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DEVELOPMENT OF COMPREHENSIVE APPROACH TO MILITARY OPERATIONS TRAINING TOOLS

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Abstract

Defence Research and Development Canada, Toronto Research Centre (DRDC TRC) has launched an applied research program (ARP) to develop a training toolkit for Canadian Armed Forces (CAF) personnel operating in the comprehensive approach (CA). This approach "brings together all the elements of power and other agencies needed to create enduring solutions to a campaign," including joint and multinational military forces, other governmental departments (OGDs), non-governmental organizations (NGOs), and international organizations (IOs) (Canadian Forces Joint Publication – CFJP 3.0, 2011, p. GL-3). Research has indicated that operating in a CA environment may present challenges for CAF personnel (Thomson, Adams, Hall, & Flear, 2010) and, therefore, it demands specific training (Filardo, Thomson, Harkness, & Adams, 2013). Military subject matter experts (SMEs) identified communication, relationship building, and negotiation skills as competencies necessary for the CA because of the civil-military component, but they said there was little CAF training to develop these competencies with respect to interactions with civilians from interagencies and NGOs (Filardo et al., 2013). In support of the DRDC, Toronto Research Centre ARP, this project had two objectives: 1) to examine data collected from earlier research on civil-military collaboration (Thomson et al., 2010; Thomson, Adams, Hall, Brown, & Flear, 2011a; Thomson, Adams, Hall, Brown, & Flear, 2011b; Filardo et al., 2013) and identify critical incidents pertaining to communication, relationship building, and negotiation skills for future scenario development; and 2) review the literature on scenario development and application. To this end, a detailed coding scheme was developed for each competency of interest. In total, 776 passages were coded as potential sources for scenario development. The literature identified three ways that scenarios could be used for CAF CA training, including scenario-based learning (SBL), situational judgement tests (SJT), and case studies. Using the coded data, an example for each scenario methodology was created to demonstrate how scenarios could be used to train CAF personnel for the CA.

Résume

Le Centre de recherche de Toronto (CRT) de Recherche et développement pour la défense Canada (RDDC) a lancé un programme de recherche appliquée visant à mettre au point une boîte à outils didactique à l'intention du personnel des Forces armées canadiennes (FAC) opérant dans le cadre de l'approche exhaustive. Cette approche « réunit tous les éléments du pouvoir et les autres organismes requis pour créer des solutions durables à une campagne », y compris des forces militaires interarmées et multinationales, d'autres ministères, des organisations non gouvernementales (ONG) et des organisations internationales [Publication interarmées des Forces canadiennes(PIFC) 3.0, 2011, p. GL-3]. Des études indiquent qu'opérer dans le cadre d'une approche exhaustive peut présenter des défis au personnel des FAC (Thomson, Adams, Hall et Flear, 2010), et cela exige par conséquent une formation particulière (Filardo, Thomson, Harkness et Adams, 2013). Des experts en la matière (EM) militaires ont indiqué que des aptitudes à communiquer, à établir des relations et à négocier sont des compétences nécessaires dans le cadre de l'approche exhaustive en raison de la composante civilo-militaire et ont précisé que les FAC avaient peu de cours permettant de développer ces aptitudes pour ce qui est des relations avec les civils d'interinstitutions et d'ONG (Filardo et coll., 2013). À l'appui du programme de recherche appliquée du Centre de recherche de Toronto de RDDC, le présent projet comporte deux objectifs : 1) examiner les données recueillies dans le cadre d'études antérieures sur la collaboration civilo-militaire (Thomson et coll., 2010; Thomson, Adams, Hall, Brown et Flear, 2011a; Thomson, Adams, Hall, Brown et Flear, 2011b; Filardo et coll., 2013) et cerner les incidents critiques liés aux aptitudes à communiquer, à établir des relations et à négocier en vue d'élaborer des scénarios; et 2) procéder à une revue de la littérature sur l'élaboration de scénarios et leur application. À cette fin, un schéma de codage détaillé a été conçu pour chaque aptitude visée. En tout, 776 passages ont été codés comme sources possibles pour l'élaboration de scénarios. La revue de la littérature a permis de déterminer trois façons d'utiliser les scénarios pour la formation sur l'approche exhaustive des FAC : les mises en situation, les tests de jugement situationnels et les études de cas. À l'aide des données codées, un exemple a été créé pour chaque méthode afin de montrer comment chaque scénario peut être utilisé pour former le personnel des FAC en ce qui a trait à l'approche exhaustive.

Executive Summary

Development of Comprehensive Approach to Military Operations Training Tools

M. Thomson, A. Brown, S. Davis, E-A. Filardo and B. Adams, Human*Systems*® Incorporated; DRDC Toronto CR2013-136; Defense Research and Development Canada Toronto Research Centre; September 2013.

Defence Research and Development Canada, Toronto Research Centre (DRDC, TRC) has launched an applied research program (ARP) to develop a training toolkit for Canadian Armed Forces (CAF) personnel operating in the comprehensive approach (CA). This approach "brings together all the elements of power and other agencies needed to create enduring solutions to a campaign" (Canadian Armed Forces Joint Publication – CAFJP 3.0, 2011, p. GL-3), including joint and multinational military forces, other governmental departments (OGDs), non-governmental organizations (NGOs), and international organizations (IOs). Research has indicated that operating in a CA environment may present challenges for CAF personnel (Thomson, Adams, Hall, & Flear, 2010) and, therefore, it demands specific training (Filardo, Thomson, Harkness, & Adams, 2013). Military subject-matter experts (SMEs) identified communication, relationship building, and negotiation skills as competencies necessary for the CA because of the civil-military component, but they said there was little CAF training to develop these competencies with respect to interactions with civilians from interagencies and NGOs (Filardo et al., 2013). In an effort to support future CA training, this project sought to 1) examine data collected from earlier research on civil-military collaboration (Thomson et al., 2010; Thomson, Adams, Hall, Brown, & Flear, 2011a; Thomson, Adams, Hall, Brown, & Flear, 2011b; Filardo et al., 2013) and identify critical incidents pertaining to communication, relationship building, and negotiation skills for future scenario development; and 2) review the literature relating to scenario development and application.

The data from 71 SME interviews was reviewed and coded to identify passages that could potentially be used in scenario development. A coding scheme was developed for each competency of interest (i.e., negotiation, communication, relationship building), based largely on previous research (Thomson, Adams, Filardo, Flear, & DeWit, 2013; Thomson et al., 2011a; Thomson et al., 2011b; Thomson et al., 2010; Thomson & Adams, 2006). For each competency, a number of core activities (e.g., building trust, creating an effective atmosphere, etc.) and their relative optimal and suboptimal characteristics (e.g., transparency, secrecy; establishing common ground, polarizing identities, etc.) were also identified. NVivo9 qualitative software was used for qualitative data analysis. In total, 776 quotes were identified as possible sources for scenario development. There was a relatively equal distribution of coded optimal and suboptimal passages for each core activity.

A short review of the literature pertaining to scenario development and application was conducted. Three methods were identified as possible ways to introduce scenarios into the CA training toolkit: scenario-based learning (SBL), situational judgement tests (SJTs), and case studies. SBL is used to coach particular skills (skills-based), to instruct trainees about problem-solving under uncertainty and ambiguity (problem-based), to provide a broad understanding about relevant issues (issue-based), or to consider some future event (speculative-based) (Errington, 2011). SBL involves role-playing in a context-rich environment with fellow trainees and encourages trainees to adopt a work-based identity

as they act out activities typical of their profession (Errington, 2011). Trainees receive immediate feedback from instructors.

For the SJT, trainees are presented with typical scenarios associated with their profession, and they are typically asked to rate a number of predetermined responses using a Likert-type scale (McDaniel & Nguyen, 2001). SJTs can be used to measure job performance as well as to select appropriate candidates for a particular job posting (O'Connell, Hartman, McDaniel, Grubb, & Lawrence, 2007, as cited in Durlach, Wansbury, & Wilkinson, 2008). Research has shown that SJTs are useful for comparing an individual's pattern of judgement to a normative pattern of desirable group or training objectives as well as reliably measuring relevant knowledge (Durlach et al., 2008).

Case studies are pedagogical devices used to assess trainees' abilities to synthesize, evaluate, and apply theoretical class material to a situation ("Teaching," 1994). Typically, cases are based on past events or experiences. It is suggested that adding detailed information surrounding the main actors involved (e.g., thoughts and feelings, conversations, etc.) in order to engage the trainees and prompt them to consider those who lived through the situation will increase realism (Krain, 2010). Case studies are discussed among fellow trainees, and instructors help facilitate discussion by using prompts and focused questions.

For each scenario methodology, an example was created using the coded data. The coded data gathered from this project indicate that there are a multitude of scenario examples that could be used in the CA training toolkit. When creating scenario examples across the three scenario methods, common issues or themes emerged from the data, allowing for the creation of specific scenarios in the core area of relationship building and communication. It is suggested that the application of SBL, SJTs, and case studies could be used for developing scenarios to fit the objectives of the training toolkit for a comprehensive context.

Sommaire

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M. Thomson, A. Brown, S. Davis, E-A. Filardo and B. Adams, Human*Systems*® Incorporated; RDDC Toronto CR2013-136; Recherche et développement pour la défense Canada; Centre de recherches de Toronto; Septembre 2013.

Le Centre de recherche de Toronto (CRT) de Recherche et développement pour la défense Canada (RDDC) a lancé un programme de recherche appliquée visant à mettre au point une boîte à outils didactique à l'intention du personnel des Forces armées canadiennes (FAC) opérant dans le cadre de l'approche exhaustive. Cette approche « réunit tous les éléments du pouvoir et les autres organismes requis pour créer des solutions durables à une campagne » [Publication interarmées des Forces canadiennes(PIFC) 3.0, 2011, p. GL-3], y compris des forces militaires interarmées et multinationales, d'autres ministères, des organisations non gouvernementales (ONG) et des organisations internationales. Des études indiquent qu'opérer dans le cadre d'une approche exhaustive peut présenter des défis au personnel des FAC (Thomson, Adams, Hall et Flear, 2010), et cela exige par conséquent une formation particulière (Filardo, Thomson, Harkness et Adams, 2013). Des experts en la matière (EM) militaires ont indiqué que des aptitudes à communiquer, à établir des relations et à négocier sont des compétences nécessaires dans le cadre de l'approche exhaustive en raison de la composante civilo-militaire et ont précisé que les FAC avaient peu de cours permettant de développer ces aptitudes pour ce qui est des relations avec les civils d'interinstitutions et d'ONG (Filardo et coll., 2013). En vue de soutenir la formation future des FAC quant à l'approche exhaustive, le présent projet vise 1) à examiner les données recueillies dans le cadre d'études antérieures sur la collaboration civilo-militaire (Thomson et coll., 2010; Thomson, Adams, Hall, Brown et Flear, 2011a; Thomson, Adams, Hall, Brown et Flear, 2011b; Filardo et coll., 2013) et à cerner les incidents critiques liés aux aptitudes à communiquer, à établir des relations et à négocier en vue d'élaborer des scénarios; et 2) à procéder à une revue de la littérature sur l'élaboration de scénarios et leur application.

Les données recueillies lors d'entrevues avec 71 experts en la matière ont été examinées et codées afin de cerner les passages susceptibles d'être utilisés pour l'élaboration de scénarios. Un schéma de codage a été conçu pour chaque aptitude visée (c.-à-d. négocier, communiquer, établir des relations), en se basant principalement sur des études passées (Thomson, Adams, Filardo, Flear et DeWit, 2013; Thomson et coll., 2011a; Thomson et coll., 2011b; Thomson et coll., 2010; Thomson et Adams, 2006). Pour chaque aptitude, un certain nombre d'activités de base (p. ex., bâtir la confiance, créer une atmosphère propice, etc.) et leurs caractéristiques optimales et sous-optimales connexes (p. ex., la transparence, le secret; l'établissement d'un terrain d'entente, polarisation des identités, etc.) ont également été définies. Le logiciel NVivo9 a été utilisé pour l'analyse des données qualitatives. En tout, 776 citations ont été cernées comme sources possibles pour l'élaboration de scénarios. Les passages codés optimaux et sous-optimaux étaient réparties de façon relativement égale entre chaque activité de base.

Une courte revue de la littérature sur l'élaboration de scénarios et leur application a été effectuée. Trois méthodes permettant d'inclure des scénarios dans la boîte à outils didactique sur l'approche

exhaustive ont été cernées : les mises en situation, les tests de jugement situationnels et les études de cas. Les mises en situation sont utilisées pour offrir un encadrement quant à des aptitudes particulières (axées sur les aptitudes), pour former des stagiaires sur la résolution de problèmes en situation d'incertitude et d'ambiguïté (axées sur les problèmes), pour permettre une large compréhension des questions pertinentes (axées sur les questions) ou pour tenir compte de circonstances futures (axés sur des hypothèses) [Errington, 2011]. Les mises en situation sont des jeux de rôle auxquels prennent part d'autres stagiaires dans un contexte riche et encouragent les participants à adopter une identité axée sur le travail en effectuant les activités caractéristiques de leur profession (Errington, 2011). Les stagiaires reçoivent une rétroaction immédiate des instructeurs.

Dans le cadre des tests de jugement situationnels, on présente aux stagiaires des scénarios propres à leur profession et on leur demande généralement d'évaluer un certain nombre de réponses prédéterminées en fonction d'une échelle de type Likert (McDaniel et Nguyen, 2001). Les tests de jugement situationnels peuvent servir à mesurer le rendement au travail et à choisir des candidats appropriés pour une affectation professionnelle particulière (O'Connell, Hartman, McDaniel, Grubb et Lawrence, 2007, cité dans Durlach, Wansbury et Wilkinson, 2008). La recherche a révélé que les tests de jugement situationnels sont utiles pour comparer la façon de juger d'une personne en fonction d'un modèle normatif de groupe cible ou d'objectifs de formation et pour mesurer de façon fiable les connaissances pertinentes (Durlach et coll., 2008).

Les études de cas sont des outils pédagogiques utilisés pour évaluer la capacité de synthèse et d'évaluation des stagiaires ainsi que leur aptitude à appliquer les connaissances théoriques à une situation (Teaching, 1994). Généralement, les cas sont basés sur des situations ou des expériences passées. L'ajout de renseignements détaillés au sujet des principaux acteurs concernés (p. ex. pensées et sentiments, conversations, etc.) afin de susciter l'intérêt des stagiaires et de les inciter à songer aux personnes qui ont vécu la situation augmenterait le réalisme (Krain, 2010). Les stagiaires discutent entre eux des cas étudiés, et les instructeurs favorisent les échanges en posant des questions incitatives et des questions ciblées.

Pour chaque méthode, un exemple a été créé à l'aide des données codées. Les données codées recueillies dans le cadre du présent projet montrent qu'il y a une multitude d'exemples de scénario qui peuvent être utilisés dans la boîte à outils didactique sur l'approche exhaustive. En créant des exemples de scénario pour les trois méthodes, des questions et des thèmes communs se sont dégagés des données, ce qui a permis la création de scénarios précis dans le domaine clé de l'établissement de relations et de la communication. Les mises en situation, les tests de jugement situationnels et les études de cas pourraient être utilisés pour élaborer des scénarios qui correspondent aux objectifs de la boîte d'outils didactique relative à un contexte global.

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1. Introduction

Today's military engagements often come with a growing imperative to enable post-conflict reconstruction and stabilization. Known as the comprehensive approach (CA) to operations (Leslie, Gizewski, & Rostek, 2008), international intervention increasingly seeks to combine military and civilian assets in a coordinated manner to achieve the desired outcomes (e.g., state stability and prosperity). As stated in the Canadian Forces Joint Publication – CFJP 3.0 (2011, p. GL-3), "[t]he Comprehensive Approach brings together all the elements of power and other agencies needed to create enduring solutions to a campaign," which "may include: military (joint and multinational forces), Canadian government departments and agencies (whole of government), foreign governments and international organizations (e.g. NATO and UN) and publicly funded organizations (e.g. NGOs)." The most recent operation in Afghanistan is a good example of this approach; it required combat activities as well as stabilization, reconstruction and nation-building activities, demanding a configuration of expertise from other governmental departments (e.g., the Canadian International Development Agency), international organizations, non-governmental organizations (e.g., the International Committee of the Red Cross), and the military. As a consequence, the Afghanistan mission demanded increased civil-military interaction and collaboration as mission objectives hinged on the input of all parties.

However, research shows that civil-military interaction and collaboration in operations can be wrought with challenges. For example, Winslow (2002) identified a number of organizational variables that may hinder civil-military collaboration, such as different structures and cultures, ways of approaching and accomplishing tasks, definitions of success and time frames, and approaches to information sharing. A number of research initiatives by Thomson and colleagues (2011a) suggest that these organizational differences have impacted civil-military collaboration. For example, the very small size of civilian representation in the Afghanistan theatre compared to the CAF made it difficult for civilians to fully integrate at times, and in some cases, this lack of integration presented challenges with planning and decision-making exercises (Thomson, Adams, Hall, Brown, & Flear, 2011a). Moreover, civilians who had operated in theatre said that the CAF did not fully comprehend the length of time and effort that goes into development projects, and that this lack of understanding was worsened by the CAF's relatively quick rotations and desire for immediate results (Thomson et al., 2011a). On the other hand, CAF personnel thought that the civilian organizations in Afghanistan were constrained by their command structure in Ottawa, making them less responsive in the field (Thomson et al., 2011a).

At the interpersonal level, it was reported that the military sometimes overstepped its jurisdiction, that the military was "*trespassing on development*" and should rather consult the development experts (Thomson, Adams, Hall, Brown, & Flear, 2011b). Indeed, CAF personnel were accused of taking charge of the situation, irrespective of their counterparts' expertise and experience and topic of discussion (Thomson et al., 2011b). Respecting civilian counterparts in operations is a key theme that has emerged as a barrier to civil-military collaboration (Thomson et al., 2011b; Thomson, Adams, Hall, & Flear, 2010). Indeed, achieving mutually beneficial outcomes from collaborating requires that counterparts listen to the concerns and interests of one another in order to locate compatible interests and generate mutually satisfactory solutions (Fisher, Ury, & Patton, 1991). Integrated or "win-win" negotiated outcomes demand the input of all parties (Thompson, Wang, & Gunia, 2010). Research has shown that open dialogue and engagement between civil and military actors in theatre could

advance the concerns and interests of all parties and promote more effective collaboration initiatives (Thomson et al., 2011b).

Despite the challenges that may arise in civil-military collaboration in operations, there have also been cases where collaboration has worked. For example, building relationships with one's counterpart has included establishing common ground, hosting inclusive events, actively listening to others' concerns and interests, and "*mak*[ing] *nice*" (Thomson et al., 2011b). The CAF leadership has also been described as effective at reaching out to and engaging with its civilian counterparts, especially in comparison to other coalition militaries (Thomson et al., 2011b). Moreover, co-locating civilian counterparts in theatre, explaining organizational structures and systems, and demonstrating one's capability, have all led to more effective collaboration (Thomson et al., 2011a). Recognizing that civilians needed to be involved in campaign planning and integrating them in this process has led to more effective civil-military collaboration (Thomson et al., 2011a). It is important to ensure that the right CAF personnel are selected and trained to operate in the comprehensive environment, especially for those who will be tasked to civil-military collaboration efforts. Research has shown that building strong relationships may be essential to enhance collaboration (Thomson et al., 2011b; Filardo, Thomson, Harkness, & Adams, 2013). Moreover, strong relationships are also critical to successful negotiations (Halpert, Stuhlmacher, Crenshaw, Litcher, & Bortel, 2010). In fact, enduring relationships have been shown to be a stronger predictor of the willingness to participate in future negotiations than instrumental outcomes, such as an organization's concrete goals or objectives (Curhan, Elfenbein, & Xu, 2006). At the same time, the ability to collaborate with civilians requires attention to developing and continually promoting a culture of collaboration (Thomson et al., 2011b). Organizations that espouse the values of participation, fairness, freedom of expression and interdependence (Evans, 1994, Henneman et al., 1995; as cited in San Martin-Rodriguez, Beaulieu, D'Amour, & Ferrada-Videla, 2005), and promote a climate of openness, integrity and trust (Stichler, 1995; as cited in San Martin-Rodriguez et al., 2005), will likely produce the appropriate attitudes and values for successful collaboration. Thus, ensuring that these values disseminate across the CAF as an organization may help foster a positive attitude toward civil-military collaboration.

Defence Research and Development Canada, Toronto Research Centre (DRDC, TRC) has launched an applied research program (ARP) to develop a training toolkit for CA. The first phase of the research included a review of the existing CA tools currently used by the CAF, our allies (e.g., Britain, United States), and industry; key informant interviews; and a detailed needs assessment of the Army user community for present and anticipated needs related to CA. The needs assessment was primarily based on results from the key informant interviews and involved two focus groups with two different CAF cohorts (one was more closely affiliated with headquarters while the other was more closely affiliated with Army units). Results showed that no one existing tool fulfilled identified CA training (Filardo et al., 2013). Moreover, research participants indicated that tools need to reflect the current CAF resource constraints, such as time and money, and should target specific learning outcomes (e.g., knowledge of counterpart, skill development, etc.). Asked specifically what competencies needed to be developed for CAF personnel to operate effectively in the CA, the majority of participants' ranked communication and interpersonal/relationship building in the top three (Filardo et al., 2013).

Based on the results from the first phase of the ARP, and in particular the training needs analysis, the current project supports the creation of scenario training approaches that specifically target communication, relationship building, and negotiation skill development for effective civil-military collaboration in a CA to operations. To this end, a short review of the literature pertaining to scenario development and application was conducted. Where possible, this review detailed the context most

appropriate for the scenario type and methodology as well as identified the most appropriate approach to facilitate knowledge and skills development. Secondly, data previously collected by Thomson and colleagues (Thomson et al., 2010, 2011a, 2011b) and Filardo et al. (2013) were reviewed and coded to identify portions of the interviews that could potentially be used in scenario development. Coding specifically focused on communication, relationship building, and negotiation examples. Finally, a list of acronyms used in discussions with SMEs (Thomson et al., 2010, 2011a, 2011b; Filardo et al., 2013) was assembled.

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2. Methods

2.1 Literature Review

As a starting point for meeting the research requirements, a keyword list was generated to identify articles pertaining to scenario development and methodology. This process involved considering the most appropriate terms to include as primary keywords in the search (see Table 1).

Table 1: Keywords

Core Concept	Primary Keywords
Scenario	scenario; scenario development; developing scenarios; scenario methodology; scenario based learning; scenario types; types of scenario; scenario training; scenario typology; case studies; teaching case studies; learning case studies; situational judgement test

The primary keywords were then used to search various databases, including PsychINFO, Google Scholar, and DTIC (Defense Technical Information Center). The search provided a number of different papers related to scenario development and use. We chose articles (approximately N=10) that were useful for the purposes of facilitating skills development for comprehensive approach training in a military context. Articles that focused on the use of scenarios for economic forecasting were deemed not to be relevant for the purposes of this project and were thus excluded from further consideration.

2.2 Qualitative Data Analysis

2.2.1 Data

To complement the literature review, we reviewed the data collected from four previous task authorizations for DRDC Toronto (Thomson et al., 2010, 2011a, 2011b; Filardo et al., 2013). For these tasks, subject-matter experts (SMEs) shared their personal experiences working in a comprehensive approach to operations environment (also referred to as JIMP environment – Joint, Interagency, Multinational, and Public). Participants spoke of their experiences of collaborating with a number of different actors in a range of theatres of operation (including Afghanistan, Haiti, Bosnia, Sudan). As Table 2 shows, participants were affiliated with a broad range of organizations. In fact, of the 24% of participants who worked for NGOs, only a few were affiliated with the same organization.

Table 2: Participant affiliation

Category	Number	Percentage
Canadian Armed Forces (CAF)	25	35%
Other Governmental Departments (OGDs)	21	29%
Non-Governmental Organizations (NGOs)	17	24%
International Organizations (IOs)	4	6%
Media	2	3%
Public (host nation population)	2	3%
Total	71	100%

In reviewing the data, our goal was to identify particular examples of communication, relationship building, or negotiation that could potentially be used in future scenario development for CA training purposes. To do this, we developed a coding scheme that reflected the characteristics associated with the three competencies of interest.

2.2.2 Coding Scheme

A coding scheme for each competency of interest – communication, relationship building, and negotiation – was created by the research team and was based largely on previous research (Thomson, Adams, Filardo, Flear, & DeWit, 2013; Thomson et al., 2011a; Thomson et al., 2011b; Thomson et al., 2010; Thomson & Adams, 2006). For each competency, a number of activities and their relevant characteristic manifestations were identified. Characteristics had both optimal and suboptimal correlates. For example, when one communicates, his or her expression can be clear and concise (optimal) or unclear and inconcise (suboptimal). Communication also requires sensitivity to one's counterpart, which is manifest in, for example, listening and eliciting input.

Similarly, when considering building a relationship, core activities include creating an effective atmosphere, showing appreciation for one's counterpart, building trust, and socializing. These activities have particular characteristics associated with them. One shows appreciation for one's counterpart by being respectful, empathic, and recognizing his or her contribution. Of course a lack of appreciation includes insensitivity to the concerns and interests of one's counterpart, acting disrespectfully, and showing a lack of gratitude for his or her contribution.

For each optimal and suboptimal characteristic, a description was generated, so that coding could address the nuances and detail of the SME responses and act as a guide for the analyst. As the research team worked through the coding, these descriptions were further developed to include other possible examples. For instance, establishing a common ground was originally described as finding something in common with one's counterpart (e.g., "My dad is a farmer too."). However, it soon became apparent while coding that SMEs spoke of sharing an education, experiences, risks, perspective, training, and goals, and these were all seen as a means to establish a common ground with their counterpart, broadly speaking.

The following three tables detail the coding schemes for communication, relationship building, and negotiation that were used for data analysis. The acronym CP in the tables refers to counterpart.

Table 3: Coding scheme for communication

Activity	Optimal		Suboptimal	
	Characteristic	Description	Characteristic	Description
Expressivity	Clear	Using words that both parties understand	Unclear	Use of acronyms particular to industry
	Direct/concise	To the point; directive statements	Indirect/ Inconcise	Compound discussion; unable to determine priorities
Sensitivity	Elicit input from CP	Ask questions	'one-upping'	Providing examples that devalue the other's experience
	Listen to CP	Focus on CP's interests; feedback statements	Interrupting	Not allowing CP to express their full thoughts/views
	Summarize yours & CP's points	Ask if CP has understood; summarize what they've said	Assumption of understanding	Assuming you've understood your CP or that they have understood you
Control	Open & honest	Free info exchange	Closed	Withholding info; classifying info
	Turn-taking	Give opportunity for CP to discuss their concerns	Dominating conversation	Providing no opportunity for one's CP to speak

*Note: use of foul language and sarcasm also classified as suboptimal, but unlikely to be evident in interviews

Table 4: Coding scheme for relationship building

Activity	Optimal		Suboptimal	
	Characteristic	Description	Characteristic	Description
Creating an effective atmosphere	Respecting boundaries	Respecting that CP has a job to do	Taking control of situation	Automatically jumping to the authority position; assertive
	Establishing common ground	Finding something in common with CP; same overarching goals/mandate	Polarizing identities	Creating an 'us' vs 'them' environment; not a team player; excluding CP; resentment toward CP
	Validating CP's position	Providing support for CP's beliefs, opinions, presence, work	Undermining CP's position	Point out reasons that CP's beliefs, presence, work are/is invalid
	Availability/ accessibility	Making time for CP (professionally)	Inaccessible	Making no time for CP, thus creating message that they are not a priority
	Neutral space	Willing to meet in a neutral location; working environment, tasks	Establishing dominant space	Meeting only in one's own space; working environment, tasks
Building trust	Transparency	Being up front about priorities/intentions/info	Secrecy	Not being up front about goals/priorities/info; not inviting CP to meetings
	Credibility	Showing your reliability, competence	Non-credibility	Showing oneself to be unreliable; taking advantage of CP
Socializing	Friendly	Outgoing, willing to talk/ socialize with CP	Avoidant	Shyness, unwillingness to interact with CP socially

Activity	Optimal		Suboptimal	
	Characteristic	Description	Characteristic	Description
Appreciation	Empathetic	Showing sensitivity to CP's feelings	Insensitivity	Ignoring CP's feelings
	Avoiding fundamental attribution error	Acknowledging that a situation, not CP, may be to blame for difficult/ undesirable outcomes	Fundamental attribution error	Assuming difficulties are a result of something inherent about the CP
	Non-judgmental	Accepting opinions without qualification	Stereotyping	Pre-judgments about CP's personality, beliefs, or capabilities
	Appreciating contribution	Acknowledging when other has provided something or contributing something they did not need to contribute	Lack of gratitude	Feelings of entitlement
	Respect	Regard for CP, their expertise, wishes, opinions, etc.; agree to disagree	Disrespect	Showing no regard for CP, their expertise, wishes, beliefs, etc.

Table 5: Coding scheme for negotiation

Activity	Optimal		Suboptimal	
	Characteristic	Description	Characteristic	Description
Negotiation	Cooperative	Willingness to hear CP's concerns, interests, goals, etc. to achieve mutual benefits	Competitive	Sees interests as scarce; views alternatives suspiciously; unwilling to listen to CP
	Building an understanding of CP's interests	Includes various concerns, goals, hopes, fears that are held in relation to negotiation	Assertive	Taking charge of the situation
	Preparation	Understanding one's position including areas where one is willing to compromise	Threatening/ anger expression	Making ultimatums; strategic expressions to convey anger
	Identifying shared areas of interest	Satisfying interests of all parties, convergence	Maintains one's own position	Seeks solution that benefits oneself without considering other's interests, etc.
	Seeking long-term benefits	Shared mission objectives	Seeking short-term gains	No long term vision to negotiation

2.2.3 Coding in NVivo

Each transcription was individually analysed using a qualitative software programme called NVivo9[1]. A member of the research team read the transcripts and coded the occurrence of each communication, relationship building, or negotiation reference at the characteristic level according to the coding scheme, including optimal and suboptimal instances. NVivo9 allows for the organization and classification of optimal and suboptimal instances, according to the corresponding theme in the coding scheme. The codes reflect the participant's description of an event that he or she experienced in operations, which, according to the researcher, matched a behaviour highlighted in the coding scheme. NVivo9 is able to combine all the occurrences of a particular theme for further analysis. For example, all of the interview portions relating to building trust – transparency were available to be viewed together. Moreover, participant numbers were attached to each interview excerpt to allow for the classification of the organization against the participant list (e.g., NGO, IO, CAF, etc.). This enabled the analyst to pinpoint which organizations discussed building trust – transparency. It also allowed for the calculation of frequency counts.

Because more than one member of the research team was involved in coding, it was necessary to ensure that they were calibrated with one another. An inter-rater reliability test was conducted using three coded interviews. The reliability coefficients kappa averaged .69 (individual values were .65, .66, and .77), which falls within the "substantial" category for coding open-ended data (Hruschka, Schwartz, Cobb St. John, Picone-Decaro, Jenkins, & Carey, 2004). Once all of the coding was complete, the lead researcher reviewed the coded examples as a final quality assurance test, locating any coded examples that could be coded differently and adjusted the final coding data base accordingly.

[1] More information regarding NVivo can be found at http://www.qsrinternational.com/products_nvivo.aspx.

2.3 Compiling Acronyms

While members of the research team reviewed and coded the transcriptions, they simultaneously compiled a list of acronyms that were used by SMEs. Acronyms were recorded in an Excel file.

3. Coded SME Data

3.1 Frequencies

The total number of coded data, across all three competencies of interest (i.e., relationship building, communication, and negotiation) was 776[2]. The breakdown of the frequencies is found in the tables below.

Table 6: Communication Codes

Communication					
Optimal		**Count**	**Suboptimal**		**Count**
Expressivity	Clear	6	**Lack of expressivity**	Unclear	3
	Direct/concise	4		Indirect/inconcise	8
	General expressivity	1		General lack of expressivity	1
Total expressivity		11	Total lack of expressivity		12
Sensitivity	Elicit input from counterpart	1	**Insensitivity**	"One-Upping"	0
	Listen to counterpart	1		Interrupting	0
	Summarize yours and counterpart's points	0		Assumption of understanding	1
	General sensitivity	0		General insensitivity	0
Total Sensitivity		2	Total insensitivity		1
Control	Open and honest	10	**Controlling**	Closed	17
	Turn-taking	0		Dominating conversation	0
	General control	0		General controlling	2
Total control		10	Total controlling		19
General communication		0	**General lack of communication**		3
TOTAL COMMUNICATION CODES					58

[2] It should be highlighted that the frequency count represents the total number of coded activities or characteristics. If a participant raised the same issue (e.g., polarizing identities) more than once in his or her interview, each instance was counted separately. Therefore, 10 examples of open and honest communication could mean that only 6 participants raised the issue, but some raised it more than once. Each time it was raised was counted as an instance. Consideration should be given to eliminate the repeated counts (e.g., a participant discussing open and honest four times gets represented as only one time) in order to get a true indication of the percentage of participants who raised a given issue.

Table 7: Relationship Building Codes

Relationship Building					
Optimal		**Count**	**Suboptimal**		**Count**
Appreciation	Empathetic	0	**Lack of appreciation**	Insensitivity	6
	Avoiding Fundamental Attribution Error	5		Fundamental Attribution Error	4
	Non-judgemental	5		Stereotyping	20
	Appreciating contribution	17		Lack of gratitude	6
	Respect	52		Disrespect	40
	General appreciation	2		General lack of appreciation	3
Total appreciation		81	Total lack of appreciation		79
Creating an effective atmosphere	Establishing common ground	59	**Creating an ineffective atmosphere**	Polarizing identities	60
	Validating counterpart's position	20		Undermining counterpart's position	9
	Availability/ accessibility	43		Inaccessible	28
	Neutral space	2		Establishing dominant space	10
	Respecting boundaries	26		Taking control of the situation	30
	General creating an effective atmosphere	33		General creating an ineffective atmosphere	35
Total creating an effective atmosphere		183	Total creating an ineffective atmosphere		172
Building trust	Transparency	24	**Eroding trust**	Secrecy	25
	Credibility	22		Non-credibility	22
	General building trust	6		General eroding trust	3
Total building trust		52	Total eroding trust		50
Socializing	Friendly/extraverted	33	**Not socializing**	Avoidant	8
	General socializing	5		General not socializing	3
Total socializing		38	Total not socializing		11
General relationship building		0	**General lack of relationship building**		4
TOTAL RELATIONSHIP BUILDING CODES					670

Table 8: Negotiation Codes

Negotiation					
Optimal		**Count**	**Suboptimal**		**Count**
Negotiation	Cooperative	13	**Non-negotiation**	Competitive	12
	Building understanding of counterpart's interests	2		Assertive	6
	Preparation	2		Threatening/anger expression	2
	Identifying shared areas of interest	2		Maintain one's own position	4
	Seeking long-term benefits	2		Seeking short-term gains	0
	General negotiation	1		General non-negotiation	2
Total negotiation		22	Total non-negotiation		26
TOTAL NEGOTIATION CODES					48

3.2 Coding Challenges

3.2.1 Double Coding

One limitation that arose when coding was choosing the most appropriate category when the data could be coded under more than one category. Differentiating between communication, relationship building and negotiation proved challenging at times, because each category shares elements with one another. To avoid double coding, we developed decision rules. For example, if the situation was specific to difficulty communicating in a given instance, with examples of dialogue and gestures, then the data would be coded as suboptimal communication. However, if the situation was about how relationships were affected by difficulties communicating, in general accross multiple instances, then the data was coded as suboptimal relationship building. This differentiation proved to be helpful, as there were many examples of data relevant to both communication and relationship building codes simultaneously. The same technique was used when negotiation codes overlapped with relationship building or communication. For a specific instance of negotiation, it was coded as such. Otherwise, the data was coded as relationship building or communication.

Another general guideline followed was to code any piece of data that related to any of the three core competencies under examination (i.e. relationship building, communication, and negotiation), regardless of whether or not it specifically represented a scenario. The researchers deemed it more important to capture content than risk not capturing enough as reviewing and coding proved to involve a high level of effort. This method was also helpful later in the scenario development phase, when multiple pieces of coded data were combined into one scenario.

3.2.2 NVivo9 File Corruption and Repair

Another challenge arose when coding data in NVivo 9. Upon logging into NVivo9, one of the researchers kept having to make several attempts to open the data file before the file would successfully open. Another researcher found that the automatic save function was not actually saving the file to its stored location and, upon closing down the program, lost some coding. The data was coded again as a result. When QSR (the software company that owns NVivo9) technical support was contacted, they

claimed that the file must have become corrupt, and suggested that corruption could be due to a number of reasons (e.g., the project file is on a network drive to which the network connection becomes unavailable for some unknown reason; the computer is shutdown abruptly or goes into sleep mode while NVivo is still running; spyware or malware is installed on the computer where the file is stored; the project is not saved in a Windows folder when working on a Mac).

After some investigation, we concluded that remotely accessing NVivo (i.e., accessing and using the applications and data on another computer over a shared network) was the likely cause of the corruption. Our investigations also revealed that there are other issues that commonly arise on the software. For example, forums online suggested that closing down the program by the "x" in the top right-hand corner is not as safe as closing down by clicking "File" then "Close," and may cause corruption. Upon learning this, we stopped accessing NVivo remotely and worked only on the computer where NVivo was originally installed. We also took extra precautions not to close down the file in any manner other than the one specified above.

Despite overcoming the challenges that arose due to the corrupted file, it was still important to try to repair the corruption that already took place. QSR technical support provided instructions to fix the file, including:

1. Ensure the file is saved to the computer's hard drive and ensure the file is not accessed remotely. The NVivo file and program should be located on the same machine.
2. Ensure the file is closed; do so by clicking "File," and then "Close."
3. Under "File," "Manage," click "Compact and Repair Project. "
4. When the "Select Project" dialogue box appears, locate the file and select it. To repair a single project, select NVivo Projects (.nvp) in the drop-down menu.
5. From the same dialogue box, open the file you have selected.

Upon following these instructions, NVivo9 immediately attempted to repair the file. The repaired file was saved under a new file name. We continued to access the file only from the original computer where the program and file were stored.

To safeguard against losing the data that had been corrupted, we exported all of the coded data to an Excel spreadsheet. From NVivo9, data within each node was exported to Word. From there, we copied the data into Excel, along with other related data such as participant number, affiliation (e.g., military or civilian), and so on. The data in Excel is set up so that every row corresponds with one piece of coded data. For example, if a single participant had six pieces of coded data within their interview, there would be six rows in the Excel file for that one participant.

4. Scenario Development and Application

People are accustomed to telling and listening to stories to share information and experiences, pass on wisdom, record history, represent beliefs, and explore new ideas. In the form of parables, legends, and real-life examples, stories are an effective pedagogical device to teach key principles (Andrews, Hull, & Donahue, 2009). As Andrews and colleagues (2009, p. 7) point out, stories "facilitate instruction directly through verbal or linguistic means and indirectly by aiding in the mental construction of a sequence of events enacted for or by the learner." People attend to stories through plot, challenges and issues, and contextualized situations (O'Brien & Myers, 1987; Savery & Duffy, 1995; Salas, Wilson, Priest, & Guthrie, 2006; as cited in Andrews, Hull, & Donahue, 2009), thereby making them a valuable instrument for learning.

In fact, the CAF has a long history of using fictional storytelling as an instrument for considering future military concepts, sharing new ideas, documenting lessons learned, engaging stakeholders, and developing tactics and procedures for operations (Godefrey, 2005). As Godefrey (2005, p. 127) writes, "military fictional writing allows defence organizations to stimulate interest and debate in past, present and potential future conflicts…[and it] serves as a record of possible decisions and is often the first step in bringing future army capabilities to fruition." Around 1950, literary devices were used to consider Canadian Army concepts for possible nuclear war, which included its activities (destroying enemy bombing bases), its structure (three battalions of airborne over a division), and its equipment (a battle suit that could be used at high-altitudes or underwater) (Godefrey, 2005). Others included consideration of the impact of civil war in Canada amidst the FLQ Crisis in the late 1960s or the collapse of the NATO-Warsaw Pact and subsequent war in the late 1970s (Godefrey, 2005). Most often, these literary devices were used to consider "what if" scenarios in considering future army concepts and, in some cases, adopted a critical stance of the current institution (Godefrey, 2005). But they also may serve as strong narratives to facilitate particular skills in contexts or cope with the horrible experiences of war.

Andrews and colleagues (2009) explain that stories can be used as instruction in four different ways, including case-based instruction, scenario-based instruction, narrative-based instruction and problem-based instruction. Case-based instruction typically details a concrete historical event and has the problem and answer fixed within the case. The trainee acts as an outside observer, contemplating the issues that arose. Narrative-based instruction also has a problem and solution fixed in the story, but the instructor controls all of the information that the trainee receives. The key to the narrative-based approach is emotional engagement. It is often used in therapeutic interventions for helping individuals piece together traumatic experiences and construct a healthy coherent narrative of past events (DeMeester, 2010). Scenario-based instruction, according to Andrews et al., fixes the solution criteria, but not the actual solution. A trainee is positioned within a realistic scenario that allows them to interact and devise different outcomes, which are primarily based on previous training and professional standard operating procedures. In this sense, evaluation of trainees' performance is easily measured. Finally, problem-based instruction is used to teach trainees how to resolve problems that do not have ready-made solutions. Trainees learn how to cope with ambiguity and embrace uncertainty.

Another method that uses stories or scenarios is situational judgement testing. Trainees read a scenario and then can either rate a particular response or choose from one of a number of responses (McDaniel & Nguyen, 2001). SJTs can be used as a learning tool to practice using concepts and as an ongoing assessment of learning. Typically, they are used as selection tools by human resources

departments, but they are also well suited to measure job performance (O'Connell, Hartman, McDaniel, Grubb, & Lawrence, 2007, as cited in Durlach, Wansbury, & Wilkinson, 2008).

In the following chapter, we review scenario-based learning (including scenario-based and problem-based instruction – Andrews et al., 2009), situational judgement tests, and case-based instruction (or case studies). We also provide an example of each based on the data that was captured from previous work examining civil-military collaboration (Thomson et al., 2010; Thomson et al., 2011a; Thomson et al., 2011b; Filardo et al., 2013) and coded for this project.

4.1 Scenario-Based Learning

One type of storytelling widely used today as a teaching tool is the scenario. Derived from the Latin *scaena*, meaning "scene" (Ringland, 1998, as cited in van Notten, 2005) or more specifically "dramatic scene," scenarios provide students with opportunities to explore realistic situations and, in so doing, allow them to apply acquired skills, tackle relevant problems, contemplate matters of professional knowledge, and explore issues (Errington, 2011). Though there is often an answer to the problem in scenario-based instruction, trainees gain an opportunity to attempt a number of solutions (Salas, Wilson, Priest, & Guthrie, 2006, as cited in Andrews et al., 2009), which inevitably will lead to a number of "plot twists" (Andrews et al., 2009). The simple objective of the scenario-based learning (i.e., learning by doing) is to build cognitive templates for future action (Andrews et al., 2009).

One way to develop skills like communication, relationship building, and negotiation is through scenario-based learning (SBL). According to Errington (2011), a prominent SBL instructor/lecturer, SBL is an educational approach that uses scenarios to bring about desired learning goals. Scenarios for this kind of learning may include a given set of circumstances, a description of behavior, an outline of events, a human dilemma, or an incident in a professional setting (Errington, 2003, as cited in Errington 2011), and typically involve a storyline. In some cases, the script is well developed, whereas in other cases, it is less developed or "incomplete" (Errington, 2011), which allows for more creative opportunities for the trainees.

Central to SBL is the emphasis on practice (Errington, 2011). According to Mariappan, Shih, and Schrader (2004), the focus of SBL is performance improvement rather than the acquisition of knowledge and skills, though obviously such acquisition may be a side-effect of the learning session. Trainees engage in activities that reflect those undertaken in their profession. They adopt a "work-based identity," play out the scenario, and seek to attain a new improved identity (Errington, 2011). In other words, trainees are encouraged to move from an actual identity to a preferred identity. SBL provides a high-fidelity training environment that contributes to trainee growth but does not entail the consequences of the real world. As such, SBL scenarios can motivate students to recognize the value of exploring the situation and the benefit of receiving immediate assessment/feedback as part of their learning. SBL is a good way to engage trainees, while they master a competency (Mariappan, Shih, Schrader, 2004).

Depending on the teaching goals, which drive the design of the scenarios (Andrews et al., 2009), Errington (2011) explains that the scenarios themselves can be developed to focus on skills, problems, issues, or speculation. For example, he explains that skills-based scenarios are basic scenarios that allow students to demonstrate what they have already learned or understand about facts, principles and procedures. These scenarios are most appropriate when the following conditions are met:

- knowledge is fixed and has specific steps and procedures,
- abilities can be expressed in practical situations,

- behavioural expectations are clearly defined, and
- roles and responsibilities are known.

In skills-based learning trainees typically view a video scenario that is specific to the particular desired skill. A narrator highlights the appropriate manifestation of the skill, and at different stages of the interaction between the two (or more) actors in the scenario, the narrator would stress particular ways to perform. The trainer uses the scenario to identify and demonstrate the desired learning skill. The next step is for trainees to role-play the observed skills. According to Errington, trainees can play any one of the roles in the scenario. However, one separate trainee plays the role of an observer who watches the other trainees and provides immediate feedback. The scenario is repeated so that each member of the group experiences every role. Afterwards there is critical reflection and evaluation, with the emphasis on the desired competency, attainment or failure, and the gulf between intentions and achievement (Errington, 2011). The most effective way to ensure skill acquisition is to role play more than once, providing trainees with multiple opportunities for improvement.

Errington (2011) explains that the advantages of a skills-based scenario are that the trainees put into practice what they learn and that they receive immediate feedback. However, these scenarios are constrained, in that they may prevent trainees from moving beyond simply modeling behaviours, demonstrating their initiative, and operating in a context-rich environment (Errington, 2011).

The following is a description of a skills-based scenario designed for developing interpersonal skills.

Scenario descriptor
You are about to meet a patient for the first time. S/he is in the third bed in Ward Two. Be prepared to enter the Ward.

Focus questions
How will you approach your patient?
What will you say to him/her first? Next? Why?

Figure 1: Skills-based scenario descriptor (Errington, 2011)

Scenarios can also be used to address problems. Problem-based scenarios are designed to enable trainees to focus on the decision-making process itself rather than on a single "correct" answer, as "the journey is more important than the destination" (Errington, 2011, p. 7). As Errington explains, trainees are presented with specific open-ended problems in which they are required to consider their tacit knowledge about a situation (including similar situations) and apply this knowledge as they react to emerging problems. Throughout this exercise, trainees' decision-making capacity is tested. They acquire new knowledge and arrive at solutions based on justifiable reasons. In essence, problem-based scenarios help trainees to react to an unknown situation and to learn how to cope with ambiguity and embrace uncertainty. A problem-based scenario is an instrument to reveal declarative and abstract knowledge and apply it to a real-world problem (Wood, 2003; Barrows, 1980; as cited in Andrews et al., 2009).

Errington (2011) explains the procedure for problem-based scenarios as follows. Trainees are presented with the scenario. At this time, they determine what they know about the case and what they do not know about the case, but need to know. Following this determination, trainees break into groups and adopt a role, as in the skills-based example. Again, one trainee acts as the observer of the exercise in order to provide feedback while the others role-play. Everyone has an opportunity to adopt

each role. Once the scenarios have been completed, all trainees present their findings, observations, problems, and resolutions in a group setting. Errington points out that the focus of analysis is the process in complex contexts as well as the trainees' performance, considering both behaviour and the ability to cope with ambiguity and uncertainty.

Advantages of problem-based scenarios include learning to deal with a combination of skill sets, from simple to complex, realizing that simple situations can be complex contextual variables are added into the mix, and learning to address ambiguity and uncertainty (Errington, 2011). However, Errington points out that some of the disadvantages of these kinds of scenarios are that they can undermine a trainees' confidence because the solution is not clearly resolved and access to the requisite knowledge to resolve the situation is unclear. Moreover, problem-based scenarios take more time for trainees to work through, which may be further problematized by impatient trainers, willing to supply the "correct" approach.

The following is a description of a problem-based scenario that does not have an immediate answer to the problem.

Scenario descriptor

A male patient has been admitted to Ward 9 during the night. He speaks little if any English, refuses to be physically examined, and seems to be complaining about his throat. His tongue is covered in black fur and he has vomited twice.

Focus questions

What are the underlying problems here? Why?

In this example, there is no clear singular problem inviting one simple solution. Establishing the nature of the problem(s) or issue, is a first priority: Is this scenario a predominantly cultural issue? Is it a simple matter of diagnosing the symptoms? These questions and others will drive the pursuit of the problem, and ultimately students will arrive at one or numerous solutions. On the a problem-based scenario learning journey, students will be required to generate tentative hypotheses about the problem(s) along with ways to help the patient through exercising their emerging role.

Figure 2: Problem-based scenario descriptor (Errington, 2011)

Another way to use SBL is to let trainees have the opportunity to take a position on a particular issue that informs professional practice and to adopt another perspective through role-play (Errington, 2011). Referred to as issue-based scenarios, these are designed to enable trainees to gain a broad understanding of a real-world issue from multiple perspectives, and to learn about human motivations, agency, and interests (Errington, 2011). It is also believed that this kind of perspective-taking fosters empathy in the trainees (Errington, 1997, as cited in Errington, 2011). Trainees can address an issue from a principled position, for example, but also learn through role-play that real people exist, have a stake in the decisions, and are impacted by these as well.

In issue-based scenarios, trainees adopt different roles and debate the issue, using the scenario as the context to test various positions. Ultimately, issue-based scenarios help trainees to develop an evidence-based position on relevant issues that concern their profession. Errington (2011) points out that these scenarios are beneficial because they force trainees to consider multiple positions; present

opportunities to enhance decision-making skills regarding issues that concern more than themselves and to establish a position based on holistic evidence; shed light on the complexity of human motivation and agency; and promote self-awareness. For issue-based scenario teaching to be effective, time should be set aside to explore the multiple perspectives and not just a few; the issues need to be relevant to the profession; trainees need to be open to positions other than their own; and trainers need to understand the issues well enough for sound instruction (Errington, 2011).

The following is an example of an issue-based scenario descriptor that considers the question of euthanasia.

An issue-based scenario: 'Euthanasia

Scenario descriptor

You are a member of the jury where the accused is charged with murdering her mother who was experiencing severe pain as a victim of cancer. In her defence, the accused said that she was asked by her mother to end her life painlessly. The accused administered an overdose of morphine to her mother.

Focus questions

What are the issues here?

What is your position? Why?

Figure 3: Issue-based scenario descriptor (Errington, 2011)

Finally, speculative-based scenarios are designed so that trainees must contemplate a range of past, present, and future factors that influence current trends, perceptions, and issues (Errington, 2011). Trainees must formulate hypotheses, gather evidence to support or refute their hypotheses, and present their arguments for evaluation. According to Errington, these kinds of scenarios are a combination of the other three – skills, problem, and issue – and ultimately raise awareness regarding the inevitability of change within their profession. They require trainees to look out to the future and to make predictions based on the evidence that they have gathered. Speculation requires trainees to ask "What would happen if?" or "Why did that happen?" (Errington, 2011).

Groups are composed of a number of trainees who brainstorm the issue and speculate about possible views. Errington (2011) explains that speculative-based scenarios allow trainees to see the interconnectedness of knowledge, to explore how their beliefs and values influence their speculations, and to reflect upon how the future shapes our identity. Speculating about future events is also psychologically comfortable for trainees because there are no wrong answers. However, speculative-based scenarios may take a great deal of time and may require too many resources to be meaningful.

The following is an example of speculative-based scenario.

A Speculative-based scenario: 'Almost Immortal'

Scenario descriptor

Welcome to the Year 2061. Thanks to advances in medicine and technology it is now possible to live almost forever. Unless you are killed accidentally, commit suicide/euthanasia, or die in some natural disaster, you are virtually immortal.

Focus questions

What do you see as the main consequences for the following factors in almost living forever:-
Social? Cultural? Technological? Educational? Spiritual? Personal? Political? Environmental? Other?

Adapted from Murray (2010:261)

Figure 4: Speculative-based scenario descriptor (Errington, 2011)

Lynch (2005) details a program for using SBL to give police officers the skills to prepare for life-threatening events. Thinking about the positive impact of scenario-based training, he states that "the one with the best plan, along with a survival mindset and a strong will to succeed, usually wins" (Lynch, 2005, p. 2). SBL provides a realistic setting for officers to learn how to react to hostile situations with the appropriate skills and abilities before he or she hits the streets. When designing SBL, Lynch explains, it is necessary to define what the training objectives are at the beginning and to identify the particular competencies that are to be developed (e.g., officer safety, use of force, etc.). As shown in Figure 5, he provides a checklist for developing a scenario specifically for police officer training.

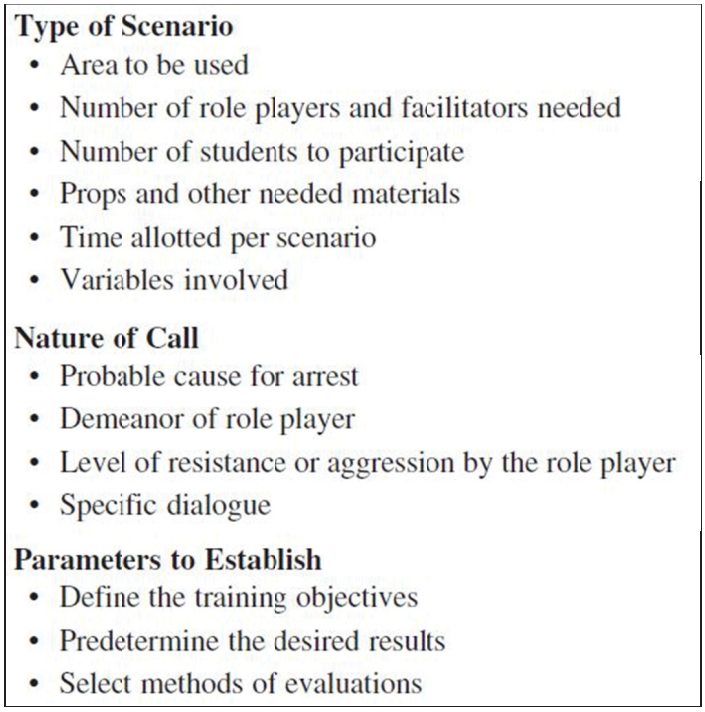

Figure 5: Checklist for developing a scenario (Lynch, 2005)

Trainees receive instruction by SMEs in advance of SBL in order to gain the requisite knowledge that will be applied in the training. Lynch describes generally the elements that a scenario should contain (e.g., belligerent subject), and emphasizes the need to have scene parameters well determined in advance, presumably so that standard operating procedures can be measured.

Lynch (2005) also identifies ways in which scenarios can be evaluated, insisting that these need to be constructive to maximize learning opportunities. He, therefore, cautions about making the trainee feel demeaned. A balance of positive and negative feedback is the best approach, he argues, as it ultimately helps trainees to become more effective self-evaluators. He does encourage trainees to track and document their performance as a means to further development. Though not explicitly stated, Lynch describes a skills-based approach to police officer training.

Research shows that SBL may positively impact trainees' mastery of particular skills and knowledge of particular concepts. For example, based on a National Training Laboratory study conducted in the United States (US), Mariappan et al. (2004) reported that knowledge retention was greater when "learning by doing" methods were used compared to more common instruction methods, such as lectures, demonstrations, or group discussions. Examining ethical awareness and decision-making processes in US Military Academy cadets, Pleban and colleagues (2011) found that scenario-based learning as a training intervention led to increases in cadets' levels of ethical awareness moreso than other methods. Moreover, SBL also impacted cadets' perceptions of their own abilities. Many of those who received SBL reported that it helped them address ethical issues and problems.

Ong and colleagues (2012) also found that a self-paced SBL tool that could be updated to reflect changing military operations was a good means of instruction, especially when militaries face time constraints regarding training. The context for their training centred on stability operations in Joint, Interagency, Intergovernmental, and Multinational (JIIM) environments, and was designed to

interweave training doctrine with the scenarios. The goal of training was to improve soldiers' declarative knowledge regarding stability operations[3].

To develop their scenarios, Ong et al. (2012) reviewed training doctrine, interviewed both civilian and military SMEs, and conducted a training requirements analysis through work with instructors at the US Army Command and General Staff College (CGSC). Following this, they created three training tutorials, each containing a JIIM-related scenario, which were designed to challenge trainees' ability to apply their knowledge and cognitive skills when assessing a situation, to generate options, and to evaluate these options. Trainees were presented with several questions or dilemmas related to the scenario. Trainees also received expert points of view for each challenge and could source reference materials. Following the scenarios, knowledge tests were performed to determine whether or not trainees' showed improvements on knowledge of JIIM and collaboration issues as a result of the SBL. Ong et al. found that appropriate responses increased following the training.

Unlike the approaches of Errington and Lynch to scenario-based learning, Ong et al.'s (2012) trainees interacted with a computer and not with other trainees. There was no role-playing to speak of in this approach and, for the most part, there were "correct" responses to the situation. Nevertheless, Ong et al. do provide evidence that SBL has positive impacts on training and knowledge and skill acquisition and that it can be applied in a different way. Indeed, in the absence of an instructor, participants showed improvements in their capacity to understand JIIM operating environments and to react to challenges. Moreover, participant feedback was generally positive.

There seem to be number of benefits to using SBL. Errington (2011) argues that SBL bridges disciplinary content (theory) with professional practice, provides opportunities to observe role models in workplace contexts, requires trainees to test the expected abilities of the profession, and evaluates trainees' performance against industry standards. Moreover, SBL is immersive, fun, and allows trainees to make mistakes within a safe training environment (Mariappan et al., 2004), not to mention that it provides immediate feedback to the trainee.

It is no wonder, then, that this method is already utilized in specific CAF courses taught at the Peace Support Training Centre in Kingston, Ontario, including the Peace Support Operator course and the Civil Military Cooperation (CIMIC) Operator and Staff Officer courses. For these, trainees are presented with a number of role-playing scenarios to apply the knowledge and skills that they have learned throughout the course (e.g., communication, negotiation, etc.). Often, trainees face problem-based scenarios that do not have ready-made solutions. Trainees, therefore, learn to transfer their newly acquired skills to novel situations. In accordance with problem-based scenarios, trainees have an opportunity to cope with ambiguity and embrace uncertainty.

Other CAF operational training includes speculative-based scenarios. For example, the Army of Tomorrow Seminar War Game (AoT SWG) used an elaborate scenario approach "to provide an

[3] Scenario 1: *Security in Sudan* reflected the United Nations experience enforcing the Comprehensive Peace Agreement in 2007 in Sudan. The scenario was designed to help the student understand the variety of actors at work in such an operation, understand the effects of cultural competence, understand the coordination necessary to achieve mission objectives, make assessments of the security situation, and evaluate the different actors along several dimensions. Scenario 2: *Governance and justice in Haiti* was based on the 1994 intervention. For this, trainees were asked to conduct a mission analysis by examining tasks from multiple perspectives with differing priorities, assess risks and resources, and assess stakeholder agendas. Scenario 3: *Humanitarian assistance and economic development in Afghanistan* was based on a hypothetical natural disaster. Trainees were required to coordinate the integration of civilian reserve personnel into Provincial Reconstruction Teams and to gain information about threat activities in the area.

illustrated narrative of the emerging future security environment and those future army technologies" as well as "to provide a starting point for informed consideration and debate of army future concepts and technological development" (Directorate of Land Strategic Concepts, 2005, p. 121). The extensive fictional story, *Crisis in Zefra*, specifically considered future command and control, new technologies, techniques and procedures, which allowed members to assess the current CAF institution and what it might need to look like in the future (Directorate of Land Strategic Concepts, 2005). *Crisis in Zefra* is a product of the DLSC Futures Project. It was researched by a DLSC research team and then compiled and written by a science fiction writer for the purposes of providing simulation and informed thinking on possibilities the Canadian Army might face in the next 20 years. During the particular exercise, it was primarily used as a point of departure for CAF members to discuss the AoT in future security environments. Given its speculative nature, this fictional scenario represents only one possible future for the Canadian Army. CAF personnel were encouraged to log on to the Directorate of Land Strategic Concepts website to debate the questions raised in the story and consider future Canadian Army requirements.

Another example of the CAF using speculative-based scenarios is the Civilian Military Seminar on Humanitarian Disaster Response. A scenario was developed to provide the context for trainees to engage in a comprehensive approach to resolve a number of challenges facing the host nation Haiti in 2014. A brief description was provided to trainees about the situation and its challenges. Trainees worked together to bring about resolution to particular challenges. Because this scenario occurs in the future, it is also an opportunity for trainees to explore what may be needed with respect to the future CAF and its response to international crises.

For the purposes of this project, we consider smaller stories that reflect critical incidences in operations and therefore concentrate more on skill-based or problem-based scenario development. We argue that the coded data could be effectively used to develop skills-based scenarios and problem-solving scenarios to train communication, relationship building, and negotiation skills. The following is an example of SBL, using the data collected from previous research activities (Thomson et al., 2010; Thomson et al., 2011a; Thomson et al., 2011b; Filardo et al., 2013) and coded for this project.

4.1.1 SBL example

Research has shown that civil-military collaboration may be constrained in part because military and civilian personnel do not fully recognize or acknowledge the other's expertise, experience, and contribution to the challenge at hand (e.g., security or development project) (Thomson et al., 2011b). Full appreciation of the other's contribution in the situation is not always expressed and, as a result, relationships may be negatively affected. The following scenario is an example meant to train and evaluate relationship building – appreciation. We chose a problem-based scenario. Unlike the skills-based scenario, this approach has neither specific behavioural expectations nor steps/procedures to follow (Errington, 2011). As such, trainees have an opportunity to choose from a variety of possible solutions (Salas, Wilson, Priest, & Guthrie, 2006, as cited in Andrews et al., 2009) and to centre their attention on the decision-making process (Errington, 2011).

To construct the scenario, we reviewed examples from the data that were categorized as suboptimal appreciation behaviours (e.g., disrespect, stereotyping), which were provided by military and civilian SMEs (Thomson et al., 2010; Thomson et al., 2011a; Thomson et al., 2011b; Filardo et al., 2013). Once we had our examples that we wanted to incorporate into the scenario, we decided on a situation (i.e., discussion between CAF and NGO) in which these behaviours could be expressed. The script presents a problem in which a member of the CAF must approach a member of an NGO to communicate improvised explosive device (IED) activity in the area and ask them to report their

movements. It seemed appropriate to have this scenario follow a role-playing method since there is not an obvious solution to the problem, and it calls upon trainees to put themselves in the shoes of both parties (i.e., CAF and NGO) as they work through it.

With a focus on appreciation and to a lesser extent creating an effective atmosphere, the scenario considers variables such as stereotypes and acknowledging the counterpart's contribution. Trainees enter the scenario believing that the other holds a particular stereotype of them, which may lead to polarizing identities. Overcoming that barrier will be something that each trainee has to consider when speaking with one another and seeking to build a relationship. Moreover, taking charge of the situation may also hinder relationship building. Since the CAF personnel in the scenario is requesting information about the NGO's movements, it will be important to express a benevolent attitude rather than a take-charge attitude. Moreover, trainees should act respectful of one another to build the relationship.

As an open-ended, problem-based scenario, details such as specific actions to be taken by participants are left out. It is an incomplete script, which provides participants more opportunity to apply their knowledge (Errington, 2011). The incomplete script and expectation for improvisation allows for more plot twists to occur, which ideally will foster performance improvement, especially when the scenario is played out multiple times (Andrews et al., 2009; Mariappan et al., 2004). Trainees are expected to address the problem using their tacit knowledge gained previously in a lecture-based format. Figure 6 shows the basic instructions.

Objectives:
Act out the role given in the description and work through the scenario, adapting as needed.
Reach the end goal within the scenario (note: not all roles may be aware of what the goal is; the scenario ends when the goal is reached or when the instructor sees fit).
Identify the relationship building (in)competencies present in the scenario.

Questions for study:
What approaches would be optimal to foster relationship building?
Switch roles and re-enact the scenario.

Figure 6: Basic instructions for SBL

NGO counterpart: Your organization is in an occupied country helping provide food and water to the locals. The village you are currently assisting has had very few hostile encounters in the weeks since you started going there. However, you are aware that the roads leading up to the village are incredibly risky due to IEDs. Everything is running fairly smoothly, when a military vehicle shows up. One of the Canadian Forces officers approaches you directly and inquires why you have not notified them of your activities in this area. You found no reason to inform them of your operation, since you believe the military is usually to blame for hostile engagements, and is likely the cause of the IED activity in the first place. You prefer not to interact with the military because you know that they tend to think of people working for NGOs as just Birkenstock-wearing "hippies". You feel the Canadian Forces have no business being there.

CF counterpart: You have been deployed on a peacekeeping mission to an occupied country. There have been reports of Non-Governmental Organizations going into a village, the road leading up to which having a lot of IED activity in the last week. You are tasked with approaching the NGO to make them aware of this activity and ask them to report when they will be travelling there. You are apprehensive about doing this because you have limited experience dealing with NGOs and have heard in the past of negative relations with NGO personnel who have made derogatory remarks about the CF being "knuckle draggers" and not needed in this environment. Your goal is to convince the NGO to agree to inform you of all future activity in the village.

Figure 7: Scenario-based learning script

Once trainees read the scenario and determine what they know and do not know, they adopt a "work-based identity" and are asked to embrace the roles that are described above, yet improvise as the scenario progresses. Trainees seek a resolution to the problem while playing their assigned roles. They present their findings, observations, challenges, and solutions to the group and then discuss with the instructor, once given the opportunity. Again, the advantage of SBL is that trainees get the chance to practice their skills in a realistic context.

4.2 Situational Judgement Tests

Used for a number of years (Whetzel & McDaniel, 2009), situational judgement tests (SJTs) are a measurement method in which respondents read a situation (i.e., a scenario) and evaluate several possible responses to the situation (McDaniel & Nguyen, 2001). SJTs are designed to assess knowledge of concepts, the integration of multiple concepts, and the application of that knowledge to realistic situations (Ong et al., 2012). While they describe realistic situations, SJTs do not require active role-playing, and thus are quite different from scenario-based learning tasks. SJTs can be used as a learning tool to practice using concepts and as an ongoing assessment of learning. Ong et al. (2012) also argue that SJTs can be used in an after-action review capacity by summing up findings across SJTs. Most often, SJTs are used for personnel selection and the prediction of performance (O'Connell, Hartman, McDaniel, Grubb, & Lawrence, 2007, as cited in Durlach, Wansbury, & Wilkinson, 2008). They have also been used in shortlisting potential job applicants (Griffiths, Ausobsky, Steger, Waghorn, & Cochrane, 2013; Patterson, Baron, Carr, Plint, & Lane, 2009). For the CA training toolkit, it would be useful to use SJTs to measure training performance as well as to select appropriate candidates with the appropriate competencies (e.g., communication and relationship building skills) to operate in CA contexts.

An SJT is composed of a number of items. Each item contains a stem (i.e., a situation or "scene") and responses (i.e., a list of possible responses to the situation). For example, an SJT designed to measure knowledge of relationship building and communication may include items associated with building trust (e.g., credibility, transparency) and control (e.g., open and honest communication). For each item, stems and responses are developed.

According to McDaniel and Nguyen (2001), to develop stems for an SJT, it is necessary to speak with SMEs and elicit from them relevant, critical incidents. Critical incidents are SMEs' experiential stories in certain types of situations that pertain specifically to the concept of interest. Once critical incidents are collected, for example through interviews, researchers may review them and identify situation descriptions appropriate as stems for the SJT. Similar critical incidents can be grouped into similar content areas and a representative situation can then be chosen from each content area. These situations can be edited to make them more general rather than specific (e.g., experiences dealing with local populations generally rather than dealing with specific individuals).

McDaniel and Nguyen (2001) point out that things to consider when developing stems are the format for presenting the stem (e.g., written format or video), how long the stem should be (e.g., short description or detailed description), and how complex the stem should be (e.g., simple scenario or complex scenario). Choosing the appropriate format will depend upon the resources available, such as time and money, as well as the training objectives. However, there is evidence that video-based SJTs are more effective than written SJTs for predicting performance in high-stakes settings (Whetzel & McDaniel, 2009). Research shows that trainees see more face validity in video-based SJTs than written SJTs (Chan & Schmitt, 1997; Richman-Hirsch, Olson-Buchanan, & Drasgow, 2000; as cited in Whetzel & McDaniel, 2009), and this might be because there is relatively greater contextual information for trainees to access and utilize in videos (Olson-Buchanan & Drasgow, 2006, as cited in Whetzel & McDaniel, 2009).

Lievens and Sackett (2006) also considered the predictive validity of video-based SJTs in comparison to written SJTs and found that validity findings varied depending on the situation or type of skill. Specifically, they found that a video-based SJT of an interpersonal situation had higher predictive and incremental validity for predicting interpersonally oriented criteria (i.e., scores from interpersonally oriented courses) than the same SJT presented in a written format. However, the written format SJT

had a higher correlation with cognitive ability (i.e., GPA scores). These findings suggest that the SJT format used for training should reflect the goals of the training program (e.g., interpersonal skills vs. knowledge skills) and be strongly considered as a consequence.

Following stem development, the next step is to assemble the reviewed and edited stems (McDaniel & Nguyen, 2001). Stems should be administered to a second set of individuals who are asked to read the stems and identify what they would do or what they believe is the best thing to do in each situation. They could also be asked to provide more than one response to the situation (i.e., identify both the optimal and suboptimal response). This approach gives one an opportunity to consider both what one should do and what one should not do in a particular situation. McDaniel and Nguyen argue that this task can be completed by both SMEs and novices. SMEs should be able to identify the best responses to the situation and, based on their experiences, to also identify non-optimal responses. Novices can offer responses with a wide range of effectiveness. It is important to point out that the responses to situations are not necessarily objectively true answers, but rather they reflect "a pattern of judgement" (Durlach et al., 2008).

Once response feedback is received, the test developer should review all the offered responses for each stem (McDaniel & Nguyen, 2001). Responses should be edited to remove duplicates and to increase comprehensibility. Responses where the SMEs fail to show substantial agreement should also be dropped. In the end, each stem should have multiple responses that span a range of effectiveness (i.e., from appropriate responses to inappropriate responses). Again, this provides trainees with an opportunity to consider what one should do and what one should not do in a particular situation. Ultimately, responses should be validated by SMEs.

Once the list of responses for each item stem has been developed, the instructions to respondents must be considered. For example, McDaniel and Nguyen (2001) suggest the following as examples.

- "Identify the response you would most likely perform." A variation is to also add "and that you would least likely perform."
- "Identify the best response to the situation." A variation is to also add "and the worst response to the situation."
- "Rate the effectiveness of each response."

The choice of instruction used has an impact on validity (cf. McDaniel & Nguyen, 2001). For example, McDaniel and Whetzel (2007. as cited in Whetzel & McDaniel, 2009) conducted research to test construct validity of SJTs. The researchers administered the same stems with a knowledge response instruction (e.g., to identify the best response to the situation) and a behavioural tendency response instruction (e.g., to identify the response that you would most likely perform). Those SJTs administered using knowledge response instructions had larger correlations with cognitive ability scores than those administered using behavioural tendency response instructions, which had larger correlations with personality scores. These findings suggest that changing the response instructions can alter the interpretation of the construct being measured.

Estimating reliability for SJTs may also be problematic because SJT responses typically measure more than one construct (Whetzel & McDaniel, 2009). For example, a response might be "You listen to your negotiation counterpart's concerns and work toward achieving satisfactory outcomes for both parties." A trainee might think that this is the optimal response because a) the respondent is being cooperative or b) she is identifying shared areas of interest. Both correct, the responses measures more than one construct. Consequently, responses may not have clear factor loadings with factor analysis and, in turn, may result in heterogeneous scales. Given this problem with heterogeneous

scales, Whetzel and McDaniel recommend using test-retest and parallel forms reliability as reliability estimation methods for SJTs rather than Cronbach's alpha. Caution, therefore, must be taken to ensure that the responses are constructed in a way that will actually measure the construct of interest.

McDaniel and Nguyen (2001) also point out that instruction wording impacts trainees' ability to fake their answers. Faking is defined as "an individual's conscious distortion of responses to score favourably" (Whetzel & McDaniel, 2009, p. 198). To reduce faking, Nguyen, Biderman, and McDaniel (2005, as cited in Whetzel & McDaniel, 2009) suggest using knowledge response instructions, rather than behavioural tendency response instructions.

Whetzel and McDaniel (2009) recommend the use of knowledge response instructions, asking trainees to rate each response option on a Likert-type scale of effectiveness, with the responses being ultimately recoded into dichotomies (i.e., effective, ineffective). The Likert-type scale is preferable because it satisfies respondents' common need to express a nuance of degree regarding their judgement of effectiveness. However, these Likert-type scales should then be recoded into dichotomies. Whetzel and McDaniel argue that using dichotomies is preferable for a couple of reasons. First, it can be hard to make a distinction between what is "extremely effective" and what is "very effective" in an adversarial situation. Also, there are likely to be individual differences in how trainees respond to Likert-type scales. Some prefer using the extreme scale anchors (e.g., 1 and 6 on a 6-point Likert scale), whereas others prefer using more moderate scale anchors (e.g., 2 and 5 on a 6-point Likert scale). Dichotomizing removes these individual differences in the use of rating scales. Whetzel and McDaniel note that the Likert-type scales included in the SJTs should have an even number of rating points (e.g., a 4-point scale or a 6-point scale) to facilitate the dichotomization. This is due to the difficulty of assigning the middle point of a rating scale to the effective or ineffective category.

Before administering an SJT, researchers must decide upon a scoring method for the data. McDaniel and Nguyen (2001) identify four different ways to accomplish this. The most common scoring method, expert-based scoring keys, is usually developed by asking SMEs and novices to make judgements about the effectiveness of the item responses (McDaniel & Nguyen, 2001). These judgements are pooled using consensus or actuarial methods, thereby generating a normative pattern of responses. Scoring keys can also be developed so as to reflect consensus. McDaniel and Nguyen explain that these are constructed using central tendency statistics to determine which responses are more effective and which are less effective. A trainee's score is compared to the normative pattern and determined, according to Durlach et al. (2008), by the level of conformity to the normative pattern of the desirable group. Another way to develop scoring keys is by using an empirical scoring methodology in which items are scored according to their relationships with a criterion measure (Whetzel & McDaniel, 2009). Finally, theoretical scoring keys are constructed to reflect theory, or theory can be used to identify the best or worst response items (Whetzel & McDaniel). Whetzel and McDaniel (2009) note that the scoring method used can impact on validity estimates. That is, it may appear that an SJT is not valid when, in fact, it is the scoring key that is not valid. Unfortunately, there is insufficient research at this time to identify one scoring strategy to be superior to another.

A great deal of successful research has used the SJT. For example, Durlach, Wansbury, and Wilkinson (2008) provide a good example of how SJTs can be used for evaluating training in a military context. They developed an SJT to measure the effectiveness of negotiation training that US military personnel received. Specifically, the SJT was developed as an assessment tool for soldiers to complete before and after training on the Enhanced Learning Environments with Creative Technologies for Bi-Lateral Negotiation (BiLAT) system, a game-based prototype for training negotiation skills appropriate for

Iraqi cultural settings. Increases in the SJT score from pre- to post-training were said to suggest an increase in the soldier's ability to apply negotiation strategies and tactics.

To develop the SJT, the BiLAT project partners collaborated to generate over 20 scenarios and responses (Durlach et al., 2008). The researchers provided this initial set of items to expert instructors, who evaluated each item and helped the researchers reduce the number of items. The reduced set of items was then provided to four independent SMEs, who judged the "goodness" of the response statements for each stem. After receiving this feedback, Durlach et al. chose to include those stems and responses that maximized SME agreement, while still maintaining the most important BiLAT learning objectives. The final SJT included nine scenarios with three or four responses each. An example of an SJT item used by Durlach et al. can be seen in Figure 8.

MAJ O'Rourke is about to meet with a local Iraqi leader for the first time. The MAJ is concerned about the potential outcome of this meeting where he will try to find out information about a suspected insurgent group in the area. What should you tell him?	
Not to worry because whatever happens stays between him and his negotiation partner. If something goes wrong, it's not a big deal.	Poor Moderate Good 0 1 2 3 4 5 6 7 8 9 10
It will help if he has planned for the possible effects of both success and failure of the meeting on the area of operations.	Poor Moderate Good 0 1 2 3 4 5 6 7 8 9 10
He should be ready to put pressure on the local Iraqi leader if he does not immediately provide the information needed.	Poor Moderate Good 0 1 2 3 4 5 6 7 8 9 10

Figure 8: Sample SJT item (Durlach, Wansbury, & Wilkinson, 2008)

Durlach et al. (2008) scored their SJT by first standardizing each individual's response, then computing a correlation between the standardized score and the average of the standardized SME scores.

Durlach et al.'s approach shows that the SJT is an iterative process, but one that yields high returns. SJT provides a strong basis for comparing an individual's pattern of judgement to a normative pattern of a desirable group or training objectives. Moreover, Durlach et al. point out that the SJT appears to have face validity as a measure of relevant knowledge, in their case of negotiation skills, because it discriminated among novice and expert negotiators. As they explain, SJT scores that were significantly higher for those with negotiation experience compared to those without such experience suggest that the SJT is capturing some degree of negotiation ability.

Using the coded data from the current project, SJTs could be developed for selection purposes. Military and civilian SMEs both mentioned that, in a few cases, their organization had sent the wrong member for civil-military collaboration in theatre (Thomson et al., 2011a). A tool that could assess this match in advance of deployment would be useful. Moreover, SJTs could be constructed to specifically examine communication, relationship building, and negotiation performance. We provide

two examples of SJTs that are based on the data collected from previous research activities (Thomson et al., 2010; Thomson et al., 2011a; Thomson et al., 2011b; Filardo et al., 2013).

4.2.1 SJT Example

One of the recurring themes in civil-military collaboration is trust (Thomson et al., 2011a). Building relationships in operations also requires building trust, and our research suggested that this can be accomplished by demonstrating one's credibility (e.g., fulfilling obligations) as well as by being transparent (e.g., open and honest) (Thomson et al., 2011a). We coded SME interviews using those two dimensions and incorporated them into the SJT example.

To begin, we developed a stem, or scenario, that is representative of what trainees may encounter in the field. Reviewing the coded data under the trust building category (i.e., transparency, credibility, secrecy, and non-credibility), we identified appropriate situation descriptions. Rather than identifying one particular example to use in the stem, we created a stem that is a compilation of multiple trust-related examples. Again, building a stem arises from multiple critical incidents that pertain to the concept of interest (e.g., trust) (McDaniel & Nguyen, 2001). The stem represents what SMEs have encountered in the past and is a probabilistic example of what trainees may encounter in civil-military collaboration efforts.

To develop our responses, we again reviewed the coded data to identify both optimal and suboptimal responses. To make sense for the SJT, we modified the language. We chose a behavioural response instruction with a 6-point Likert-type scale that reflected Whetzel and McDaniel's (2009) advice regarding dichotomization. Using an expert scoring approach would help to validate the measure.

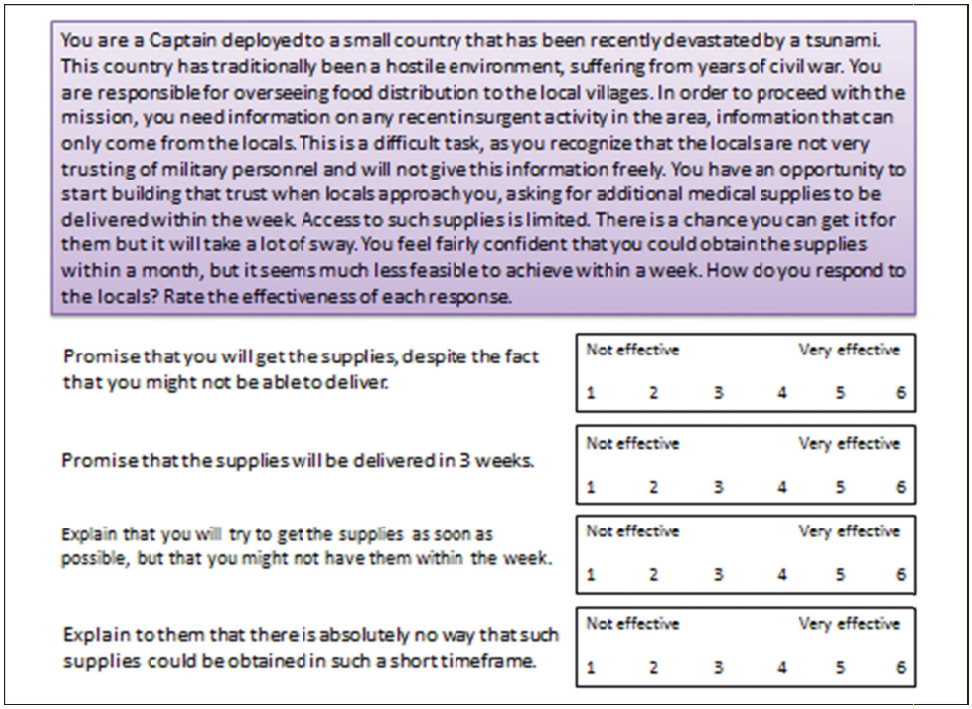

Figure 9: SJT for trust

Once trainees have rated their behavioural responses, they can receive feedback explaining how each course of action could build or erode trust (see figure 10).

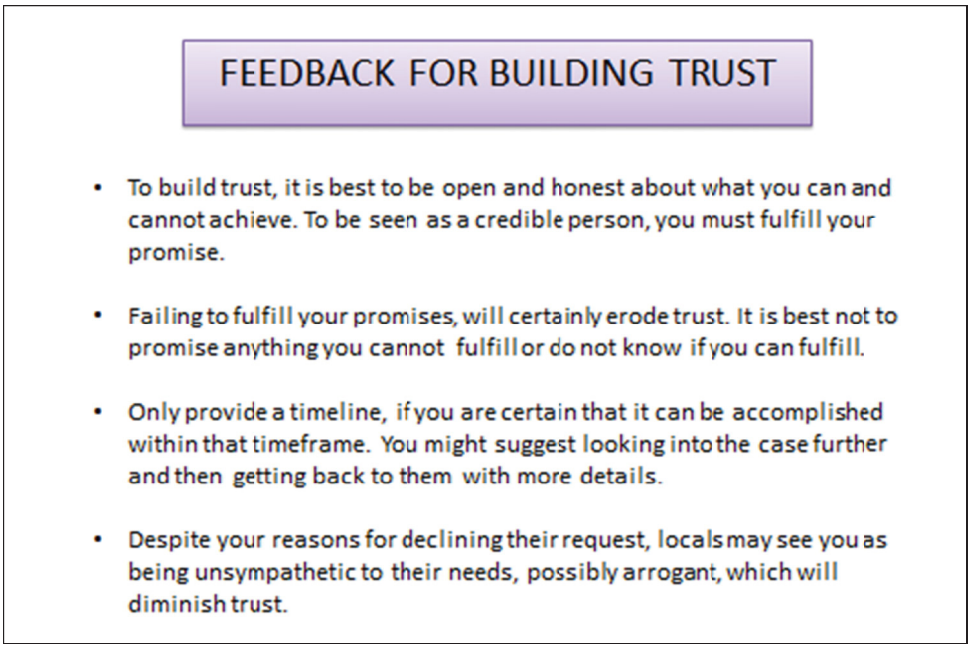

Figure 10: Feedback for building trust

SJTs can also be created without using a Likert-type scale. Instead, trainees can read a scenario and choose, from three or four options, what course of action seems most appropriate. Once trainees make their choice, they get a response that explains to them why their choice was optimal or suboptimal. Trainees can go back to the original scenario and choose another option. Again, they receive feedback regarding the appropriateness of their selection. Using this method can build trainees' knowledge of core concepts, but also identify how he or she would behave in a given situation.

For example, we created an SJT that addressed NGO neutrality (i.e., not taking sides in the conflict) and the notion of creating an effective atmosphere. Research highlights the importance of NGO neutrality in operations in order to remain effective and ensure that resources (e.g., aid) get to those in need, irrespective of which "side" of the conflict they are on (Thomson et al., 2009; Thomson et al., 2011b). Neutrality is also a means for civilians to operate in hostile environments without being targets themselves. As such, some NGOs will have absolutely nothing to do with the military, whereas others will have limited interaction (Thomson et al., 2011b). When NGOs choose to collaborate with the military, creating an effective atmosphere to respect their neutrality is critical.

Using the coded SME data, we identified neutrality as a critical incident and developed an appropriate stem for the SJT. We then sourced the data for possible behavioural responses to the situation. For our purposes, it was necessary to modify some of the responses from the data, so that the points could be made explicitly. We ended up with responses that ranged in effectiveness (i.e., that included appropriate and inappropriate responses). The figures below describe the situation, offer three possible courses of action, and evaluate each choice.

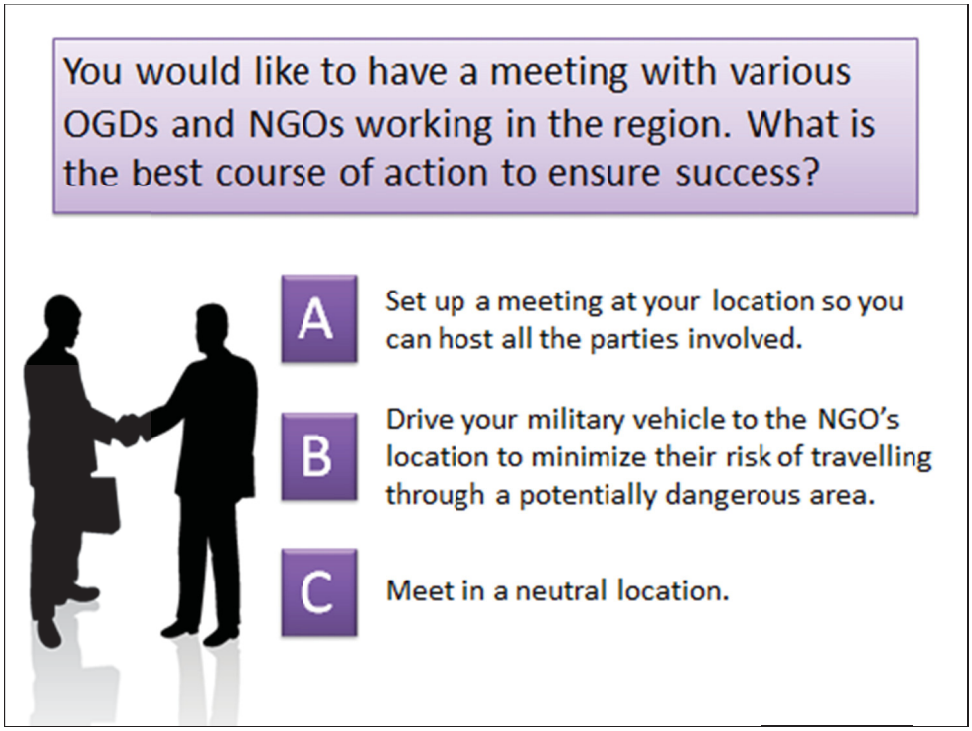

Figure 11: The situation and courses of action

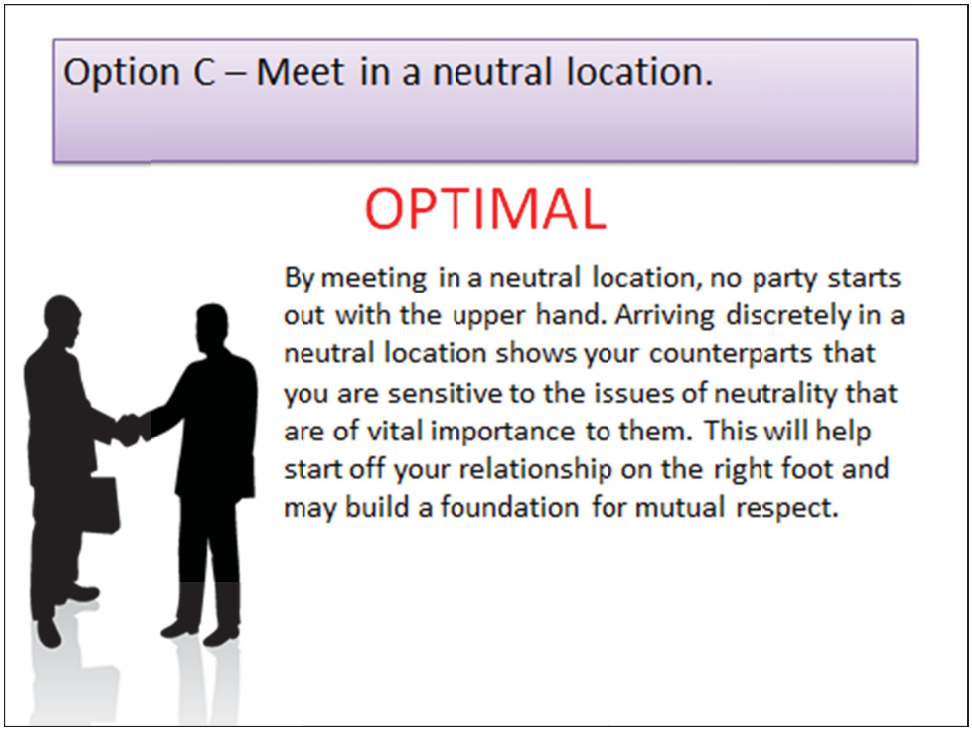

Figure 12: Feedback for choosing option C

Obviously, validating the behavioural responses with SMEs as well as novices would strengthen the SJT as suggested by McDaniel and Nguyen (2001). As it stands, our example reflects more of a theoretical scoring approach than expert scoring approach. We based it on our overall knowledge of NGO-military relationships. Consultation with experts to ensure that response measures are accurate is, therefore, necessary to ensure that the test reflects training needs for comprehensive environments. Nevertheless, this example demonstrates the effectiveness and the varied application of using SJTs to train particular desired skills (e.g., building relationships – creating an effective atmosphere, neutral space) as well as their potential as a tool for the CA training toolkit.

4.3 Case-Based Instruction

Case-based instruction uses cases to assess trainees' abilities to synthesize, evaluate, and apply class material ("Teaching," 1994). Cases are stories typically based on real events, designed to raise an issue (Hutchings, 1993, as cited in Ruggiero, 2002). Case studies are different from scenario-based learning techniques and situational judgment tests in that they simply describe a detailed scenario and call upon trainees to openly discuss the issues and possible solutions. A good case is said to present interest-provoking issues and promote empathy with the central characters (Boehrer & Linsky, 1990, as cited in "Teaching," 1994). The information in the case may be complex or simple, and possible solutions may require a response at one or more levels (e.g., individual, group, or organizational) (Ruggiero, 2002). However, information is usually detailed such that the trainee experiences the challenges and ambiguities that the original actors confronted in the situation (Golich, Boyer, Franko, & Lamy 2000, as cited in Krain, 2010). Traditionally, case studies contain detailed historical information (e.g., statistical data, relevant policy), but more commonly are written from personal perspectives, for example, from SME points of view ("Teaching," 1994).

Typically, the problems and solutions are fixed in case studies, the trainee is an outside observer to the past situation, and the outcomes are defined (Barnes, Christensen, & Hansen, 1994, as cited in Andrews et al., 2009). As such, case studies can show trends and can be used to build a mental model.

However, cases can be constructed so that they are problem-based, and there are a number of reported benefits for using cases that are more problem-based (Krain, 2010). For example, one of the benefits of using cases is that, as an active collaborative learning experience, they can foster a deeper understanding of the key idea and theories (Dewey 1938; Kolb 1984; Coles 1985; Norman and Schmidt 1992; Krain and Lantis, 2006; as cited in Krain, 2010). Moreover, cases enhance trainees' critical thinking and decision-making capabilities, and these are transferable to novel, uncertain situations (Bonwell & Eison, 1991; Lieux 1996; Eyler 2000; as cited in Krain, 2010). They also foster a sense of personal efficacy and willingness to take risks in sharing and exploring ideas (Lamy 2000; Krain & Nurse 2004; Cabrera & Anastasi, 2008; as cited in Krain, 2010). Cases are effective because trainees can learn how to apply theoretical concepts to real events (Krain, 2010). Krain (2010) cautions, however, that case studies are only effective if they are directly linked to other relevant course material and educational objectives.

When developing cases studies, it is best to base them on actual events or experiences ("Teaching," 1994). Such information can be gained through research or lived experiences. Less rigorous than developing stems and responses for SJTs, cases can be as simple as outlining the major components of a problem or issue. In some cases, it will be necessary to gather background materials to provide added context. It is best to share cases with colleagues or SMEs for comments and suggestions, and when possible to pilot each case in order to identify strengths and weaknesses.

The effective use of cases requires instructors to determine the specific goals tht they hope to achieve by using the cases ("Teaching," 1994). Goals can include applying knowledge and principles to complex real world situations, making connections between concepts or disciplines, as well as developing interpersonal skills and the capacity to work as a team (when working in groups). For example, a case study could be developed to assess students' abilities to apply their knowledge of relationship building skills, such as creating an effective atmosphere and appreciation, in realistic scenarios.

According to Ruggiero (2002), cases provide a context through which students learn to:

- identify goals;
- set priorities;
- analyze a situation and develop feasible strategies for action;
- trouble shoot the likelihood of success of proposed actions; and
- identify intended and unintended consequences of proposed actions.

Two key components of any case study are analysis and action (Silverman & Welty, 1995, as cited in Ruggiero, 2002). Analysis involves identifying the facts (e.g., who are the actors? what is the chronology of events?), identifying the problems/issues, and taking a perspective on the problems/issues. Action involves proposing solutions (e.g., what should be done?) and evaluating the solutions (e.g., what would happen if?).

Hatchen (2001, as cited in Ruggiero, 2002) provides suggestions for creating engaging case studies:

- Begin a case with an action rather than with a description (e.g., "You are holding a planning meeting." rather than "There is a planning meeting being held.");
- Use conversations between the main character and others, not just actions (e.g., "Sorry I'm late for the meeting." rather than "The representative arrives late to the meeting.");
- Include enough detail to allow students to imagine what they would experience if they were in the situation. This includes creating vivid images of the setting and characters;
- Have characters express their reactions to the situation on an emotional level (e.g., irritated, frustrated, grateful);
- Use confiding conversations between the main characters and a confidant in a way that shows the thoughts, recollections and ruminations about possible courses of action.

Andrews et al. (2009) also point out that when creating cases it is important to select the most instructive ones as the number of potential cases grows. Moreover, they suggest identifying the most relevant principles but also retaining the context. It is important not to simply present a pile of facts (Andrews et al., 2009). They provide a list of questions that should be answered when developing a case. These include:

- What are the learning points from the case?
- How much interpretation should the instructor infuse when facilitating discussion about the case?
- What should be summarized and what should be detailed? And how does this impact the overall usefulness of the case?
- When and how frequently should cases be used for instruction?

Research shows that trainees prefer case studies that incorporate actual depictions of the individuals affected by the issues, and that by making the case more authentic, trainees become more invested (Krain, 2010). According to research conducted by Krain, this can be achieved by using both written descriptions of the case augmented by the use of film as a further source for the case.

Krain (2010) explains the application of cases studies as follows. Trainees are typically presented with a case (e.g., a written and/or verbal presentation of a scenario), and afterwards they engage in discussions of the issues or conflicts that need to be resolved with other trainees. This discussion is facilitated by the course instructor, who uses questions and prompts to engage the trainees. Trainees reflect on their own responses, but also gain assessment and debriefing from the instructors. Instructors are positioned to reflect back to the larger theoretical context.

Case studies are a very common instrument of pedagogy. They are used to help trainees recognize patterns within a specific domain of action for generalization to similar decision-making contexts (Andrews et al., 2009). Case studies are used in a number of CAF courses, including the Military Professionalism and Ethics course, the Professional Ethics and Defence Management course, and the Joint Command and Staff Programme (Thomson, Hall, & Adams, 2009). We expect that the use of case studies would be an effective way for instructors to generate trainee discussion on issues related to CA, and specifically to skills necessary to work effectively in this kind of operational context (e.g., negotiations between CAF and NGOs, relationship building between CAF and OGDs, communication between CAF and locals). Through the use of case studies, trainees can develop problem-solving and decision-making skills for situations they may experience while in theatre or elsewhere. Case studies are also a means to evaluate what trainees have learned in a training course. The following example arose from the data we coded for this project.

4.3.1 Case Study Example

One of the themes that emerged from investigating civil-military collaboration centred on operational planning. Civilian SMEs that operated in a Whole of Government approach to the war in Afghanistan explained that the extensive CAF process to operational planning and the greater numbers of military personnel on the ground to plan in comparison to their Whole of Government counterparts made it difficult to integrate into the system and add value in a timely manner (Thomson et al., 2011a). Civilian SMEs also pointed out that the military often shared operational plans post hoc, making their contribution irrelevant (Thomson et al., 2011a); whether or not this was intentional is immaterial, because ultimately this has a negative impact on relationship building. These behaviours represent characteristics associated with creating an ineffective atmosphere, including taking control of the situation, inaccessibility, and establishing dominant space. And since these are more subtle characteristics of relationship building, it is important that instructors address them in training.

We chose an example from SME interviews to reflect suboptimal relationship building characteristics, and used it to create a case study. The particular example illustrates an instance of CAF personnel taking control of the situation and establishing dominant space over a Department of Foreign Affairs, Trade and Development (DFATD) representative. Aligned with Hatchen's (2001, as cited in Ruggiero, 2002) suggestion for case study development, we included conversations between actors, details to help imagine the situation, and the actors' thoughts and feelings. We also included a number of questions that may be used to drive discussion among trainees and the instructor.

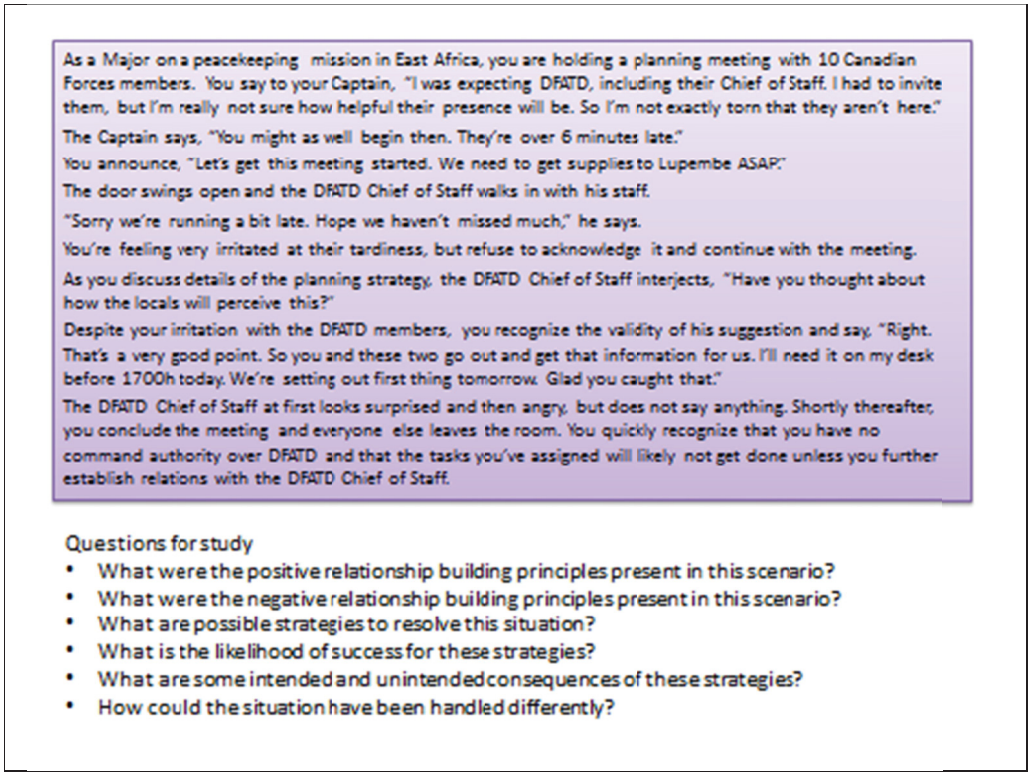

Figure 13: Case study considering creating an effective atmosphere

Case studies are meant to be used following some training, so that trainees can apply their knowledge. As such, trainees would need some class time that instructs them on the subtleties of relationship building and its overall significance to civil-military collaboration in a comprehensive operational environment, before addressing the case.

5. Summary

Based on this review of scenario methodology and application, we identified three effective methods of incorporating scenarios into the CA training toolkit. These include scenario-based learning (SBL), situational judgement tests (SJTs), and case studies.

As identified above, SBL is useful for developing skills that have clearly defined standard operating procedures and outcome expectations (skills-based scenario). Trainees are provided an opportunity to perform skills that would be expected of them in their profession in a realistic context. Because behaviours are well defined, instructors can develop checklists in order to determine if a particular behaviour is expressed or not. SBL may also be used for developing scenarios that ask trainees to work through problems that have ambiguous and uncertain outcomes (problem-based scenario). For these, the activity is meant to focus efforts on the process of problem solving and decision making and less on the expression of tasks. SBL is a role-playing exercise and provides trainees with an opportunity to assume the role of all of the characters in the scenario. Ideally, trainees learn how to take the perspective of all of those actors in the situation, thereby possibly promoting a degree of empathy. SBL can be conducted in a classroom or in a context-rich environment (e.g., planning cell, field exercises) and requires other individuals to role-play. This approach is widely used in CAF training (e.g., CIMIC Operator course).

SJTs also use scenarios. As described above, scenarios are developed from SME input along with the variety of responses to the scenario. SMEs as well as novices can be consulted to generate the most optimal response to a scenario as well as the least optimal response, and responses that novices may raise but SMEs may not consider. This provides a wide variety of possible responses. Using a Likert-type scale, trainees are asked to rate the effectiveness of a particular response. Feedback regarding each choice can be incorporated into the SJT to develop the trainee's knowledge. Using scales is a good way to demonstrate how well an individual's pattern of judgement is aligned with a normative pattern of a desirable group or training objectives. SJTs can measure relevant knowledge. Additionally, SJTs can be created without Likert-type scales. In their place, possible behavioural responses can be used. Trainees choose how they would behave in a particular situation and then they are provided with feedback. This feedback can also reflect a normative pattern of desirable behaviour. Used typically by human resources departments for selection purposes, SJTs can also assess performance by providing a number of possible courses of action and their effectiveness. SJTs can be conducted with computers, which make them very accessible, minimizing required resources.

Finally, case studies include a scenario with detailed information (such as the actors, their thoughts and feelings, and conversations) so that trainees can understand in the perspectives of all actors in a given situation. Case studies are usually based on historic events, but are personalized. They are meant to examine trainees' tacit knowledge regarding a particular concept. Trainees read the case and discuss it amongst themselves with the guidance of an instructor. Case studies help trainees to see patterns and trends across situations and to build mental models. These might be used effectively at the end of a course to evaluate trainees' apprehension of core learning objectives.

The coded data gathered from this project indicate that there is a multitude of scenario examples to be used in the CA training toolkit. When creating scenario examples across all three methods (i.e., SBL, SJT, and case studies), common issues emerged from the data which allowed for the creation of specific scenarios in the core area of relationship building and communication. These scenarios varied in complexity. In one example, the core learning objective was to create an effective atmosphere, whereas in another example, the learning objectives were to create an effective atmosphere and

appreciation. The data were also very useful when adding multiple levels of conflict to a given scenario. For example, a scenario that focused primarily on appreciation could also be easily made to incorporate elements of trust building. The data set from this project provides a wide selection of material for developing scenarios. It should be pointed out that once scenarios are developed from the data, these scenarios should be validated by both military and civilian SMEs.

As mentioned, all three scenario development approaches provide unique and effective ways to employ scenarios. Deciding which approach to include in the CA training toolkit will need to be balanced with current CAF training needs and resource constraints.

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(U) Defence Research and Development Canada, Toronto Research Centre (DRDC TRC) has launched an applied research program (ARP) to develop a training toolkit for Canadian Armed Forces (CAF) personnel operating in the comprehensive approach (CA). This approach fibrings together all the elements of power and other agencies needed t create enduring solutions to a campaign,fl including joint and multinational military forces other governmental departments (OGDs), non-governmental organizations (NGOs), and international organizations (IOs) (Canadian Forces Joint Publication Œ CFJP 3.0, 2011, p. GL-3). Research has indicated that operating in a CA environment may present challenges for CAF personnel (Thomson, Adams, Hall, & Flear, 2010) and, therefore, it demands specific training (Filardo, Thomson, Harkness, & Adams, 2013). Military subject matter experts (SMEs) identified communication, relationship building, and negotiation skills as competencies necessary for the CA because of the civil-military component, but they said there was little CAF training to develop these competencies with respect to interactions with civilians from interagencies and NGOs (Filardo et al., 2013). In support of the DRDC, Toronto Research Centre ARP, this project had two objectives: 1) to examine data collected from earlier research on civil-military collaboration (Thomson et al., 2010; Thomson, Adams, Hall, Brown, & Flear, 2011a; Thomson, Adams, Hall, Brown, & Flear, 2011b; Filardo et al., 2013) and identify critical incidents pertaining to communication, relationship building, and negotiation skills for future scenario development; and 2) review the literature on scenario development and application. To this end, a detailed coding scheme was developed for each competency of interest. In total, 776 passages were coded as potential sources for scenario development. The literature identified three ways that scenarios could be used for CAF CA training, including scenario-based learning (SBL), situational judgement tests (SJT), and case studies. Using the coded data, an example for each scenario methodology was created to demonstrate how scenarios could be used to train CAF personnel for the CA.

(U) Le Centre de recherche de Toronto (CRT) de Recherche et développement pour la défense Canada (RDDC) a lancé un programme de recherche appliquée visant à mettre au point une boîte à outils didactique à l™intention du personnel des Forces armées canadiennes (FAC) opérant dans le cadre de l™approche exhaustive. Cette approche « réunit tous les éléments du pouvoir et les autres organismes requis pour créer des solutions durables à une campagne », y compris des forces militaires interarmées et multinationales, d™autres ministères, des organisations non gouvernementales (ONG) et des organisations internationales [Publication interarmées des Forces canadiennes(PIFC) 3.0, 2011, p. GL-3]. Des études indiquent qu™opérer dans le cadre d™une approche exhaustive peut présenter des défis au personnel des FAC (Thomson, Adams, Hall et Flear, 2010), et cela exige par conséquent une formation particulière (Filardo, Thomson, Harkness et Adams, 2013). Des experts en la matière (EM) militaires ont indiqué que des aptitudes à communiquer, à établir des relations et à négocier sont des compétences nécessaires dans le cadre de l™approche exhaustive en raison de la composante civilo-militaire et ont précisé que les FAC avaient peu de cours permettant de développer ces aptitudes pour ce qui est des relations avec les civils d™interinstitutions et d™ONG (Filardo et coll., 2013). À l™appui du programme de recherche appliquée du Centre de recherche de Toronto de RDDC, le présent projet comporte deux objectifs : 1) examiner les données recueillies dans le cadre d™études antérieures sur la collaboration civilo-militaire (Thomson et coll., 2010; Thomson, Adams, Hall, Brown et Flear, 2011a;

Thomson, Adams, Hall, Brown et Flear, 2011b; Filardo et coll., 2013) et cerner les incidents critiques liés aux aptitudes à communiquer, à établir des relations et à négocier en vue d™élaborer des scénarios; et 2) procéder à une revue de la littérature sur l™élaboration de scénarios et leur application. À cette fin, un schéma de codage détaillé a été conçu pour chaque aptitude visée. En tout, 776 passages ont été codés comme sources possibles pour l™élaboration de scénarios. La revue de la littérature a permis de déterminer trois façons d™utiliser les scénarios pour la formation sur l™approche exhaustive des FAC : les mises en situation, les tests de jugement situationnels et les études de cas. À l™aide des données codées, un exemple a été créé pour chaque méthode afin de montrer comment chaque scénario peut être utilisé pour former le personnel des FAC en ce qui a trait à l™approche exhaustive.

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(U) comprehensive approach; whole of government; interagency; JIMP; scenarios; training; education; Canadian Forces