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Trust Violation and Repair (12oe):

Project Summary and Closeout Report

Megan M. Thompson

Defence R&D Canada

Technical Memorandum

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Project Summary and Closeout Report

Megan M. Thompson
DRDC Toronto

Defence R&D Canada – Toronto

Principal Author

Megan M. Thompson

Defence Scientist, Collaborative Performance and Learning Section

Approved by

Joe Baranski

Section Head, Collaborative Performance & Learning Section

Approved for release by

K.C. Wulterkens

for Chair, Document Review and Library Committee

Abstract

The purpose of the current report is to summarize the work conducted within Project 12oe 'Trust Violation and Repair'. The report begins with a review of the project objectives and provides some background as to the genesis of the work conducted within this project. The major pieces of work undertaken within this project are outlined as are the major findings from each of these milestones. These include a measure validation study completing the development of the *Trust in Teams Scale* and the *Trust in Leaders Scale*. Two empirical studies on the nature of trust violation and repair, one investigating the phenomenon of category-based trust (i.e., swift trust), violations and repair in distributed teams, with a further study exploring similar trust dynamics in culturally diverse teams were also conducted as part of this research project. As well, this project involved the development of trust violation scenarios relevant to a military (infantry) context. Knowledge Transfer aspects of the work conducted within this project, including two publications with the Canadian Forces Leadership Institute and international dissemination of the trust measures, are also outlined. I conclude with lessons learned and suggestions for future research within this area.

Résumé

Le rapport vise à résumer les travaux réalisés dans le cadre du Projet 12oe, *Abus de confiance et restauration de la confiance*. Il commence par passer en revue les objectifs du projet et donner un aperçu du contexte des travaux réalisés. Les principaux jalons du projet sont présentés, de même que les grandes constatations qui en découlent. Il est question notamment d'une étude de validation des mesures, qui complète l'élaboration de l'*échelle de confiance envers les équipes* et de l'*échelle de confiance envers les chefs*. Deux études empiriques portaient sur la nature de l'abus de confiance et de la restauration de la confiance : une d'entre elles a permis d'étudier le phénomène de la confiance fondée sur l'identité (p. ex., la confiance instantanée), une autre, l'abus et la restauration de la confiance au sein d'équipes réparties, et la dernière, la variation de la confiance au sein d'équipes diversifiées au plan culturel. Dans le cadre du projet, on a aussi élaboré des scénarios d'abus de confiance pertinents pour les militaires (infanterie). Le rapport fait état du transfert du savoir découlant des travaux réalisés, notamment de deux documents publiés en collaboration avec l'Institut de leadership des Forces canadiennes et de la diffusion des mesures de confiance à l'échelle internationale. En conclusion, on propose des leçons retenues et des pistes de recherche connexes.

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Executive summary

Trust Violation and Repair (12oe): Project Summary and Closeout Report

Megan M. Thompson; DRDC Toronto TM 2008-089; Defence R&D Canada – Toronto; September 2008.

Background: The purpose of the current report is to summarize the work conducted within Project 12oe *Trust Violation and Repair* that continued the work begun in 16kk Trust which laid important conceptual and psychometric foundations exploring the nature and role of trust in small military teams, specifically at the infantry section level. Major results of 16kk were the creation and validation of a trust in small teams and trust in leader scale. It also emphasized the fundamental role trust is afforded among military personnel. More specifically, it was clear that trust violations could occur within military contexts and could have important implications for perceptions of teamwork, morale and risk. Following on from this earlier work, the objectives of the *'Trust Violation and Repair'* project under PG2 (formerly CG2) were to:

1. continue development of the Adams model of trust in small Land Force (LF) teams,
2. understand the conditions under which trust violations occur,
3. understand the psychological consequences of trust violations,
4. identify methods for repairing such violations, and
5. extend the model to soldier trust in the LF organization.

The approach taken to achieve these objectives incorporated the following elements:
- Literature survey,
- Trust scenario development,
- Experiments which might be conducted in laboratory or field settings.

Major Deliverables: Major deliverables for this ARP included final validation that completed the development of the *Trust in Teams Scale* and the *Trust in Leaders Scale*. To date the scales have been disseminated at international meetings and will be used in future research within the CF, the United States and Australia. A draft paper is underway for journal publication within the next year. In addition, a separate user's manual was developed to accompany use of the scales.

Additional work was directed toward the piloting of trust violation and repair scenarios that might be used in future training development. Four preliminary trust violation scenarios were scripted specifically to reflect important theoretical dimensions of trust and formal military subject matter expert (SME) feedback and critique was elicited. This feedback occurred in five focus groups with 19 Canadian Forces (CF) personnel who participated for up to 3 hours. Soldiers provided feedback both individually through questionnaires and collectively through focus groups. Questionnaire data provided strong support for the validity of these four draft scenarios. All scenarios were reported to dramatically reduce trust in a leader, and each scenario tapped the expected trust dimension(s). Importantly, participants also rated the scenarios to be realistic and easy to follow. Participants also provided valuable suggestions (e.g. about equipment and speech) that would further improve

scenario realism. As a whole, these questionnaire results and participant feedback support the construct validity of these scenarios. Just as importantly, these preliminary results revealed our participants indicated that trust violations should always be admitted and addressed, rather than denied, at least in the scenarios depicted here.

Two empirical trust studies investigated the nature of trust violation and repair in the context of category based (i.e., 'swift trust'). In an initial study 24 teams of CF reservists each conducted four tactical assault missions in a first-person gaming laboratory. Each 4-person team was composed of 2 CF personnel and 2 confederate researchers (purported to be CF personnel). Members of the team worked in a simulated distributed environment, and were initially introduced to each other only using a 1 page written profile that described their background and operational experience. Their task was to operate as 2 separate fire teams approaching the target area from 2 different sides in order to engage and destroy terrorists. Major results demonstrated the initial effects of category based trust, although initial levels of team trust were relatively high in both teams. Specifically, team members expected to accrue fewer casualties when working with team members they believed to be from their own regiment than from a different regiment. Part way through the mission, however, shared regimental identity had no impact on team trust although the perceived skills of team members were influenced by violations. Post-mission, team trust measures showed very weak impacts of regimental identity. Team trust as a whole increased slowly over the course of the mission, regardless of regimental identity or the occurrence of a trust violation. Possible theoretical accounts of these findings and lessons learned are explored and future research and training implications are addressed.

A further study explored similar trust dynamics in culturally diverse teams. 106 CF reservists read scenarios detailing missions within a multinational coalition teamwork operation with an unfamiliar teammate who was from a culture that is either relatively similar to Canada (i.e., United States), or from a different (i.e., Bulgaria), or very different (i.e., Sierra Leone) national culture. In half of the missions, the teammate was depicted as committing a potential trust violation, with the other half of the missions having no violation. Findings again showed an initial 'swift trust' effect in that participants had more initial confidence in their team partner and marginally more trust in their team when their teammate was from a similar culture. However, trust violations had a strong and consistent impact, while the role of cultural identity became less pronounced. Overall, when teammates committed a trust violation they were seen as less trustworthy, and willingness to risk and expectations decreased, and this overrode the initial effects of culture group. Possible theoretical accounts and implications for CF training are addressed.

Knowledge Transfer: We have also worked to ensure the knowledge transfer aspects of the work conducted within this project. These efforts include two publications with the Canadian Forces Leadership Institute, a user's manual for the Trust in Teams and the Trust in Leaders scales, a journal article manuscript and international dissemination of the trust measures.

Future Research Directions: The Trust in Teams and Trust in Leaders Scales are currently in use within the Optimized Battle Group Applied Research Project within PG2. Integrating the directions of both the Command Thrust within PG2 and the Collaborative Performance and Learning Section of DRDC Toronto, a major focus of future research will explore the development and maintenance of interagency trust in JIMP/Whole of Government approaches to operations.

Sommaire

Trust Violation and Repair (12oe): Project Summary and Closeout Report

Megan M. Thompson; DRDC Toronto TM 2008-089; R & D pour la défense Canada – Toronto; Septembre 2008.

Contexte : Le rapport vise à résumer les travaux réalisés dans le cadre du Projet 12oe, *Abus de confiance et restauration de la confiance*. Les travaux du Projet 12oe découlent de ceux entamés durant le Projet 16kk sur la confiance, qui a jeté d'importants fondements conceptuels et psychométriques concernant la nature et le rôle de la confiance dans les équipes militaires restreintes, plus particulièrement au niveau de la section d'infanterie. Les résultats marquants sont la création et la validation d'une échelle de confiance envers les petites équipes et d'une échelle de confiance envers les chefs. Ces travaux ont également mis en relief le rôle fondamental qu'exerce la confiance pour le personnel militaire. Plus précisément, il était évident que des abus de confiance pouvaient se produire dans des contextes militaires et avoir une forte incidence sur les perceptions du moral de l'équipe et du risque encouru. Dans la foulée des travaux connexes antérieurs, les objectifs du projet « *Abus de confiance et restauration de la confiance* » relevant du GP2 (autrefois le GC2) étaient les suivants :

6. poursuivre l'élaboration du modèle Adams de confiance envers les petites équipes de la Force terrestre;
7. comprendre les conditions dans lesquelles les abus de confiance se produisent;
8. comprendre les conséquences psychologiques des abus de confiance;
9. trouver des moyens de rétablir la confiance;
10. appliquer le modèle à la confiance des soldats envers l'organisation de la FT.

Pour atteindre ces objectifs, les éléments ci-après ont été intégrés :
- examen de la documentation publiée;
- élaboration de scénarios de confiance;
- expériences pouvant se faire en laboratoire ou sur le terrain.

Principaux résultats attendus : Parmi les principaux résultats attendus de ce PRA, mentionnons une validation définitive permettant de conclure l'élaboration de l'*échelle de confiance envers les équipes* et de l'*échelle de confiance envers les chefs*. Ces échelles ont été distribuées à l'occasion de réunions internationales, et elles serviront à de futurs travaux de recherche dans les FC, aux États-Unis et en Australie. L'ébauche d'une communication est en préparation et celle-ci sera publiée dans un périodique au cours de l'année. On a aussi élaboré un guide à l'intention des utilisateurs des échelles.

D'autres travaux visaient à faire l'essai de scénarios d'abus de confiance et de restauration de la confiance pouvant servir à l'instruction. On a élaboré quatre scénarios préliminaires de confiance de manière à refléter les dimensions théoriques importantes de la confiance, puis l'on a cherché à obtenir la rétroaction et les critiques officielles d'experts militaires en la matière. Cette rétroaction a été obtenue à l'aide de cinq groupes témoins formés de 19 membres des FC dont la participation a

duré au maximum 3 heures. Les soldats ont exprimé leurs commentaires à la fois individuellement, au moyen de questionnaires, et collectivement, par l'entremise de groupes témoins. Les données du questionnaire ont fortement appuyé la validité de ces quatre scénarios provisoires. Il appert que tous les scénarios avaient pour effet de réduire sensiblement la confiance envers un chef, et chacun des scénarios a exploité les dimensions attendues de la confiance. Fait important, les participants ont trouvé les scénarios réalistes et faciles à suivre. Les participants ont également formulé des suggestions utiles (p. ex. concernant l'équipement et les dialogues) de nature à améliorer le réalisme des scénarios. Dans l'ensemble, les résultats du questionnaire et la rétroaction des participants soutiennent la validité conceptuelle de ces scénarios. Facteur tout aussi important, ces résultats préliminaires révèlent que de l'avis de nos participants, les abus de confiance devraient toujours être reconnus et réparés plutôt que niés, du moins dans le contexte des scénarios illustrés ici.

Deux études empiriques ont permis d'examiner la nature de l'abus de confiance et de la restauration de la confiance dans un contexte d'appartenance (c.-à-d., la « confiance instantanée »). Lors d'une première étude, 24 équipes de réservistes des FC ont effectué, chacune de leur côté, quatre missions simulées d'assaut tactique. Chaque équipe était composée de quatre personnes : deux membres des FC et deux chercheurs complices (censés être des membres des FC). Les coéquipiers travaillaient dans un environnement réparti simulé, et au départ, ils n'ont été présentés l'un à l'autre qu'au moyen d'un profil d'une page décrivant leurs antécédents et leur expérience opérationnelle. Ils étaient divisés en deux équipes de tir distinctes qui devaient s'approcher de la zone cible de deux côtés différents, puis attaquer et détruire un groupe de terroristes. Les principaux résultats montrent que l'identité au groupe peut influencer la perception initiale de la fiabilité des autres membres de l'équipe, même si le niveau de confiance des deux équipes était très élevé au départ. En particulier, les coéquipiers s'attendaient à subir moins de pertes s'ils étaient jumelés à des militaires qu'ils pensaient être de leur propre régiment. Pendant la mission, cependant, le fait d'appartenir au même régiment n'a pas eu d'impact sur le niveau de confiance au sein de l'équipe, bien que des abus de confiance aient influencé la perception de la compétence de certains coéquipiers. Après la mission, la mesure du niveau de confiance a montré que l'identité régimentaire avait très peu d'impact. La confiance au sein de l'équipe a augmenté lentement tout au long de la mission, quelle que soit l'identité régimentaire ou l'incidence des abus de confiance. On cherche une explication théorique aux résultats obtenus, on examine les leçons retenues et leur incidence sur les programmes d'instruction, et l'on envisage de nouvelles pistes de recherche.

Une autre étude a permis d'examiner la variation de la confiance au sein d'équipes diversifiées au plan culturel. On a fait lire à 106 réservistes des FC des scénarios de missions dépeignant une opération de coalition multinationale menée avec l'aide d'un coéquipier venant d'une culture relativement semblable à celle du Canada (p. ex., les États-Unis), d'une culture nationale différente (p. ex., la Bulgarie), ou d'une culture très différente (p. ex., la Sierra Leone). Pour la moitié des missions, un coéquipier commettait un abus de confiance, et pour l'autre moitié des missions, aucun abus n'a été commis. Les résultats témoignent à nouveau d'un effet initial de « confiance instantanée », c'est-à-dire que les participants ont manifesté de prime abord une plus grande confiance envers leur coéquipier et une plus grande confiance marginale envers leur équipe lorsque leur coéquipier provenait d'une culture apparentée à la leur. Cependant, les abus de confiance ont eu un effet marqué et soutenu sur leur perception, tandis que l'identité culturelle a pris moins d'importance. Somme toute, lorsque des membres de l'équipe abusaient de la confiance de leurs coéquipiers, ils étaient perçus comme moins dignes de confiance, et la volonté de prendre des risques de même que les attentes diminuaient, ce qui faisait obstacle aux effets originaux

de l'appartenance culturelle. On en examine les répercussions théoriques possibles sur l'instruction des FC.

Transfert du savoir : Nous avons aussi tâché d'assurer le transfert du savoir découlant des travaux réalisés dans le cadre du projet. Ces efforts ont abouti entre autres à deux publications en collaboration avec l'Institut de leadership des Forces canadiennes, un guide de l'utilisateur de l'échelle de confiance envers les équipes et de l'échelle de confiance envers les chefs, la rédaction d'un article de périodique et la diffusion des mesures de confiance à l'échelle internationale.

Travaux de recherche à venir : Les échelles de confiance envers les équipes et de confiance envers les chefs sont utilisées dans le cadre du Projet de recherche appliquée sur l'optimisation du groupement tactique, qui relève du GP2. En tenant compte des orientations à la fois du vecteur « Commander » du GP2 et de la section Performance collective et apprentissage de RDDC Toronto, les futurs travaux de recherche porteront principalement sur l'acquisition et le maintien de la confiance entre organismes dans le contexte des approches opérationnelles IIMP ou pangouvernementales.

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1 Project Background and Objectives

1.1 Background

The work undertaken within this Applied Research Project (ARP) '*Trust Violation and Repair*' (12oe) follows on from an earlier ARP '*Trust in Small Teams*' (16kx) conducted under the auspices of Partner Group (PG) 6. That earlier project primarily addressed the conceptual and modeling issues with respect to trust in small Army units, as well as the development of two scales for measuring trust in teams and trust in leaders within that context. This earlier work was executed entirely by Dr. Barb Adams of Humansystems Inc. Project 16kx began with a literature survey on Trust and the development of a preliminary conceptual model of trust.

This was followed by a focus group study with armoured crews at Petawawa and the development of preliminary trust scales, which were then tested in Petawawa with a separate group of respondents. Scale revision (two scales were being developed at this point, one for trust in team members and one for trust in the team leader) followed by a second validation study was also undertaken. In addition, a review of trust in automation was also completed. Further, a pilot experiment was run at Ft. Benning; and a trust and communication experiment was conducted in February 2004 in the First Person Gaming Laboratory at DRDC Toronto.

Thus, the work conducted within 16kx laid important conceptual and psychometric foundations exploring the nature and role of trust in small military teams, specifically at the infantry section level. Major results were the creation and validation of a trust in small teams and trust in leader scale. It also emphasized the fundamental role trust is afforded among military personnel. More specifically, it was clear that trust violations could occur within military contexts and that they could result in significant perceived disruptions concerning future risk taking and performance.

1.2 Objectives of the Current Applied Research Project

Following on from this earlier work, the objectives of the '*Trust Violation and Repair*' project under PG2 (formerly CG2) were to:

1. continue development of the Adams model of trust in small Land Force teams,
2. understand of the conditions under which trust violations occur,
3. understand the psychological consequences of trust violations,
4. identify methods for repairing such violations,
   and
5. extend the model to soldier trust in the LF organization.

The approach taken to achieve these objectives incorporated the following elements:
- Literature survey,
- Trust scenario development,
- Experiments which might be conducted in laboratory or field settings.

The original activities and milestones to be undertaken with this ARP are presented in Table 1.

Table 1: Trust Violation and Repair (12oe) - Major Deliverables.

FY	Deliverable	Activity	Contracts
05-06	1.	Literature review: Organizational Trust (e.g. trust within co-located teams, trust within NEOps environment, trust in culturally diverse teams, trust in organizations)	40k
	2.	Laboratory experiment: trust violations in dispersed vs co-located teams (e.g., 1st person Gaming Lab)	95k
06-07	3.	Scenario generation: trust violation at the team, leader and organizational levels	60k
	4.	Laboratory experiment: trust in diverse teams (e.g., joint/combined operations; multinational operations)	90k
	5.	Scenario-based laboratory experiments: trust violations between teammates and between leaders and team members	160k
07-08	6.	Field study: i) the relationship between trust in teams/leader and team performance; ii) and the relationship between leadership style and trust (e.g., CMTC)	160k
	7.	Validation study of organizational trust measure	50k
	8.	Development of scenario-based training materials to train military personnel in the handling of trust violations	60k
	9.	Creation of professional development seminar for Army leaders on the nature of trust in military teams and on building, sustaining, and repairing trust violations	60k

1.3 Amendments to the Trust Violation and Repair Applied Research Project Plan

Note that during the evolution of the project, and in response to feasibility concerns within the scope, time frame and budget of the ARP, it was decided to focus on trust violation and repair at the unit level, with only limited development of the work in the area of trust in the LF organization. Although the Organizational Trust literature review was undertaken and completed, the development and validation of an Organizational Trust measure was not pursued (Deliverable 7).

Further, due to CF operational tempo, and after exploration of the available possibilities such as the Canadian Manoeuvre Training Centre (CMTC), it was deemed unrealistic to attempt to focus on field research in these settings (Deliverable 6). Moreover, there was a lengthy delay in obtaining DLPCP authorization and participants for the first Swift Trust study. Indeed this resulted in a full year delay in this project. Thus, the decision was made to conduct as much work as possible in laboratory or quasi- laboratory venues in the area of trust in diverse teams, and knowledge transfer products. Finally, the completion of the Trust Development, Maintenance and Repair: Commanders Handbook with CFLI and a chapter on trust, both with CFLI Press, were deemed to constitute professional development materials as outlined in the project plan.

2   Major Deliverables

2.1   Trust Residuals

Adams, B. A. & Sartori, J. (2006). Validating the Trust in Teams and Trust in Leaders Scales. DRDC Toronto CR 2006-008.
Scientific Authority: Carol McCann

This work breakdown element within the Trust Violation and Repair project was devoted to completion of some outstanding issues from the previous ARP. The first deliverable was further analyses of the validation of the Trust Scales. These results confirmed the validity of the measures and completed the initial psychometric development of the measures.

The contractor was also required to provide DRDC with all data sets collected in the course of the trust ARP in PIAssist software format. However, due to problems with the PIAssist software, the contractor was unable to provide data sets in that format. However all data sets and variable names and variable labels were provided to the Scientific Authority in Excel format.

A third deliverable within this work breakdown element involved the completion of a short report offering practical guidelines to commanders on trust development and maintenance. This deliverable was expanded under the new project and contributed to the Commanders Handbook and a chapter in a Leadership Book, both in collaboration with Canadian Forces Leadership Institute (discussed below).

The final deliverable of this WBE involved the development and presentation of a summary of the results of this project. The PowerPoint presentation was completed and delivered to the Scientific Authority. However, scheduling problems due to CF reorganization delayed and ultimately precluded the presentation of the details of this project to CLS staff.

2.2   Trust Measures Paper

Adams, B. D., Bruyn, L. E., Chung-Yan, G., & Thompson, M. M. (2008). Creating and Validating Two Measures of Trust in Small Military Teams (manuscript in preparation).

Thompson, M. M., Adams, B. D., & Sartori, J. (2007). Measures of Trust in Small Military Teams. Paper presented at the International Military Testing Association Conference, October 8-12, 2007, Gold Coast Australia

The goal of this deliverable was to develop a peer-reviewed journal paper summarizing all of the work that went into the development and validation of the 'Trust in Teams and Trust in Leader' scales. Thus, this paper describes the creation of scales to measure a) trust in teams and b) trust in a team leader in the context of army infantry units. This work began with an examination of the existing literature on the measurement of trust in others, trust in a leader and trust in teams, and the implications for measure development are reviewed. The scale development process for the

trust in teams and trust in leader scales, including conceptual decisions, are then described. The results of a study exploring the psychometric properties of the first iteration of these scales are then presented and recommendations for further refinement are provided. A preliminary version of this was prepared in paper form and was presented as part of a symposium on Trust at the 2007 International Military Testing Association Conference. A draft manuscript based on this conference paper was also delivered to the Dr. M Thompson Scientific Authority for further revision and submission to a peer-reviewed journal.

2.3 Trust Measures User's Manual

Adams, B. D. Waldherr, S. and Sartori, J. (2008). Trust in Teams Scale , Trust in Leaders Scale: Manual for Administration and Analyses. (manuscript in preparation)
Scientific Authority: M. M. Thompson

This document is a user's manual for the administration and analyses of the Trust in Teams Scale and the Trust in Leaders Scale. It begins with a definition of trust and provides a background to the Trust in Teams Scale and Trust in Leaders Scale, outlining both pragmatic and conceptual considerations. It then briefly outlines the research conducted to develop and validate the measures. It concludes with a presentation of the items and format of both scales.

2.4 Trust Violation and Repair Scenario Development

Sartori, J., Adams, B. D., Waldherr, S., & Lee, K. (2007). Trust Violation Scenarios. DRDC Toronto No. CR-2007-176
Scientific Authority: M. M. Thompson

This pilot work was undertaken to develop realistic trust violation scenarios within a military context for future research and training purposes. The first part of this report reviews the relevant literature that addresses trust violations and describes the many different factors that influence these violations. This part of the report concludes with the observation that the literature related to trust violations is still relatively underdeveloped, and that additional empirical work will be required to understand the impact of trust violations within military teams.

The next section of the report begins the initial efforts of the research team to formulate leader-to-subordinate trust violation situations, and to validate these situations with military personnel. Four preliminary trust violation scenarios were scripted specifically to reflect important theoretical dimensions of trust and systematic military feedback and critique was elicited. This feedback occurred in five focus groups with 19 CF personnel who participated for up to 3 hours. Soldiers provided feedback both individually through questionnaires and collectively through focus groups.

Questionnaire data provided strong support for the validity of these four draft scenarios. All scenarios were reported to dramatically reduce trust in a leader, and each scenario tapped the expected trust dimension(s). Importantly, participants also rated the scenarios to be realistic and easy to follow. Participants also provided valuable suggestions (e.g. about equipment and speech) that would further improve scenario realism. As a whole, these questionnaire results and participant feedback support the construct validity of these scenarios. Just as importantly, these preliminary results revealed that, in contrast to the recent empirical results of Kim, Ferrin,

Cooper, & Dirks (2004), our participants indicated that trust violations should be admitted and addressed, rather than denied, at least in the scenarios depicted here.

2.5 Swift Trust I: Trust Violations in Diverse and Distributed Teams

Adams, B. D., Waldherr, S. Sartori, J. & Thomson, M. (2007). Swift Trust in Distributed Ad Hoc Teams. DRDC Toronto No. CR-2007-139
Scientific Authority: M. M. Thompson

This research study sought to explore the phenomenon of 'swift trust' and to determine the impact of this variable on trust violations. Swift trust is a recently popularized construct, and is defined as trust developed quickly even without direct and personal experience with another person. Swift trust has been increasingly posited in the literature to be one way in which members of ad hoc teams can quickly form trust (Meyerson, Weick & Kramer, 1996). More specifically, this pilot study explored whether the regimental identity of teammates could influence levels of "swift" trust within teams and the impact of potential trust violations.

Twenty-four teams of CF reservists each conducted four tactical assault missions in a first-person gaming laboratory. Each 4-person team was composed of 2 CF personnel and 2 confederate researchers (purported to be CF personnel). Members of the team worked in a simulated distributed environment (separated by partitions), and were initially introduced to each other only using a 1 page written profile that described their background and operational experience. Their task in the computer game was to operate as 2 separate fire teams approaching the target area from 2 different sides in order to engage and destroy terrorists. Teammates communicated via radio only but interacted within the simulated mission area through their computer avatars.

In order to manipulate regimental identity, the 2 confederate members of the newly formed and distributed team were reported to come from either the same regiment or a different regiment as the actual CF participants. In addition, to investigate whether trust violations affected the development of trust over the four missions, in half of the missions, a confederate team member performed a behaviour that could put the team at risk. Questionnaires assessed the impact of regimental identity and potential trust violations on levels of team trust before the mission began (pre-mission), during a mission freeze (about 5 min into the mission) and at the end or post-mission.

Results showed initial levels of team trust were significantly higher in distributed teams that shared a perceived common regimental identity, although initial levels of team trust were relatively high in both teams. This suggests that a perceived shared regimental identity promoted swift trust at the very early stages of working as a team. Team members expected to accrue fewer casualties when working with team members from their own regiment than from a different regiment. However, part way through the mission (i.e., 'mission freeze'), shared regimental identity had no impact on team trust although the perceived skills of team members were influenced by violations. At the post-mission stage, team trust measures showed very weak impacts of regimental identity. Team trust as a whole increased slowly over the course of the mission, regardless of regimental identity or the occurrence of a trust violation. These findings show that while regimental identity can influence immediate judgments of team trustworthiness, these effects may be relatively temporary. Possible theoretical accounts of these findings and

lessons learned are explored and future research and training implications are addressed. Understanding the swift trust construct will be critical as the CF moves toward increasingly dynamic, diverse and distributed operations.

2.6 Swift Trust II: Trust Violations in Culturally Diverse Teams

Brown, A.L., Adams, B. A., Famewo, J. J., & Karthaus, C. L. (2008). Trust in Culturally Diverse Teams. DRDC Toronto No. (manuscript in preparation)
Scientific Authority: M. M. Thompson

As the Canadian Forces becomes more culturally diverse and personnel are increasingly involved in complex multinational coalition operations, a critical issue is how military teams will be able to work efficiently and effectively despite the challenges posed by diversity. One of the major challenges for future military teams is that perceived differences among teammates could impede the development and maintenance of trust. This study investigates the impact of cultural diversity on trust in teams and on the management of trust violations within these teams.

106 Reserve force military personnel were asked to imagine themselves working in a multinational coalition operation with an unfamiliar teammate. They then received a profile of this hypothetical teammate that described the teammate's basic demographic information and experience, and this teammate was reported to be from a culture that is either relatively similar to Canada (i.e., United States), or from a different (i.e., Bulgaria), or very different (i.e., Sierra Leone) national culture. Participants then read an operational scenario involving themselves and the hypothetical teammate. In half of the missions, the teammate was depicted as committing a potential trust violation, with the other half of the missions having no violation. Pre and post-mission questionnaires examined participants' trust and expectations about their teammate and mission success. Teammate behaviour attributions and 'willingness to risk' in a future mission with the teammate were assessed only post-mission.

Findings showed that participants had more initial confidence in their team partner and marginally more trust in their team when their teammate was from a similar culture. Post-mission trust violations had a strong and consistent impact, while the role of cultural identity became less pronounced. Overall, when teammates committed a trust violation they were seen as less trustworthy, and willingness to risk and expectations decreased, and this overrode the initial effects of culture group.

These results suggest that culture can have a prominent impact on initial perceptions and expectations about both the trustworthiness and the performance of new teammates. Possible theoretical accounts of these findings are explored and lessons learned, future research and implications for CF training are addressed. Better understanding category-based trust will be critical as the CF moves toward increasingly dynamic, diverse and distributed operations.

2.7   Organizational Trust Literature Review

This literature review explored research and theory relevant to organizational trust, and the antecedents and consequences of organizational trust, with a specific emphasis on the military context. This review first explores the dimensions that influence trust and the ways in which trust develops, referents of organizational trust, and sociological underpinnings that serve as preconditions for organizational trust. The literature suggests that the dimensions that influence trust and the ways in which trust develops are relatively similar in the organizational and interpersonal domains. However, critical issues distinguishing organizational trust from interpersonal trust include the potential shifting nature of the referent and the sociological underpinnings that serve as preconditions for organizational trust. For instance, trust between two organizations can represent trust in an abstract system as well as trust in a particular person who is a representative of the system (i.e., individuals who represent the organization in interactions with other employees or other organizations such as managers or 'boundary spanners' who are individuals who perform liaison duties or functions between organizations). Furthermore, organizational trust can emerge out of the complex institutional framework that enables the structure and action that occur within and among these organizations.

The factors that influence organizational trust are also explored, such as organizational structure and change, diversity, and culture. In addition, the effects of organizational trust (e.g., job satisfaction, organizational commitment, citizenship behaviours, and performance) are discussed. Finally, as a better understanding of organizational trust in a JIMP context will require considerable work related to further capturing the nuances of trust in military contexts, ideas for a future program of organizational trust research are presented. Specific research issues and questions related to learning more about the factors and the effects of organizational trust are offered.

3 Knowledge Transfer

One of the challenges of defence science is finding appropriate venues for the transfer of knowledge products to the Canadian Forces. We have been fortunate to have been involved in some good collaborative opportunities in this respect within the current research project. These knowledge transfer opportunities are outlined below.

3.1 Canadian Forces Leadership Institute Publications

Stouffer, J. M., Adams, B. A., Sartori, J., & Thompson, M. M. (in preparation). Trust. in The Military Leadership Handbook. CFLI Press and The Dundurn Group Publishers Toronto.

Stouffer, J. M. Trust Handbook. (in preparation). CFLI Press

These works summarize the major literature derived throughout this research project in the areas of trust development, maintenance, violation and repair. This literature is now being incorporated into two products in collaboration with the Canadian Forces Leadership Institute Press. The first is a chapter summarizing trust to appear in the upcoming *The Military Leadership Handbook*, a professional development tool for commanders. A second venue to disseminate the results of this work will be an upcoming *Trust Handbook*, a more in-depth treatment of trust development, maintenance, violation and repair applied to the military context.

3.2 Trust in Teams and Trust in Leaders Scales Publication

The content included in this publication has been summarized in section 2.1.2. The goal of this work is to provide the widest dissemination of the trust scales via their publications in a peer-reviewed journal with a military relevance and audience, for instance Military Psychology. A first draft of the manuscript has been prepared and is expected to be submitted for journal publication in 2008.

To date the trust scales also have been distributed to the membership of The Technical Cooperation Panel (TTCP) Technical Panel 11.

4   Future Research Directions

The next section outlines future research directions for trust research. There are many interesting directions for new research that are associated with the work conducted in the Trust Violation and repair ARP. However, major criteria for the future research directions outlined in this section are that they must be consistent with the research priorities of the Command Thrust within the Land Partner Group and also be consistent with the vision and goals of the Collaborative Performance and Learning Section at DRDC Toronto.

4.1   Research Priorities of the Command Thrust, Partner Group 2

A complete list of the research priorities of the Command Thrust within Partner Group 2 are listed in Annex A[1]. Issues of trust pervade many of these stated research priorities.

For instance, the following priorities are included within the Human Pillar:

- PME for command competencies, including leadership, and especially for adaptive command in dispersed ops (ADO) (*Individual*)

- Principles for establishing trust in teams and leaders, especially distributed teams (*Team*)

- Factors governing use of decentralized vice centralized decision making (*Team*)

- Strategies for formation of cohesive ad hoc teams (*LF Organization*)

- Role of liaison officers (*LF Organization*)

- Collaboration across JIMP, including inter-organization trust (*JIMP*)

- Implications of JIMP for each level of LF command (*JIMP*)

Within the Command Support pillar the following research priorities are also relevant to issues of trust:

- Establishment of well-calibrated trust in technology, especially distributed autonomous systems (*Individual*)

- Management of distributed information enabling shared situational awareness and timely decision making (*Team*)

- Mission command philosophy & implications for decision making, especially mission effectiveness risk and error tolerance (*LF Organization)*

- Collaborative planning support in a JIMP context (*JIMP*)

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[1] At this point in time, there are no research priorities within the Communications and Information Technology Pillar that directly implicate issues of trust.

4.2   Vision and Research Priorities of the Collaborative Performance and Learning Section, DRDC Toronto

The research arc that falls within the purview of DRDC Toronto's Collaborative Performance and Learning (CPL) Section is primarily directed toward two Science and Technology challenge areas(4). The main or core challenge to be addressed by CPL is:

Strategies for Promoting Collaborative Behavior among Teams, Agencies, Organizations and Societies

> Future crises will require the CF to work effectively with various government and non-government agencies. International conflicts will involve joint operations and multinational coalition forces embedded in diverse social and cultural settings. Accordingly, planning and decision-making in future CF operations will involve collaborative work, often in distributed Network Enabled Operations and adhoc teams. The challenge is to understand key psycho-social aspects of collaborative work (e.g., effective leadership and teamwork behaviors, establishing and maintaining shared intent and situational awareness, and fostering a climate of trust) and to develop methods and models to foster collaborative behavior. One of the key elements is the establishment and maintenance of trust within teams, across organizations such as the CF and among organizations such as allies.

A secondary or supporting challenge of CPL is:

Distributed Adaptable, and on-demand learning, training and rehearsal

> Tactical and operational success demands CF capability of timely, affordable, and effective learning. In particular, full operational control of a transformed and integrated CF charged with an expanded variety of missions will require distributed and adaptable training capabilities. The challenge is to advance technologies and psychological techniques for deployable training and rehearsal that facilitates rapid deployment into a Joint Interagency Multinational and Public Environment including interoperability with allies and cultural awareness.

As is clear form the proceeding descriptions, trust is a key social psychological construct identified by the challenges pertaining to CPL. The supporting challenge provides links between basic research knowledge developed and training applications. The knowledge and tools developed within the current Trust Violation and Repair project have many applications to future research concerns. Some of these are outlined below.

4.3   S & T for the Optimized Battle Group (OBG) (12tc)

The objective of this new project within PG2 (12tc) is to provide rigorous and defensible science and technology support to the Optimized Battle Group (OBG) Study within the Land Force's Army of Tomorrow. The OBG is part of the larger Land Forces Army of Tomorrow (AoT) concept design focusing on the adaptive dispersed operations (ADO) concept of networked-enabled operations, and Joint, Interagency, Multinational and Public (JIMP) missions.

More specifically, the OBG is an alternative approach to the current Managed Readiness approach to operations. Designed to enhance certain capabilities and to experiment with novel approaches to conducting operations including the JIMP aspect, the OBG ARP will investigate the benefits of this battle group configuration in comparison to the current 'Managed Readiness' approach to operations.

In order to address the issue of the composition of the OBG, "Directorate Land Concepts and Design will start a multi-year, phased experiment in Gagetown, NB, centred on the 2nd Battalion of the Royal Canadian Regiment" (4). The OBG Study will use the *Trust in Teams* and *Trust in Leaders* scales, developed within 16kx and 12oe, to assess the development and maintenance of trust concerning the integration of non-infantry positions into the infantry battle group.

4.4 JIMP Essentials in the Public Domain - Implications for Education and Training for the Tactical Commander (12og)

The capacity to be "JIMP-capable" is now cited as an important enabler for the Army of Tomorrow operating concept of adaptive dispersed operations, and a key means to ensure mission success in an increasingly complex land environment (4) However, the specifics of what constitutes being 'JIMP-enabled' or 'JIMP-capable' remain to be established. This is particularly the case in terms of effectiveness in the public aspects of JIMP. Thus, the 'JIMP Essentials in the Public Domain' ARP will initially focus on the conceptual clarification of the 'Public' aspects of the JIMP capability, its importance and how this capability may be optimally achieved, focusing on the development of knowledge, education and training for the tactical commander. Identification of individual differences/aptitudes that enable a person to work effectively and succeed in a JIMP environment, with implications for training, selection and teamwork will also form a part of the work conducted in this ARP. These objectives to be realized by the integration of JIMP "lessons learned" and "best practices" based on in-depth analysis of the experiences of Provincial Reconstruction Team (PRT) (military, OGDs, and NGOs) members. It is anticipated that this ARP will, in part, draw upon the literature and findings from the Trust Violation and Repair project in order to understand the psychological factors that promote a JIMP capability. This ARP will also provide a springboard for a future ARP, exploring the issues related to the development and maintenance of interagency trust within a JIMP context (see below).

4.5 Future ARP Proposal on Interagency Trust

The CF is moving toward increasing integration consistent with the tenets of a Joint, Interagency, Multinational and Public concept of operations. While experienced in the Joint and multinational operations, the interagency and public aspects of this approach represent relatively new territory for the CF.

"Trust is a critical factor in alliance formation (5), and is believed to be particularly important for success in complex environments characterized by high ambiguity and uncertainty" (6, p. 153).

Such complexity is surely reflected in the integration of various government agencies that "have separate and unique capabilities, budgets, cultures, operational styles and … oversight committees" (7). The dynamic becomes even more byzantine with the addition of non-governmental organizations. Indeed, getting these various partners "organized on battlefields, after disasters, and during crises can be like herding cats. [Yet] to meet the dangers of the 21st century, interagency operations will be more important than ever" (7). To date however, "it remains unclear how trust is built, maintained and repaired across multiple interacting ... groups such as nations, industries, professions and organizations" … (6).

Thus the goals of this Applied Research Project will be to identify the key dynamics in the development and maintenance of trust in diverse JIMP environments, and to develop training that will promote trust within such mission contexts. This will initially entail the application of the knowledge garnered in the past trust projects with a more complete exploration of the factors that affect Inter-organizational and intercultural trust. It will develop a library of 'lessons-learned' from the point of view of the CF as well as from the perspective of key Canadian governmental and non-governmental partners. The knowledge transfer aspects of this ARP will be focused upon the information, education and training that might improve the JIMP-capability of the CF as it engages in operations with multiple governmental and nongovernmental partners.

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6   Annex A

One Army, One Team, One Vision DGLCD			
	Individual	Team	LF Organization	JIMP
Human	PME for command competencies, including leadership, and esp for adaptive command in dispersed ops (ADO);	Principles for establishing trust in teams and leaders, esp distributed teams; Factors governing use of decentralized vice centralized decision making	Strategies for formation of cohesive ad hoc teams; Role of liaison officers; Human implications of 3-block war; Organizational structures for distributed land forces;	Collaboration across JIMP, including inter-org trust; Policies for POWs, detainees, etc; Implications of JIMP for each level of LF command Cultural analysis to assist commander's intent
Command Support	Establishment of well-calibrated trust in tech, esp distributed autonomous systems; HSI of novel C4ISR technologies; 12oz04	Management of distributed information enabling shared SA and timely decision making; 12of Facilitating distributed briefings and rehearsals; Decentralized Tactical Decision-making Support Enabling C2 on the move;	Mission command philosophy & implications for decision making, esp mission effectiveness risk and error tolerance; Visualization of the FSE; Distributed training with synthetic environments Methods for rapidly incorporating lessons from the field Planning process support considering an effects-based approach; 12od Assessment of effects, both kinetic and non-kinetic;	Mapping the participants in the JIMP network Collaborative planning support in a JIMP context Development of tools to record, integrate and retain culture info
Comms & IT	Miniaturization, including soldier-worn network connectors	Blue-force tracking in complex terrain	Strategies for evolution of LCSS architecture; Robust networked architectures; *12oa; 12oz05*	Architectures for IT multi-level multi-caveat security;

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1 Micheline Belanger Micheline.Belanger@drdc-rddc.gc.ca
1 Shawn Hoag Shawn.Hoag@drdc-rddc.gc.ca

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Abus de confiance et restauration de la confiance : Résumé et rapport définitif du projet (U)

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Megan M. Thompson

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(U) The purpose of the current report is to summarize the work conducted within Project 12oe 'Trust Violation and Repair'. The report begins with a review of the project objectives and provides some background as to the genesis of the work conducted within this project. The major pieces of work undertaken within this project are outlined as are the major findings from each of these milestones. These include a measure validation study completing the development of the Trust in Teams Scale and the Trust in Leaders Scale. Three empirical studies on the nature of trust violation and repair, one investigating the phenomenon of category–based trust (i.e., swift trust), violations and repair in distributed teams, with a further study exploring similar trust dynamics in culturally diverse teams. As well, this project involved the development of trust violation scenarios relevant to a military (infantry) context. Knowledge Transfer aspects of the work conducted within this project, including two publications with the Canadian Forces Leadership Institute and international dissemination of the trust measures are also outlined. I conclude with lessons learned and suggestions for future research within this area.

(U) Le rapport vise à résumer les travaux réalisés dans le cadre du Projet 12oe, Abus de confiance et restauration de la confiance. Il commence par passer en revue les objectifs du projet et donner un aperçu du contexte des travaux réalisés. Les principaux jalons du projet sont présentés, de même que les grandes constatations qui en découlent. Il est question notamment d'une étude de validation des mesures, qui complète l'élaboration de l'échelle de confiance envers les équipes et de l'échelle de confiance envers les chefs. Trois études empiriques portaient sur la nature de l'abus de confiance et de la restauration de la confiance : une d'entre elles a permis d'étudier le phénomène de la confiance fondée sur l'identité (p. ex., la confiance instantanée), une autre, l'abus et la restauration de la confiance au sein d'équipes réparties, et la dernière, la variation de la confiance au sein d'équipes diversifiées au plan culturel. Dans le cadre du projet, on a aussi élaboré des scénarios d'abus de confiance pertinents pour les militaires (infanterie). Le rapport fait état du transfert du savoir découlant des travaux réalisés, notamment de deux documents publiés en collaboration avec l'Institut de leadership des Forces canadiennes et de la diffusion des mesures de confiance à l'échelle internationale. En conclusion, on propose des leçons retenues et des pistes de recherche connexes.

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