1988). Moreover, it seems that underweighting of stated probabilities increases when uncertainty about possible outcomes increases (Einhorn, Hogarth, 1988). Different elements have been advocated as moderators of stated probabilities underweighting and this paper aims to support the role of trust as one of them.

In order to verify this hypothesis, it is necessary to define the possible sub-constructs or elementary items anchored to trust. Indeed, several authors have conceptualised trust as a multi-dimensional construct and operazionalized it by reference to specific attributes regarding two main domains: the cognitive and the affective. On the one hand, researchers describe e components of trust such as credibility (Ganesan, 1994; Doney, Cannon, 1997), honesty (Morgan e Hunt, 1994; Kumar, Scheer, Steenkamp, 1995; Geyskens, Steenkamp, Scheer, Kumar, 1996), competence (Ganesan, 1994; Zaheer, McEvily, Perrone, 1998), predictability (Zaheer, McEvily, Perrone, 1997; Jap, 1999) as critical indicators of the ability of trustee to perform a task well. These components refer to the cognitive sphere of trust: one partner knows the other well enough to make grounded forecasts of his/her future behaviour. On the other hand, researchers refer to trust as to the willingness of trustees to satisfy the expectations and needs of trustors (Anderson e Weitz, 1989; Anderson e Narus, 1990) or as the intentional willing of trustees to behave so as to yield positive outcomes for the trustors (Ganesan, 1994; Kumar, Scheer, Steenkamp, 1995; Geyskens, Steekamp, Scheer, Kumar, 1996; Doney, Cannon, 1997). This second definition of trust refers to the affective sphere of an individual: 'trust also emerges through interpretation and assessment of the other party's motives' (Doney, Cannon, 1997). Even if there is broad agreement on the conceptual distinction between cognitive (or rational) and affective (or emotional) trust, several authors underline that these two dimensions are in practice too interwined to be operationally separable (Kumar, Scheer, Stenkamp, 1995; Doney, Cannon, 1997). Nevertheless, this distinction is crucial in understanding the role of the two dimensions as risk moderators in choice under uncertainty. Until now researchers who have operazionalized the distinction have not specifically worked on trust as risk moderator: Ganesan (1994) supports the idea that cognitive, but not affective, trust sustains lasting relationships; Wicks, Berman and Jones (1999) and Sheppard and Sherman (1998) underline the diverse roles that different dimensions of trust play depending on the nature of the relationship. Morgan and Hunt (1994) have worked on trust as uncertainty moderator without discriminating between trust dimensions.

In accordance with the hypothesis that trust is a multidimensional construct, this research is aimed to test and measure the role of the various dimensions of trust as risk moderators in choice under uncertainty. Indeed, when considering the main implications of Prospect Theory, the different dimensions of trust must be considered as those attributes which a decision maker refers to in order to make choices among possible task performers. The attributes that define the option of a choice set are given different weight in decision making depending on the task to be performed. On the basis of these premises, our hypothesis is that the role of different trust dimensions as risk moderator is context-dependent, so that only highly risky decision contexts let affective trust become a crucial attribute fro significantly reducing the underweighting of stated probabilities. Specifically, we assert that:

There are *simple* contexts, where people have a very low perception of risk and where the underweighting of stated probabilities is low. In these contexts, if people are asked to choose within a set of possible task performers, each with a different score for each dimension of trust, the choice is not *benevolence-driven*. In other words, benevolence is not a discriminating item and not necessarily the most benevolent partner is chosen.

There are *competence* contexts, where people have a higher perception of, and show a higher underweighting of, stated probabilities. In these contexts, if people are asked to choose within a set of possible task performers, each with a different score for each dimension of trust, the choice is *expertise/competence-driven*. In other words, the specific know-how of the partner is the discriminating item for the choice, and benevolence may only sustain the choice. Moreover, a high competence endowment of the partner is a good moderator of stated probabilities underweight.

There are *complex* contexts, where it is very difficult to evaluate all possible outcomes and the relative occurrent probabilities, where people have a very high perception of risk and show a very high stated probability underweight. In these contexts, if people are asked to choose within a set of possible task performers, each with a different score for each dimension of trust, the choice is *benevolence-driven*. In other words, benevolence is the most important discriminating item for the

choice and a benevolent partner is chosen even if he/she is less competent than other possible performers. Moreover, in this case a high benevolence endowment is a critical moderator of stated probability underweight allowing people to choose course of action otherwise too risky.

METHODOLOGY

A preliminary analysis has been carried out in order to identify and test the dominant dimensions of trust. Because the elicitation of trust dimensions is considered context dependent, in this phase people were asked to define a trustworthy person on the basis of 36 items with no reference to a specific task or subject being made.

The preliminary analysis permitted us to identify seven related sub-constructs: an individual can trust another one because of his/her, Discreteness and Confidentiality, Warmth, Reputation, Honesty, Reliability, Expertise and Competence, Benevolence. Each sub-construct may have a different weight in the evaluation of the chance of success of an action, depending on the complexity of the task to be performed. To test this hypothesis, we drew up an experimental design, which was submitted to 100 students of the Faculty of Communication Science and Business and Administration at the University of Modena and Reggio Emilia in 2002. The respondents had to identify three partners for three different tasks, to elicit the chance of success of each partner for each task and to evaluate the partners on the seven components of trust defined in the preliminary analysis[1]. The two items with higher factor loadings for each factor emerging from the preceding step were used to define the surrogate variable of the factor scores. Indeed, the complex structure of the questionnaire required to simplify the elicitation of the original items. Respondents had also to evaluate the complexity of the task on the basis of the resources needed to perform it well. Because

[1] The tasks were described as follows:
Suppose you are attending a marketing course and that the final exam will be passed only if you pass several sub-tests. Now read the follow tasks and choose a subject for each one:
1. The professor inform students of the date of the tests during the lessons and you can't attend all lessons. You have decided to ask a colleague to keep you informed about the date of the sub-tests.
2.The next test is grounded on concepts the professor explained in some lessons you couldn't attend. You have decided to ask a colleague to give you his class notes to better understand the concepts in sight of the next test.
3. Until now you well performed all the partial tests but after the last one a bad flu confined you to bed and you couldn't attend the lessons and study. Now you are better but you have only two weeks to the next and last test. You ask a colleague to study with you. Because of the short time to the next test you can't study in depth all subjects and the colleague has to select for you the ones that, in his opinion, have good chance to be object of the test.

of the target of the test, the tasks chosen are not typical of organizational decision making processes. In any case the results of this preliminary work confirm our hypothesis and may therefore represent a reasonable basis for extending them to other decisional contexts. Finally, for each task the seven trust sub-constructs were regressed against the dependent variable (chance of success) using linear regression.

RESULTS: THE PRELIMINARY ANALYSIS ON TRUST DIMENSIONS

Trust was assessed by means of 36 items, derived from a previous analysis of main trust measures from the business relationship literature. The data collected were analysed using principal component analysis (with Kaiser normalization and oblimin rotation) (table 1).

Table 1. The dimensions of trust

Factor/*Items name*	**Mean**	**SD**	**Factor loading**	**Factor/*Items name***	**Mean**	**SD**	**Factor loading**
Factor 1: Honesty				**Factor 5: Warmth**			
onest	3,97	1,14	0,783	doesn't intimidate me	2,89	1,30	0,751
sincere	3,96	1,09	0,773	warm	2,71	1,11	0,748
trustworthy	4,24	0,91	0,772	doesn't worry me	2,66	1,14	0,740
frank	3,47	1,18	0,743	Pleasant in conversation	2,70	1,14	0,721
Cronbach's Alfa			***0,819***	***Cronbach's Alfa***			***0,748***
Factor 2: Benevolence				**Factor 6: Credibility**			
cares of me	3,40	1,22	0,793	keeps promises	4,05	1,13	0,789
out of limb	3,34	1,20	0,758	fair	4,30	0,94	0,786
Makes sacrificies for me	3,38	1,23	0,729	loyal	3,97	1,06	0,722
attitude toward me	3,92	1,02	0,699	dependable	4,26	0,90	0,697
Wishes me well	3,77	1,21	0,692	consistent	3,47	1,29	0,614
Has favourable intentions towards me*	3,11	1,26	0,602	***Cronbach's Alfa***			***0,788***
Reduces uncertainty	3,68	1,03	0,521	**Factor 7: -**			
Cronbach's Alfa			***0,844***	on my side	2,67	1,23	0,716
Factor 3: Experience				favourable intentions towards me	3,11	1,26	0,668
expert	2,46	1,20	0,884	predictable	2,19	1,12	0,598
qualified	2,35	1,15	0,797	***Cronbach's Alfa***			***0,129***
experienced	2,73	1,26	0,786	**Factor 8: Discreteness**			
competent	2,86	1,28	0,766	confidential	2,49	1,19	0,681
trained	1,85	0,95	0,717	Discrete*	2,93	1,14	0,619
powerful	1,57	0,79	0,568	***Cronbach's Alfa***			***0,626***
Cronbach's Alfa			***0,857***	**Factor 9: -**			
Factor 4: Reputation				prominent	2,67	1,48	0,774
reputable	3,39	1,05	0,738	attractive	1,58	0,92	0,530
respectable	3,35	1,13	0,726	***Cronbach's Alfa***			***0,436***
liking for	3,37	1,14	0,721				
Credible*	3,80	1,07	0,554				
Cronbach's Alfa			***0,702***				

Cross-loading higher than 0,5

The nine factors explained 69% of total variance. Items with factor loading below 0,50 were deleted and these with a cross-loading higher than 0,5 excluded. Because of the high cross-loading of the item *discrete*, factor 8 will not be used in the next phase. Moreover the application of the reliability coefficient permitted acceptance of all of the first six factors with 59% of total variance explained. The analysis of the factor scores correlation matrix reveals correlations between the six constructs always lower than 0,5; these results suggest the hypothesis that factors may describe different latent constructs. According to the literature reviewed above, honesty (factor 1), expertise and competence (factor 3), reputation (factor 4), warmth (factor 5), credibility (factor 6), may be assigned to the *cognitive* dimension, while benevolence (factor 2) to the *emotional* one.

RESULTS: THE ROLE OF TRUST DIMENSIONS AS RISK MODERATORS

Regression analysis confirms the varying role played by trust in the perception of chance of success, depending on the different task complexity performers are supposed to face.

For each of the three tasks, the linear regression is estimated on the basis of this model:

P = f(B, H, E, C, W, R)

P=Chance of success, H=Honesty, E= Expertise, Competence, C= Credibility, W= Warmth, R= Reputation, B= Benevolence

The descriptive results of the experimental design confirm that subjects perceive an increasing complexity of tasks[2] (Anova, F=23,199 p=0,000) and that chances of success decrease when perceived complexity of the task increases (Anova, F= 31,744, p=0,000). For each task the selected subject always has a higher chance of success than others showing equal chances (task 1, Anova, F=5,342, p=0,005; task 2, Anova, F=6,329, p=0,002; task 3, Anova, F=13,941, p=0,00) Moreover, in the first task all subjects have a high chance of success while in the third task, the most complex, the selected task performer shows a significantly higher performance than the other two subjects. Lastly, the three subjects show different levels of benevolence endowment; specifically, subject 1

[2] Task complexity is calculated as follows:
Comj=[sum(AiCj)/sum(maxAiCj)] with Cj=1,2,3 the three task and Ai=1…5 the cognitive dimensions of trust respondents considered relevant for an adeguate performance on a seven point Likert scale ranging from 'I strongly disagree' to 'I strongly agree'.

and 2 were perceived as equally benevolent towards, respondents but less benevolent than subject 3 (Anova, F= 3,462, P< 0,033) (table 2).

Table 2. Descriptive results

	Task 1	Task 2	Task 3
Perceived task complexity	0,63	0,67	0,77
Perceived subjects benevolence	4,70	4,88	5,15
Chance of success - Subject 1	91,04	79,78	65,00
Chance of success - Subject 2	85,90	88,13	71,06
Chance of success - Subject 3	82,61	80,57	83,20

With this premise, the independent variables describing the different dimensions of trust were regressed against the dependent variable P (chance of success) for each task.

Table 3. Results of regression analysis

	Beta	t	Sig.	Collinearity statistic: VIF
Task 1				
Credibility	0,352	6,492	0,000	1,000
Other dimensions excluded from the model	-	-	-	-
Adjusted R^2=0,121				
Task 2				
Honesty	0,233	3,732	0,000	1,332
Competence	0,180	2,888	0,000	1,332
Other dimensions excluded from the model	-	-	-	-
Adjusted R^2=0,123				
Task 3				
Benevolence	0,349	6,274	0,000	1,304
Competence	0,282	5,080	0,000	1,304
Other dimensions excluded from the model	-	-	-	-
Adjusted R^2=0,292				

In the first task the chance of success increased when the credibility dimension increased, independently of other dimensions. In the second task, the chance of success increased when the expertise and honesty dimensions increased. In the third task, the chance of success increased when the expertise and benevolence dimensions increased. So, the chance of success of subject 3 is due principally to his/her benevolence endowment and is significantly higher than the chances of success of the other subjects.

CONCLUSION AND FURTHER RESEARCH

The exploratory results seem to sustain the hypothesis that trust is a multi-dimensional construct: the difficulty of making operational distinction among sub-constructs may be due to the evoked

subjects and decision contexts. Moreover, trust may play a limited role as risk moderator in simple contexts with low underweighting of stated probabilities, whereas its role is crucial when decision contexts become more complex and risky. Finally, the evoked dimensions of trust in simple and competence contexts are mainly linked to the cognitive sub-constructs while in complex contexts they are specifically linked to the emotional one.

This exploratory design requires testing with other tasks and to be applied on inter and intra-organizational relationships. If these results are confirmed at an organizational level the theoretical implications would support the idea that highly affective relationships may help people take courses of action otherwise considered too risky to be undertaken. In other words, organizational innovation may be more probable in contexts where there is high commitment of participants and participants are highly committed with the task to perform together.

REFERENCES

Anderson J.C., Narus J.A. (1990), *A Model of Distribution Firm and Manufacturer Firm Working Partnerships*, Journal of Marketing, Vol. 54

Blois K.J. (1994), *Trust in Business to Business Relationships : An Examination of its Status*, Journal of Management Studies, Vol. 36, n. 2

Curall S.C., Judge T.A. (1994), *Measuring Trust Between Organizational Boundary Role Persons*, Organizational Behavior and Human Decision Process, Vol., 64, n.2

Davis J.H., Schoorman F.D., Mayer R.G., Hoon Tan H. (2000), *The Trusted General Manager and Business Unit Performance: Empirical Evidence of a Competitive Advantage*, Strategic Management Journal, Vol. 21

Diericks I., Cool K. (1989), *Assets Stock Accumulation and Sustainability of Competitive Advantage*, Management Science, Vol. 35

Doney P.M., Cannon J. P. (1997), *An Examination of the Nature of Trust in Buyer-Seller Relationships, Journal of Marketing*, Vol. 61

Dyer J.H., Chu W. (2000), *The Determinants of Trust in Supplier-automaker relationships in the U.S., Japan and Korea, Journal of International Business Studies*, Vol. 31, n.2

Dyer J.H., Singh H. (1996), *The Relational View,: Cooperative Strategy and Sources of Interorganizational Competitive Advantage*, Academy of Management Review, Vol. 23, n. 4

Einhorn H.J., Hogarth R.M. (1981), *Behavioral Decision Theory: Processes of Judgement and Choice*, Annual Review of Psychology, 32

Ganesan S. (1994), *Determinants of Long-Term Orientation in Buyer-Seller Relationships, Journal of Marketing*, Vol. 58

Geyskens I., Steenkamp J.E.M., Kumar N. (1998), *Generalizations about Ttrust in Marketing Channel Relationships using Meta-analysis*, International Journal of Research in Marketing, Vol. 15

Geyskens I., Steekamp J.E.M., Scheer L.K., Kumar N. (1996), *The effects of Trust and Interdependence on Relationship Commitment: A Trans-atlantic Study*, International Journal of Research in Marketing, Vol. 13

Hakansson H., Snehota I. (1995), *Developing relationships in Business Networks*, London, International Thompson Business Press

Jap S.D. (1999), *Pie-Expansion Efforts; Collaboration Processes in Buyer-Seller Relationships*, Journal of Marketing Research, Vol. XXXVI

Johnson-George C., Swap W.C. (1982), *Measurement of Specific Interpersonal Trust: Construction and Validation of a Scale to Assess Trust in a Specific Other*, Journal of Personality and Social Psychology, vol. 4

Kahneman D., Tversky A. (1979), *Prospect Theory: An Analysis of Decision under Risk*, Econometrica, n.47

Kumar N., Scheer L.K., Steenkamp J.E.M. (1995), *The Effects of perceived Interdependence on Dealer Attitude*, Journal of Marketing Research, Vol. XXXII

Lewicki R.J., Bunker B.B. (1996), *Developing and Maintaining Trust in Work Relationships*, in Kramer R.M. e Tyler T.R. (editors), *Trust in Organizations: Frontiers of Theory and Research*, Sage, Thousand Oaks

Luhmann N., (1988), *Familiarity, Confidence, Trust: Problems and Alternatives*, in Gambetta D. (editor)., *Trust. Making and Breaking Cooperative Relations*, Blackwell Inc., N.Y.

Morgan R. M., Hunt S. (1999), *Relationship-Based Competitive Advantage: The Role of Relationship Marketing in Marketing Strategy*, Journal of Business Research, Vol. 46

Morgan R. M., Hunt S. (1994), *The Commitment-Trust Theory of Relationship Marketing*, Journal of Marketing, Vol. 58

Sheppard B.H., Sherman D.M. (1998), *The Grammars of Trust: A Model and General Implications*, Academy of Management Review, Vol. 23, July

Tversky A., Kahneman D. (1986), *Rational Choice and the Framing of Decision*, Journal of Business, n.59

Tversky A., Kahneman D. (1981), *The Framing of Decision and the Psychology of Choice*, Science, n.211

Weitz B.A e Jap S.D. (1995), *Relationship Marketing and Distribution Channels*, Journal of the Academy of Marketing Science, Vol. 23

Wicks A., Berman S., Jones T. (1999), *The Structure of Optimal Trust: Moral and Strategic Implications*, The Academy of Management Review, Vol. 24

Zaheer A., McEvily B., Perrone V. (1998), *Does Trust Matter? Exploring the Effects of Interorganizational and Interpersonal Trust on Performance*, Organization Science, Vol. 9, n.2