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# **The Illusion of Trust and Performance**

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# The Illusion of Trust and Performance\*

Benoit A. Aubert<sup>†</sup>, Barbara L. Kelsey<sup>‡</sup>

## Résumé / Abstract

La confiance a régulièrement été considérée comme un facteur clef lié au bon fonctionnement des équipes ou des organisations virtuelles. Cette étude démontre que le niveau de compétence et l'intégrité sont des pré-requis à la confiance. Elle démontre toutefois que la performance des groupes de travail n'est pas reliée directement à l'établissement de la confiance.

*Trust has been deemed to be critical in ensuring the efficient operation of virtual teams and organizations. This study empirically verified ability and integrity as being antecedents of trust formation in virtual teams. However, effective team performance was found to be independent of the formation of trust.*

**Mots Clés :** Confiance, théorie de l'agence, étude empirique, organisation virtuelle

**Keywords:** Trust, agency theory, empirical study, virtual organization

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## **Introduction**

Organizations today are being transformed. Recent advances in information systems technology, combined with a more flexible approach to organization design, have led to an increased number of people working away from their colleagues. Information technologies are making possible new organizational forms, while at the same time eradicating the notion of distance, and compressing the time required to circulate information among teams and departments. The Internet allows people from around the world to work together on a common project for very little cost. More and more, enterprises have employees who are not physically present at the traditional premises of the organization. They work at their clients' location, in satellite offices (where the costs are lower), or simply at their homes. Hence, many employees now work on teams that seldom, if ever, meet face-to-face. These teams have the same responsibilities and challenges that regular ones do, plus they have the added challenge of managing the efforts, dynamics and processes of a team that may only meet in cyberspace.

These dispersed arrangements are affecting more and more large organizations. For example, airline companies are profiting from the comparative advantages of several countries. Thus, Swissair manages their point system for "frequent flyers" from Bombay. American Airlines runs their accounting operations in Barbados. More than 1,000 employees work there and they are linked, via satellite, with the rest of the company's offices. Likewise, Anderson offers information services to Continental, Delta and Air Canada. The computers on which these operations are executed are in Minneapolis while the employees who perform all the tasks required to perform these operations are in Mexico (Donoghue, 1993).

## **Theoretical Framework**

While virtual organizations have taken on more importance in recent years, dispersed collaboration has existed in most periods. As early as the Middle Ages, trade relied on coalitions of dispersed collaborators (Greif, 1989). Trust in these commercial partners and their fulfillment of promises, at a time when information could take months to travel from one partner to another, relied on the reputation of the partner and promises of future trading.

Similarly, for more modern collaborators, most writers contend that trust is a determining factor in the effectiveness in any complex system requiring coordinated action (Fukuyama, 1995; Seabright, Levinthal & Fishman, 1992). For example, trust in a contractual relationship can facilitate the exchange of information and bring about a reduction in control and its associated costs (Zand, 1972) since the parties do not have to fear any manifestations of opportunism (Granovetter, 1985; Hill, 1990; Nooteboom, Berger & Noorderhaven, 1997). Yet, Simon (1991) has indicated that the notions of trust and loyalty have not been sufficiently considered in economic approaches, while only recently have management and organizational behaviour researchers begun any in-depth investigations of trust (e.g. Mayer, Davis & Schoorman, 1995; McAllister, 1995). Our research is designed to increase our understanding of the role of trust in virtual teams from both an economic perspective and an organizational behavioural one.

One key component in a successful virtual team is the ability of the team members to deliver the promised work. It is generally assumed that a critical factor in the successful completion of a project is trust in fellow team members to deliver their share of the work on time and with sufficient quality (e.g. Jarvenpaa, Knoll & Leidner, 1998). Agency theory provides some insight into the dynamics that could be involved in the formation of this type of trust.

Two main thrusts of agency theory are the ability to trust and the contract conditions most conducive to motivating the agent to perform the agreed-upon work to the principal's satisfaction. In all transactions between two parties, the economic partners act in their own best interests. This opportunism signifies that control mechanisms and incentives must be in place to ensure that they respect the terms of the agreement. The parties are limited by bounded rationality and they cannot foresee all the contingencies bound to a contract (Williamson, 1985). In every contract, it is possible that the agent will not exert maximum effort, or that he will cheat on the value of the services rendered. Each party may not have any other choice but to monitor the other parties or to establish incentive mechanisms to motivate the collaborators. All these mechanisms are expensive. The agency costs represent the costs of writing contracts, costs of applying contractual clauses (e.g. surveillance, incentives, etc.), and the lost residuals resulting from imperfectly coordinating and motivating the contracting parties (Eisenhardt, 1989; Jensen & Meckling, 1976; Milgrom & Roberts, 1992; Sappington, 1991). The formation of trust is desirable since it reduces the costs of monitoring and controlling, hence making the transaction more efficient.

Many of these elements, notably all the aspects of control, assume that observation is feasible. In a virtual team context, observing other team members' efforts is impossible. The Mayer, Davis and Schoorman (1995, p. 712) definition of trust encapsulates the dilemma faced by virtual teams. They define trust as: "the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, *irrespective of the ability to monitor or control that other party*" (italics added). High trust, if justified, would enable virtual teams to work efficiently, without incurring high agency costs.

McAllister (1995) developed a theoretical framework which incorporated the impact of trust formation and monitoring on performance. He viewed trust having both cognitive and affective foundations. Cognition-based trust is based on the factual knowledge the trustor has of the trustee (which closely parallels agency theory's conceptualization of trust), while affect-based trust consists of the emotional bonds between people. He found that the formation of cognition-based trust was positively correlated with the formation of affect-based trust and preceded its development. Affect-based trust in turn had a significant impact on need-based monitoring and citizenship behaviour, both of which were significantly related to the performance levels of the managers in his study.

Mayer et al (1995) viewed three different antecedents as being critical to trust formation: the trustee's perceived ability, benevolence and integrity. They postulated that integrity would have the most impact in the early stages of relationship, while the impact of benevolence on trust formation would increase over time. While not explicitly stated, Mayer et al seem to view the

impact of ability on trust formation as remaining constant over the course of the relationship (Kelsey, 1999). A personality characteristic of the trustor, propensity to trust, was thought to moderate the impact of these three antecedent on trust formation, as well as being an antecedent itself. Propensity to trust was thought to remain stable throughout a relationship. Jarvenpaa et al (1998) tested the Mayer et al model in their research study on trust formation in global virtual teams and found support for this model. They did not test any links with performance.

This current research tested the relationships among the antecedents of trust, trust formation and performance outcomes. First, the antecedents of trust, as presented in Mayer et al (1995) and in Jarvenpaa et al. (1998) were formally tested in a longitudinal manner, evaluating their relationships with trust at the beginning of a project in a virtual environment and assessing again the same relationships at the end of the project. Hence the first three hypotheses were designed to test Propositions 2, 3 and 4 from Mayer et al (1995, p. 720 & 722), while the fourth hypothesis was designed to test the proposition that as virtual teammates worked together and acquired more knowledge about each other, trust would grow.

Hypothesis 1: Trust for a trustee will be a function of the trustee's perceived ability, benevolence and integrity, and of the trustor's propensity to trust.

Hypothesis 2: The effect of integrity on trust will be most salient early in the relationship prior to the development of meaningful benevolence data.

Hypothesis 3: The effect of perceived benevolence on trust will increase over time as the relationship between the parties develops.

Hypothesis 4: The level of trust among local and remote teammates would increase as the project progressed.

Second, the link between trust and performance was also assessed. Building on McAllister's (1995) work, it was hypothesized:

Hypothesis 5: The level of trust among teammates will be positively associated with effective performance.

## **Methodology**

### *Sample*

Business students from two universities took part in this study. One of the universities is located in Toronto, Ontario, and the other in Montreal, Quebec. In total, 71 students participated in the study, which resulted in 68 sets of usable questionnaires being completed. All these students were in either the third or fourth year of their bachelor degree. The students self-selected their local teammates, but were randomly grouped into eleven virtual teams composed of students from both Montreal and Toronto. They were asked to conduct a research project and submit a formal report at the end of the semester. The typical team was consisted of three students from each university.

Since there were more Montreal students than Toronto students, some teams had four students from Montreal and others had only two students from Toronto.

The students had three months to produce a research paper on a topic of their choice. A list of potential topics was provided. Deadlines were also given. Teams had to write an abstract of their paper early in the process in order to verify that they were on a promising track. To communicate, they had access to a web site with several chat rooms and to email. The papers were graded, and the results accounted for a significant part of their final evaluation for their course. All students in a team received the same grade (in Montreal and in Toronto). It was clearly presented and implemented as a joint project.

In order to assess the variables, the measures used were those of Jarvenpaa et al. (1998). Questionnaires were completed at the beginning of the project, to assess the initial trust participants had in their colleagues, and at the end of the project, to assess the trust they had after completing their task. Measures were taken for two groups. First, respondents were asked to answer the questionnaire for their local partners. Then, they answered the same questionnaire with respect to the members of their team in the other university (the remote group). Therefore, four sets of data were collected:

1. Initial measure—local members
2. Initial measure—remote members
3. Final measure—local members
4. Final measure—remote members

The measures, as shown in Table 1, presented great level of reliability. Only one item, from the propensity to trust measure, was dropped after the reliability analysis. The measures are provided in Appendix (all items were answered on a 1-7 scale).

**Table 1: Reliability (Cronbach Alpha)**

	Initial		Final	
	Local	Remote	Local	Remote
Ability	0.92	0.92	0.88	0.92
Benevolence	0.72	0.91	0.87	0.94
Integrity	0.86	0.90	0.79	0.90
Propensity to trust	0.69	0.82	0.82	0.74
Trust	0.81	0.68	0.80	0.79

## *Analysis*

In order to compare the levels of trust among the different sub-groups (local members and remote members), T-tests were performed. To validate the antecedents of trust, Partial Least Squares (PLS), a second generation multivariate method, was used. First generation multivariate methods, like multiple regression, factor analysis, analysis of variance and others help evaluate constructs and relationships between constructs. However, such an evaluation has to be performed in subsequent steps. Other methods, called second generation methods (Fornell 1984) perform analysis of a model as a whole instead of simply evaluating each relationship separately. Instead of simply aggregating measurement error in a residual error term, these methods simultaneously evaluate both the measurement model and the theoretical model. They adjust the relationships among the variables accordingly (Aubert, Rivard, and Patry, 1996). Two of these newer methods, and probably the most popular ones, are covariance structure analysis (most often referred to as LISREL) and partial least squares (PLS). PLS presupposes no distributional form of the data.

The required sample size for analysis is 10 times the number of items in the largest construct. Five times the largest construct is considered adequate but less stringent (Gopal, Bosrom and Chin, 1992). In this research, the largest construct is Ability, with six items. The sample (68 respondents) was deemed adequate. It exceeds the 10 to 1 ratio for all the constructs.

## **Results**

### *Trust*

A first examination of the results shows an interesting fact. Initially, the students tended to put more trust in their team members from their own university, as shown in Table 2. The difference between the level of trust in the local members of the team and the level of trust in the remote members of the team is significant. The initial difference could be attributed to the lack of knowledge the students had of their remote partners. It is safe to assume that they knew most of their local partners from previous courses taken in the same program.

**Table 2: Trust Levels**

<b>Level of Trust</b>	<b>Initial</b>	<b>Final</b>
Local team members	4.81	4.99
Remote team members	3.52	3.23
Level of sig. (local – remote)	.000	.000

If this hypothesis were true (the lower level of trust was attributable to the lack of knowledge), the level of trust in the remote teammates should increase with time, after several interactions with the team members. Looking at the results, it is clear that the frequent interactions (over more than three months) were not sufficient to increase trust. The results



indicate that the difference between trust put in local members versus remote members did not decrease. In fact, the opposite occurred, the difference went from 1.26 to 1.83 (on a 1-7 scale). Interestingly, this increased difference is due to two combined effects. First, the trust in the local team increased significantly ( $p < .05$ ) while the trust in the remote team decreased slightly (but the difference was not significant at the .05 level). Thus, hypothesis 4 was disproved.

#### *Antecedents of Trust*

When observing the antecedents of trust, a very similar pattern is observable (Table 3). All independent variables show stronger numbers for the local team members than for the remote partners. In all cases, the difference between the two sub-groups is significant. This is observable for both the initial and the final evaluations. This trend, observable for the trust level and its antecedents, indicates that virtual teams failed to establish the necessary conditions for trust to develop effectively during the process.

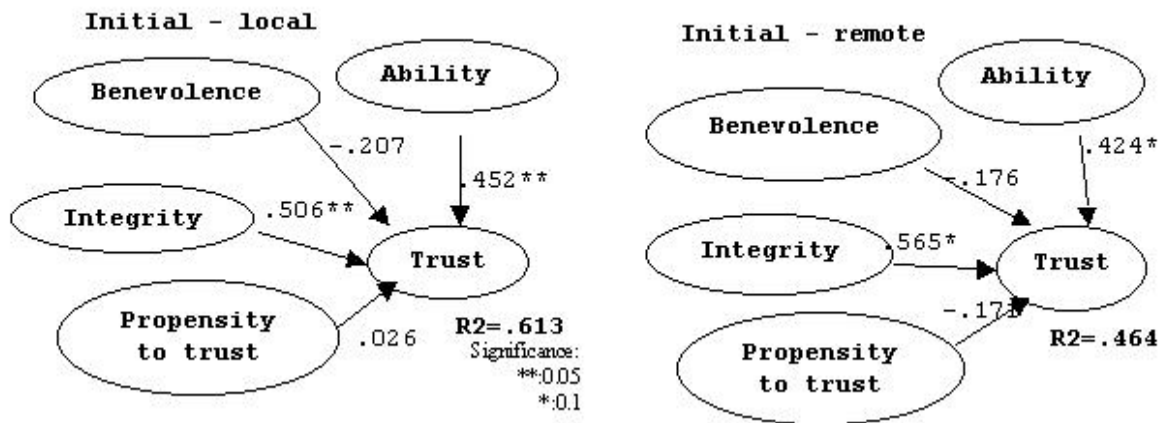
**Table 3 : Means and Significance of Difference – Independent Variables (Initial – Remote)**

	Initial			Final		
	Local	Remote	Sig.	Local	Remote	Sig.
Ability	5.59	4.49	.000	5.81	4.07	.000
Benevolence	5.81	4.83	.000	5.89	4.54	.000
Integrity	5.63	4.50	.000	5.67	4.04	.000
Propensity to trust	5.05	4.73	.029	5.23	4.41	.000

#### *Relationships Between Trust and Antecedents of Trust*

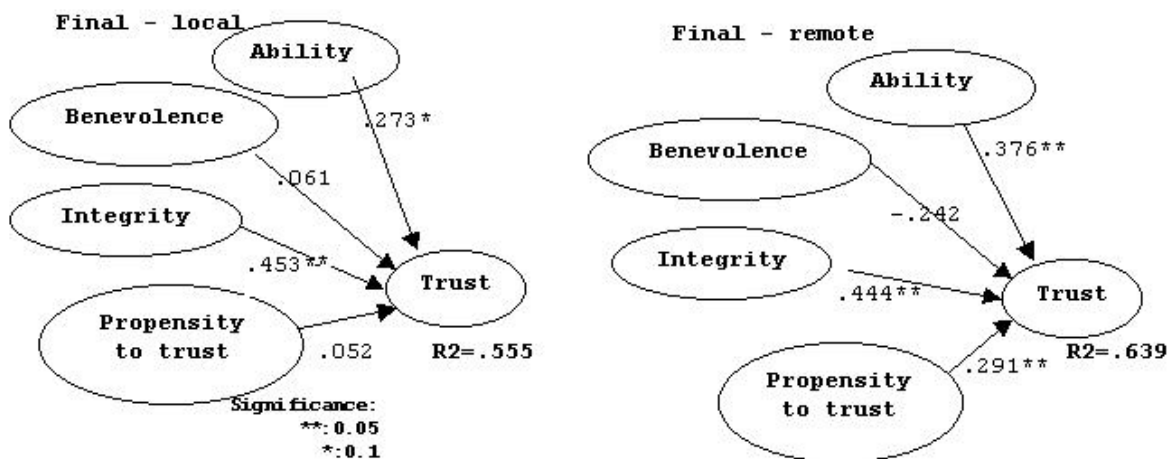
When observing the relationships between the antecedents of trust and trust, several elements can be noted. First, the elements pertaining to the initial evaluation will be mentioned, followed by the analysis of the final evaluation. It is interesting to note that, in all cases, the percentage of variance explained in the PLS models is very good, ranging from 46% to 64%.

Figure 1 reveals the similarity between the patterns (PLS) observed for local and remote members of the teams in the initial evaluation. In both the local and the remote evaluations, integrity shows the strongest link with trust. The second significant link is the one between ability and trust. It was hypothesized that integrity would have the strongest link at the beginning of the team life and that the influence of ability would be constant. The propensity to trust does not appear to influence trust, nor does the benevolence (the link is negative, but not significant).



**Figure 1: Initial Evaluation**

When observing the final evaluations, the pattern is very stable for the local team members. Integrity still plays the strongest role, and ability comes in second. For the remote team, integrity remains the strongest driver, followed by ability. The main difference is in the role of the propensity to trust. For the first time, this variable presents a significant link, in the direction expected, with trust. Thus, Hypothesis 1 received only partial support; perceived ability and perceived integrity were positively linked to the formation of trust, but perceived benevolence was not. Propensity to trust was only significant in one of the four evaluations. Hypotheses 2 and 3 were not supported, as integrity remained the strongest driver to explain trust and benevolence never had a significant effect on the level of trust, not even at the end of the project.



**Figure 2: Final Evaluation**

## Performance

In order to evaluate performance, the links of the two measures of trust (initial and final) with the success (the final score obtained for the project) were measured. Since trust was believed to have a positive effect for the whole duration of the project, it was relevant to try to assess the overall effect of trust. High trust at the beginning of the project should enable teams to start their work on better terms. Similarly, high trust at the end of the project would mean that trust was probably high during the last miles of the project, when critical decisions and work are made. Since we have these two measures (for both local and remote team members), each one was linked to performance in a causal model. The results are presented in Figure 3. Only one of the four links is significant (between final/remote trust and performance) and the variance explained is very limited (21.4%). Thus Hypothesis 5 was not supported; for three of the four evaluations of trust, there was no significant relationship between the trust levels among teammates and the effectiveness of their performance.

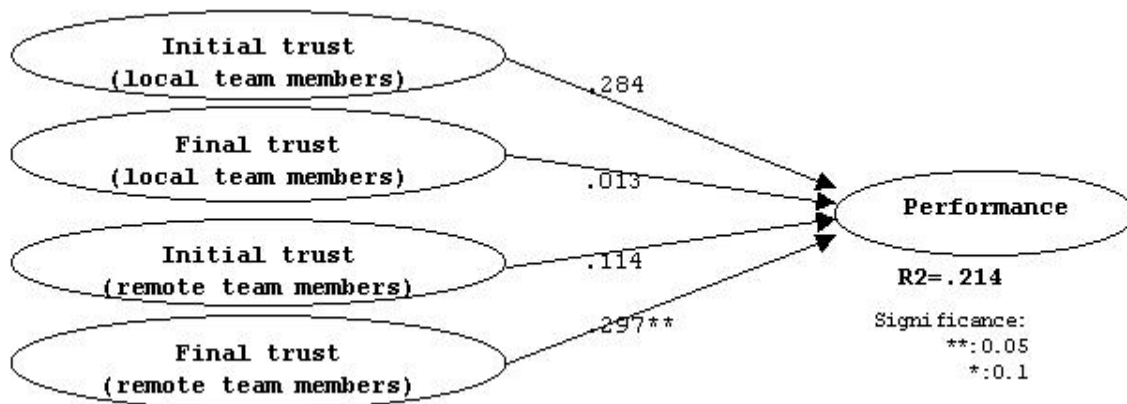


Figure 3: Trust and Performance

## Discussion

Many interesting elements can be extracted from the results. First, it appears that trust among the members of a team having the opportunity to meet face to face is consistently higher than trust with the members with whom the interactions are strictly virtual. This result was obtained even if teams had access to a rich environment (mail, chat, forums, web site, exchange of photos on the web site, etc.) to increase the quality of their interactions. The results also indicate that, contrary to what was anticipated, trust among interacting parties does not increase with time and number of interactions. In fact, results showed that trust increased among sub-groups interacting face to face but decreased among members meeting only in cyberspace. This suggests a major lesson for organizations establishing virtual teams. It means that face to face interactions should be organized for team members once in a while, to ensure that trust can be maintained or increased within the teams. Intensive IT usage, avatars or pictures are not sufficient to foster trust. These

differences were observed for teams composed of members with similar backgrounds, having mostly the same citizenship and the same culture. The gap would probably be even larger for teams comprised of team members from very disparate cultures, countries, languages, etc.

The second main element emerging from the results pertains to the antecedents of trust. These variables had systematically higher values for local team members than for remote team members and the differences increased with the passage of time. Rather than increasing the perceived ability, benevolence and integrity of remote team members, interaction (or lack thereof) with remote teammates actually decreased the perceived levels. Perhaps the inability of the local partners to monitor what the remote partners were actually doing contributed to fundamental attribution errors (Miller & Lawson, 1989) being made. Fundamental attribution error casts the actions of others in a less positive light than actual facts would indicate. Additional effort is required to avoid making this type of error—effort which may not have been expended by the remote teammates. This indicates that members of virtual teams need to concentrate on exerting extra effort to overcome the limitations on building relationships inherent in virtual interaction, an observation that reinforces the findings of Jarvenpaa et al (1998).

When observing the links between the antecedents of trust and the trust level, we observed that integrity was the key driver for trust. In all cases (local, distant, *ex ante* and *ex post*) integrity had the strongest significant link with the trust level. The fact that integrity remained the key driver over time contradicts the expectations. It was anticipated that, with time, the role of integrity would decrease while the role of benevolence would increase. The results showed that while integrity remained the strongest link, the impact of benevolence over time failed to materialize. One possible explanation would be that the project was not long enough (3 months). However, the interactions among team members were intense and a change in patterns among antecedents, if anticipations were true, should have been observed.

These observations are consistent with the cognitive trust usually associated with economic behavior (and agency theory). Integrity means that the partners are perceived as not being “cheaters,” while ability corresponds to the competence of agents. The common goal, established in the design of the experiment itself, provided the appropriate incentive structure. Thus, trust formation appears to be a very rational conclusion.

Finally, the last interesting element is the lack of influence of trust on the team performance. High performance teams could have a very low trust level, and low performance teams could maintain a high trust level. Only one of the four measures of trust reached significance, and that was the final rating of trust among remote team members. When observing the results presented in Figure 3, the first element that emerges is the very low percentage of the variance explained (21%). Trust is, therefore, a very poor predictor of performance and definitely not an antecedent of success.

Thus, it appears that while trust is valued and reduces the effort required from the team members, it does not ensure the attainment of the results when the stakes are high. Put another way, lack of trust (or distrust) does not prevent a team from delivering quality results. The teams managed to hand over a deliverable corresponding to their capabilities, with or without trust. To verify if this

hypothesis is true, the effort required to produce the final report should have been measured. This measurement would have helped to determine if it was additional effort that was the key driver in delivering a quality result by compensating for the lack of trust. This provides an interesting path for future research and a potential refinement the understanding of the trust-performance relationship.

## **Conclusion**

This paper assessed the relationship among the antecedents of trust and the level of trust formation in virtual teams, as well as the relationship between trust and performance. The empirical findings revealed that the perceived ability, integrity and benevolence of remote teammates were significantly lower than the ratings of local teammates, and that this gap increased as the projects proceeded. Trust was also higher among local teammates than among the remote partners. Finally, the results indicate that the formation of trust is not necessary for a virtual team to deliver a quality result. The results of this research have revised our understanding of the role of trust in facilitating effective performance and point to the importance of improving our understanding of the complex relationship that exists between effort exerted, ability, trust and final performance levels.

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## Appendix A

### Trust Survey Measures (Adapted from Jarvenpaa et al, 1998)

#### *Trust*

If I had my way, I wouldn't let the other team members have any influence over issues that are important to the project. (*reversed*)

I would be comfortable giving the other team members complete responsibility for the completion of this project.

I really wish I had a good way to oversee the work of the other team members on the project. (*reversed*)

I would be comfortable giving the other team members a task or problem that was critical to the project, even if I could not monitor them.

#### *Ability*

I feel very confident about the other team members' skills.

The other team members have much knowledge about the work that needs to be done.

The other team members have specialized capabilities that can increase our performance.

The other team members are well qualified.

The other team members are very capable of performing their tasks.

The other team members seem to be successful in the activities they undertake.

#### *Benevolence*

The other team members are very concerned about the ability of the team to get along.

The outcomes of this project are very important to the other team members.

The other team members would not knowingly do anything to disrupt or slow down the project.

The other team members are concerned about what is important to the team.

The other team members will do everything in their capacity to help the team perform.

*Integrity*

The other team members try hard to be fair in dealing with one another.

The other team members have a strong sense of commitment.

I never am doubtful about whether the other team members will do what they promised.

I like the work values of the members on this team.

The other team members do not behave in a consistent manner – I am never sure if they are going to do what they promise or not. (*reversed*)

The other team members display a solid work ethic.

*Propensity to Trust*

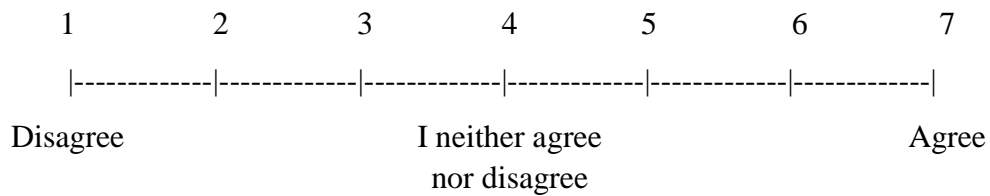
One should be very cautious when working with students. (*reversed*) - dropped

Most students tell the truth about the limits of their knowledge.

Most students can be counted on to do what they say they will do.

Most students are honest in describing their experiences and abilities.

*Scale for all questions:*





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