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"A Multidimensional Approach to Studying Cultural Differences and Coping Strategies in a Multinational Coalition Environment"

Multinational Endeavors; Cognitive and Social Issues; Organizational Issues.

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Abstract

Current and future coalition operations increasingly involve collaboration on operations beyond the traditional battlespace. The challenge is to communicate effectively among multinational teams and to understand each nation's developed communication culture. During multinational collaboration, communications are often via electronic networks. This, as a result, removes physical presence and rich context information with the important verbal, behavioural and cultural cues that are often vital to appropriately interpreting the content of the information. In addition, communication preferences, customs, variations in language use and other linguistic and cultural characteristics may create barriers between nations, even without electronic mediation. In this paper, we propose a multidimensional approach, which would capture major aspects of cross-cultural communication and provide a systematic and a comprehensive method for studying communication preferences and peculiarities in the light of cultural differences. More specifically, we propose to analyze data from cross-cultural, cognitive, and linguistic perspectives. Our approach will identify crucial elements involved in cross-cultural communication. Our approach will also discuss overall and individual strategies in collaborating, which can serve as a basis for training to improve multinational communication effectiveness.

Keywords: Cross-cultural communication, common ground, linguistic pragmatics

Introduction

With the increase in missions beyond traditional battlespace environment, coalition forces have taken on additional tasks in peace keeping and humanitarian relief. These add additional challenges to the communications between multinational coalition forces. The need to conduct operations in this situation has significantly emphasized the importance of low level tactical leaders (Krulak, 1999). Previous studies have shown that collaborating nations are having difficulties communicating when planning these complex and ever changing operations (e.g., Sieck, Rasmussen, 2007; Pierce, 2002a; Pierce, 2002b). At present, there is no guidance on how to address cross-cultural communication barriers that restrict effective and efficient information flow between mission control centres. Existing electronic means of communication (both software and hardware) are not necessarily designed to support cross-cultural communication and may be affected by previous designs flaws. They are also dependent on the latest technological trends as well as having been designed with a specific culture in mind.

The cultural communication preferences and customs can be thought of as cognitive filters toward the world, which facilitate communication, provided the participants have the same filters. Cultural communication preferences in collaborative exercises can also be viewed in terms of shared common ground (Clark, 1996). Without these shared filters,

or common ground for understanding them, misunderstandings can easily occur and the time spent on clarifying information or presenting it can be lost. This can occur when people do not have the same filters to interpret the information, thereby perhaps in their minds referring to other things than were initially intended.

To understand how best to support collaborating nations in their efforts to cross cultural communication barriers, we propose a combination of theoretical approaches or paths for studying the aspects of common ground, cultural communication preferences and language use from different angles. Our proposed overall approach would result in a multidimensional view on how miscommunication can be prevented and how frictions can be alleviated in multinational cooperation. Our approach is data driven; collected data will provide insights into cultural preferences and the formulation of cultural filters that can help improve multinational communication effectiveness. These cultural filters can be integrated into training programs, software programs or can be incorporated as additional features into existing tools. Collected data can also be used to inform doctrine and procedures that allow multicultural communication to flow more smoothly. Given the complexity and hidden nature of cultural cues, both verbal and non-verbal, it is important to study the actual military personnel in a context as close as possible to their operating environment.

In our view, cross-cultural coalition communication involves several fundamental aspects, specifically cultural traits, cognitive and mental models, and patterns of language use. By cultural traits, we refer to cultural conventions, customs, processes and preferences. By cognitive processes and models, we include world views, norms and assumptions from a particular cultural background. While cultural traits and cognitive models are underlying factors, language is the primary medium for communication. Coalition communication largely involves and depends on verbal communication (with or without electronic and digital means). Understanding of cultural traits and cognitive models is essential to the root causes of cross-cultural communication and will provide explanation of miscommunication instances. Data driven language analysis would provide objective analysis of cross-cultural language use and thus provide insights regarding effective language use and interpretation.

Studying Levels of Culture

Culture is acquired in the process of being trained, working and, in some cases, living in the same community. It becomes thoroughly integrated into one's outlook and behaviour and cannot be replicated in a simulation experiment by other than actual personnel from the group of interest. There are at least three levels of underlying culture that are specific to the task at hand, (i) each nation's culture, (ii) military or organisational culture and (iii) professional or expert culture (Hofstede, 2004).

These levels of culture are all influencing collaboration in one way or another, and cannot easily be separated from each other. An integration of theoretical paths is proposed to study these aspects of military cultures during collaborative coalition work. Moreover, each nation has information needs specific to the job, which are not necessarily the same

across nations and depend on culturally developed working environments. For example, although the ranks of collaborators from two different nations may appear to be the same, the level of responsibility and the position in the chain of command can differ greatly (Storr, 2004).

As part of the International Technology Alliance, a joint US and UK research programme, Cranfield University, Systems Engineering & Assessment Ltd (SEA) and Boeing are working together to jointly develop a methodology to study cultural differences, analyze their potential impacts on cross-cultural communication, and identify relevant means of managing them to facilitate coalition communication.

Combination of Three Paths to the Study of Cross-Cultural Communication

In this paper, we propose an integrated approach combining three research approaches or paths (Figure 1) to the study of cultural communication differences and similarities. The paths look at the interactions of personnel of collaborating nations from three different perspectives to gain insight on: (1) group strategies for working through or around frictions caused by a lack of common ground; (2) individual strategies and thought processes of dealing with cultural differences and misunderstandings; (3) differences in verbal cues used by speakers from different cultures to indicate their pragmatic intent (i.e. the effects they intend their utterances to have on the speaker) as a source of miscommunication.

Social Sensemaking

The first research path will study the overall coordination in collaborating headquarters, specifically focusing on gaining understanding of how common ground (Clark, 1996) is formed, altered and made sense of. Common ground is the sum of two or more people's joint, common or shared beliefs and knowledge, formed through the coordination and sharing of tacit knowledge and other information. According to Clark, the difficulty when communicating with others is to decipher what the message actually *means*, as in what the intended meaning is. In the British army, the meaning behind an order is known as the commander's intent, and is highly reliant on the tacit knowledge and the common ground of the commander and his sub-commanders. Meaning is thereby not something that can be understood independently of its context, it is constructed and understood as part of a communication act and therefore reliant on coordination. Research on a group level would be based on a grounded theory approach and use verbal recordings and observations to study strategies for achieving common ground.

To create common ground, there may be some strategies and some people that are more successful than others at making sense of the information and at making sense of other people and their respective cultures.
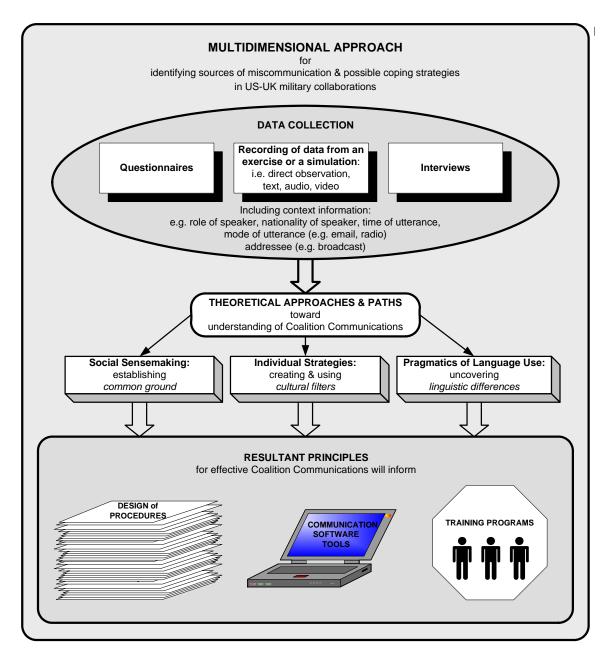
Figure 1. Multidimensional Approach to Studying Cultural Differences and Coping Strategies in a Multinational Coalition Environment

The social sensemaking method will study the overall coordination in collaborating headquarters, how a multinational group goes about rectifying gaps in their common ground, what strategies they use to give and gain information, and how those strategies can be supported. This path will assess how individuals in a multinational group seek to work through the frictions associated with working in a multicultural context, as well as how they achieve a correct understanding of each other's meaning, and that of the commander.

Understanding Individual Strategies in Coalition Communication

The second research path is aimed at studying individual strategies to overcome cultural barriers in communication through the use of a "Cue-Recall Debrief (CRD)" protocol. It is a powerful technique for investigating cognitive processes and is proposed for studying cultural and national communication peculiarities, procedures, and strategies, in order to conceptualise cultural communication filters. CRD has been shown to have little effect on the complexity of the activity, operating environment, or the operator's experience of the event (Omodei, Wearing, McLennan, 1997). This makes this technique suitable for studying time and context dependent cultural elements of communication in the naturalistic setting of a mission control centre, elements which are difficult to examine in a laboratory experiment that cannot recreate a culturally developed working environment.

In previous studies, this method has uncovered distinct information-evolution stages, references, and strategies related to professional or expert culture. A group of pilots participated in the study flying the state of the art automated aircraft. Understanding of the use of available information influenced by practice led to the design of more efficient displays (Solodilova, Johnson, 2004). As a result, pilots perform twice as fast and with less error.

In this study, this method may uncover distinct cognitive processes that involve individuals going through different information-evolution stages, formulation of culture specific mind-references, and development of mental strategies that military personnel use to gain rapid insight into coalition culture. These can be compared between nations and organisations (e.g. government, military and private industry) to provide an insight into the formulation of cultural filters that would reflect individual cultural thought patterns in a more explicit manner.

Pragmatics of Language Use in Coalition Communication

The third research path focuses on the study of how cultural differences impact on language use or pragmatics, and how this contributes to miscommunication as well as recoveries from instances of miscommunications. Pragmatics refers to the study of how language is used and what effect context has on the interpretation of linguistic expressions (Levinson 1983). The notion of pragmatics has been used in linguistics and philosophy to refer to a wide range of phenomena of language use that have effects on the interpretation of the intended meanings of linguistic expressions (words, phrases, sentences, discourses, etc.). The term context is used to cover a wide range of concepts such as participants of the communication, the temporal and spatial parameters of the communication event, the beliefs and intentions of the participants, and the knowledge including the presuppositions of the participants in the communication event, and other social, cultural aspects that may have effects on the use and interpretation of language. In addition, organizational, professional and technical contextual information and knowledge can also be viewed as being cultural as discussed above. Their effects on language can be accounted for in the general framework of pragmatics. Based on the data collected, this method will identify patterns of language use of different cultural groups

and the relations between cultural differences and the differences of language use of these groups.

Data collection

Even though the social sensemaking and linguistic approaches lend themselves neatly to studying written communication, all three can be studied at the same exercise provided data can be recorded. The study of individual strategies requires further data collection, as well as interviews with the participants afterwards using the cue-recall debrief method (see top of the Figure 1).

Details of a Multidimensional Approach

In this section, we will describe each path in detail, and show how they form an integrated approach for study of cultural differences and coping strategies in a multinational coalition environment (Figure 1). The first two approaches focus on determining the cognitive underpinnings of miscommunication, i.e. the mental models or cultural filters of the speakers, and the strategies for achieving common mental models and learning and adapting to the mental models of other speakers, while the third approach focuses on linguistic forms and conversational norms followed when communicating about these mental models (or in the context of these mental models). Miscommunication can arise because of differences in the mental models or cultural filters between the speaker and the hearer or because of different modes of expression even when the two conversational participants have a common ground.

Social Sensemaking

According to Klein, Pongonis, and Klein (2000), "we interact most effectively with people when we can see the world as if through their [cultural] lens". However, it could be suggested that this does not have to be the case. While it is not necessary to understand *why* others think the way they do, there *is* a need for the actors from each nation to understand that their coalition colleagues from other nations might not think and view situations in the same way. It is therefore important to be aware of and open to other perspectives, and approaches. There is also a requirement for trust that solutions suggested by coalition colleagues might work as well as the candidates suggested by one's own nation. For these reasons it is important that attempts are made to assess how people go about coordinating their actions, and what factors may impede these efforts. It would also be valuable to identify and assess the strategies and tools that aid this coordination.

The difficulty in communicating with other people and receiving orders from others lies in deciphering what the message actually *means*. In the British military, what one tries to ascertain is known as "commander's intent", the idea behind the order that the sub-commanders should act upon for determining what they ought to do. Through doctrines and training, both US and UK military subordinates learn to understand the intent of the

issuer, be able to work out conflicts in a diverse environment and can carry out the order independently (Shattuck, 2000).

The intended meaning of the "sender" and the interpretation of that meaning by the "receiver"; what is communicated and what is actually understood, may not be the same (Clark, 1996). This can be due to differences in tacit knowledge such as culture or experience. It is therefore crucial to study how people recognise any discrepancies between intended and interpreted meaning, and also how they determine that the intended meaning has been understood, such as commander's intent.

Pigeau and McCann (2000) decompose the true commander's intent into two components, *explicit intent* and *implicit intent*. Explicit intent is what is stated in the order under the heading "commander's intent", the written statement. Implicit intent, on the other hand, is the interpretation of the explicit intent, derived from training, tradition, cultural values and personal expectations. Since implicit intent relies on culture, it is a highly tacit concept, a notion supported in interviews with military personnel at the Joint Services Command and Staff College (JSCSC), the Development, Concepts and Doctrine Centre (DCDC) as well as the Command and Staff Trainer in Warminster (CAST(S)). This is also the reason implicit intent, according to these military personnel, needs to be made explicit when dealing with other cultures, be they national or "only" other services from the same nation.

The process of understanding each other and coordinating efforts is achieved by communicating; by sharing information, tacit knowledge and all other parts that make up common ground (Clark, 1996). Common ground is, according to Clark, the sum of two (or more) people's mutual, common, or joint knowledge, beliefs, and suppositions, some of this being confirmed, other parts assumed. Communication, in Clark's view, is feasible only by the establishment of common ground, and thereby shared references. He views communication as a joint activity where speakers and listeners, two communicators, perform their individual actions in coordination as ensembles, in which the two together are more than the sum of the individual parts.

There are people who are better at getting along with a diversity of individuals, they may therefore be better at this coordination than others. They may have developed strategies or manners that make them more successful at grounding, finding discrepancies in their common ground and at coordinating actions. According to Klein, Phillips and Peluso's (2006) paper on the data/frame theory of sensemaking, problem detection and sensemaking involve questioning one's frame of the problem and being suspicious that one's understanding of the world may be incomplete. Klein et al define *sensemaking* as the deliberate effort to achieve understanding, and the active process of constructing data as well as meaning. People who are good at working with others may be better at sensemaking and problem detection, and at understanding what in a social situation to add to their common ground and what to question in order to work better together.

The social sensemaking path views *grounding*, the process of achieving common ground, as the basis in a multinational team for achieving an understanding of implicit intent. This path also views sensemaking as the basis of grounding, in knowing when to question

information and when not to, and how to find it or provide it. It may not be necessary to know everything about everyone, but to know if two or more views of the world are compatible, where any incompatibilities may arise, and how to discover them. Therefore, it is vital to study how a multinational group attempts grounding and achieves the coordination necessary to perform their tasks.

The aim of this path is to find grounding strategies to teach others, in order to speed up and improve the grounding process to enable quicker and better coordination in multinational teams. There will be a focus on frictions caused by misunderstandings in multinational groups, since these frictions probably result from a lack of common ground. Therefore, there will be an attempt to find what strategies members of multinational teams use to resolve these frictions, to see whether any strategies exist and how they are manifested.

This research path will first focus on finding people who by others are known to be good at working with new people. They will be interviewed to see if they are aware of differences in how they and others behave around new people from other cultures, as will their colleagues. Next, an observation will be carried out at a military or emergency services exercise to look at frictions caused by misunderstandings to see if there are categories of strategies that can be observed and elicited using grounded method. In the future, it will be interesting to study the influence of cognitive artefacts on these strategies, and which artefacts may impede or facilitate the grounding strategies.

Uncovering Individual Strategies in Coalition Communication

To uncover the individual strategies that help overcome cultural barriers in communication between nations working together on the same operation we have devised an approach containing three steps. It aims to uncover the complexity of information flow entwined within the cultural intricacies that personnel need to deal with in the task of planning a complex operation. It can inform future communication technologies, strategies and procedures.

The first step involves capturing real-time data, where a military participant wears a miniature camera on the side of his/her head pointing in the directions of participant's field of view. It can be attached to a headset to capture a participant performing his/her regular duties from beginning to end of the task from his/her point of view. The second step, the cued-recall-debrief interview, takes place immediately after the event where the military participant reviews captured video footage of the performed task from his/her perspective with the researcher. Both of these steps are based on the 'Cued-Recall-Debrief' (CRD) method (Omodei, Wearing, McLennan, 1997), which has been tested and is specifically modified to capture data required for this type preliminary exploratory study of intricate cognitive processes (Solodilova, Johnson, 2006).

The video footage captured from the military participant's point-of-view would provide a powerful stimuli for "… evoking the recall of a wide range of cognitive and affective experiences with minimum distortion of the complexity and dynamics of these experiences" (Omodei, Wearing, McLennan, 1997). This cued-recall-debrief step will

help trigger participants memory to evoke accurate and time-representative elements of the military participants' thought processes and track cultural cues noted by the military participant's, determine information flow throughout the event and uncover their strategies used to deal with cultural misunderstandings. The captured video footage is interpreted by the military participant and serves as a guide to a researcher in a later analysis, which is the third step of the approach.

An advantage of the three-step approach is that the empirical study and data analysis preserves the complexity of the environment and workflow, and does not influence it or interrupt it. In contrast to other observation studies where the researcher either interrupts the workflow, to ask questions about the thinking process of the operator or asks the questions after the work has been completed, relying on the participant to recall the right moment and events that followed, the proposed approach enhances established critical decision method for eliciting knowledge (Klein, 1989), by helping the participant to relieve the situation as it happened rather than recollecting it from memory, as recollection of events from memory has been known to differ between observed and self-reported events.

Three main advantages can be highlighted in this approach (for more details, see Annex A).

1. Concepts are derived from the real world observations from the officer's perspective without imposing a predetermined structure by a researcher, which are initially based and at a later stage grounded in fundamental information processing and cognitive theories. The structure and the content of information are guided by the events of the operation itself, which can be accurately recorded through iterative analysis after the event.

2. The probes for cueing the military participant's comments and for identifying the military participant's culturally specific information are provided through reliving the event by the officer from his/her own-point-of-view video footage (including audio, motion cues). The researcher merely prompts the military participant to comment during this debrief.

3. The approach traces distinct cognitive processes, the evolution of captured information throughout the entire operation without interruption of any activities, which helps to precisely trace the cognitive process throughout the mission. All comments are recorded during the debrief cued by his/her own-point-of-view video footage, hence not influenced by the researcher.

At this point it is appropriate to highlight the disadvantage of this unique method. The participant requires wearing a miniature camera, which can be attached to a headset. In previous studies (Solodilova, Johnson, 2006), participant became used to it in a matter of minutes, as it is light-weigh and out of participant's field of view (i.e. out of sight, out of mind). The cued-recall-debrief method requires real operators, which can be difficult to schedule and generally few are available to participate. The method requires a lengthy transcription of the video, audio and other cues data, followed by an extensive analysis.

However, it is argued the results acquired using this method do outweigh the disadvantages (Solodilova-Whiteley, 2006).

The main questions posed at the beginning of the analysis are aimed at the direction of interest, without limiting the field of search too early. Each main question requires several spiraling iterations to refine the question until it has been either explored in sufficient detail, or it cannot be broken down any further into data that would inform the study, or additional analysis is not required at this time. The questions become more specific and are refined further with every cycle through the four stages of analysis (Figure 2).
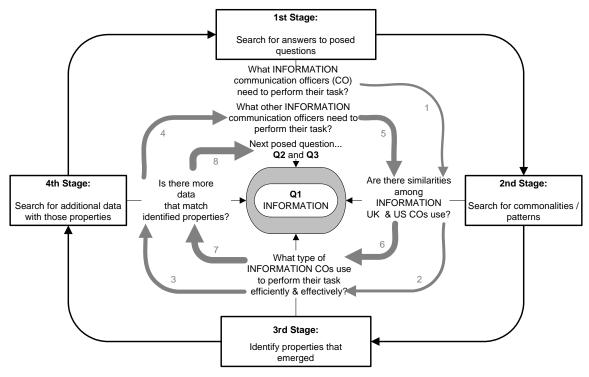

Figure 2. Evolution of the search

Three main questions will be posed as the analysis progresses[1]:

Q1 – What *information* do communication participants need to perform their tasks? And does it differ between cultures?

Q2 – Does the information have a *structure (or other peculiarities* and *preferences)* specific to culture and if so, what is that structure?

Q3 – Do US and UK military participants have *strategies or styles* in passing, assembling and using information to clarify the information about the developing situation or planning stages? Are there any cultural peculiarities?

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[1] NOTE: The questions are illustrative of the type of questions that will be asked during the study.

Figure 2 shows how the first question (Q1 - Information) is refined through several iterations (see numbered arrows from question to question). The next two main posed questions (Q2 – Structure and Q3 - Strategy) would go through the same process as the first main posed question in Figure 2 (see centre of the figure 'Q1 - Information'), with the only difference being that at the centre of the figure there would be Q2 – Structure and Q3 – Strategy. Both of these questions also would require their own iterations through four stages of evolutionary analysis with surrounding questions aimed to answer the centre main poised question in required detail.

Pragmatics of Coalition Communication

We will also take a linguistic pragmatics approach to the analysis of coalition communication. Linguistic pragmatics provides formal and systematic representations of communicative intentions of language use. Such representations characterize language constructs of communication (speech or text) in grammatical terms, establish links to the context in which the communication occurs and provide a framework for appropriate interpretation of language materials especially from a communicative point of view. A well constructed pragmatics framework will serve as the basis for analysis of such coalition processes as planning.

Appropriate interpretation and understanding of utterances among the participants of the communication requires shared information about the context of the communication event combined with shared linguistic knowledge. The linguistic information, as commonly assumed in linguistic pragmatics, includes lexical, syntactic, semantic and discourse information and structures. The contextual information for language understanding and communication typically involves information of the following types: the domain of discourse, time, place, participants, the participants' state of knowledge, belief and intention, what has been said or written before, other objects in the environment, and the state of the participants (see Bunt 1999 for detailed discussion of the variety of information relevant to the notion of context). For our purpose, we are particularly interested in and will be focused on lexical/pragmatic, syntactic/pragmatic, and semantic/pragmatic interfaces.

An initial data analysis (based on data known as the Singapore Data) indicates that much needs to be studied and known about the current coalition communication patterns, styles and other characteristics of language use so that appropriate strategies and technologies can be developed to improve process and cognitive interoperability among multinational forces and thus to improve the efficiency and effectiveness of coalition operations (Kao, et al. 2007). Importantly, our analysis suggests that many relevant issues are largely pragmatic in nature, beyond not only lexical and grammatical differences but also "semantic" (topic) similarity of the communication content. This supports our on-going efforts to understand the use of language in a social and communicative context by incorporating social, discourse and contextual information following the tradition advanced by Austin (1962) and Grice (1989), among other researchers. We believe that pragmatic dimensions such as speech acts (Searle 1969) and conversational types are essential parameters to successful understanding of the true nature of communication

threads, especially the question concerning the evaluation of communication effectiveness.

Our initial data analysis results also demonstrate the need for considering speech acts and pragmatics in general in analyzing communications. It should be pointed out that to account for cross-cultural communication, it is necessary to employ the relevant features and parameters to be identified in the cognitive and mental models of the relevant cultural groups. The subtle verbal cues to the speaker's intent will be analyzed in the light of some of the ideas by Wierzbicka (2003). She provides well-developed insights and a useful framework for analyzing the language differences marking subtle differences in the ways cultures indicate the actual intent of the user.

In particular, we will conduct conversational analysis (Hutchby, Wooffitt 1997). We will investigate and analyze conversational structures of different types such as declarative, interrogative, and imperative structures, which interact to form coherent conversational discourse allowing logical and temporal interpretation. We will also investigate how discourse connectives and markers contribute to the conversational structures and their interpretation. Conversational structures represented in a template or scheme will be used to guide the analysis and evaluation of the conversation. The analysis results will support our on-going and long-term efforts to develop a computational pragmatics framework and methodology.

It should be noted that in our larger effort under International Technology Alliance, there is an additional effort to collect communication frequency patterns such as spurts, and collaboration patterns based on the to-from of participants' information in communications. While it can provide additional interesting insight to the relevant issues, this effort will not attempt to study the content of the communication, as the approach proposed in this paper would.

Advantages and disadvantages of using a multidimensional approach to study communication

In this paper, we have discussed our approach and its three aspects that are designed to form a comprehensive view of the communication issues based on cultural differences. Scientifically, our approach is based on established cognitive psychology and new advancement in linguistic pragmatics. Our joint approach is designed to take into account subtle culturally based cues in verbal and non-verbal communication and consider them in context of multinational military operations. It also ties surface linguistic features and patterns to the social strategies and cognitive thought patterns, including the interpretation of commander's intent in the military context.

This approach poses challenges in data collection in the current military environment, because many communications are not mediated through technology. However, the military increasingly uses more collaboration tools as well as social networks tools in communications, which will make data more accessible. In addition to communication data collected in a non-invasive manner electronically, we also devise surveys and

interviews, as well as simulated electronic war-games where spoken communication can be recorded to help uncover key features in the coalition communication. These will help make up deficiencies in data collection in the interim.

At a more mature stage, our approach will serve two major functions. It will help identify, and measure communication challenges in specific areas that are culturally based. Furthermore, it can serve as a basis for future military training that will raise awareness and proficiencies in coping with challenges due to cultural differences.

Conclusion

The joint multidimensional approach presented in this paper proposes to look at different levels of communication: from use of technology, thought processes, use of language to action patterns and strategies. The approach is investigating a wide range of aspects, from group level intent, individual intent to intent at a semantic level, as well as communication behaviour and communication preferences. These can together provide a more encompassing perspective on cultural differences and communication difficulties, how they are handled and how they can be mitigated.

The group level approach will be looking at how a headquarters goes about resolving issues with common ground and how these strategies can be encouraged. This can possibly be achieved by teaching successful grounding strategies to members of multicultural groups, and also by showing that people in certain circumstances benefit more from use one artifact or process and not another.

The individual level approach will examine strategies people use in order to understand people from other nations, and will form theory for where and when misunderstandings so occur. As a result, people can be prompted with clarification questions or can be trained to use uncovered strategies to help them resolve issues before they become unnecessarily complicated.

Similarly the linguistic approach will help us understand cultural differences in the way people communicate different intentions and identify the problems in communication that may occur as a result. This could lead to changes in protocols or process and in training. Further down the line, with the development of a computational approach to recognizing these differences and the problem they engender, it might be possible to produce a tool to prompt people in real-time that a misunderstanding has occurred, and that they may need to resolve it.

An exploratory study is being conducted (Poteet, et al. 2008), as a preliminary stage in a multidimensional approach. It will help identify where and when during military operations the researcher's attention needs to be focused and will also help define scenarios to test our future hypothesis. In that exploratory study, we have looked at a small sample of anecdotes of miscommunication between UK and US military groups. The initial findings suggest that there are indeed cases of misunderstanding between US and UK personnel and that some of these could impact on operations.

It is proposed that the joint multidimensional approach described in this paper can bring an insight into multinational coalition missions and will facilitate future multinational coalition work, and the future of civilian as well as military ventures.

Acknowledgement

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Annex A: Cued-recall-debrief method suitability

From original two-stage to a modified cued-recall-debrief procedure with the use of head-mounted camera on the officer

The officer views a replay of a video footage taken with his/her head-mounted camera throughout the mission and speaks about his/her recollection of mental events associated with his/her decisions and choices that were made based on information he/she had. Officer speaks about recollections that are recorded (audio only) onto a new video file together with the original mission video footage. The audio recording of recollection are synchronized with the action captured by original mission video footage.

HOW IT WORKS

Omodei at el (1997) argue through the review of cognitive theories and literature that perception of own point-of-view footage triggers:
- recollection of mental events associated with decisions/information made at the time of original recording
- recollection of essential temporal aspects of cognitive processes

Through:
(a) motion of the camera and activity of the officer (Neisser, 1976)
(b) perceptual cues synchronized in time and space, i.e. visual, audio & recollection of previous knowledge used in the action of recorded events.
(c) replay and pause
(d-e) non-verbal cues
(f) cued by specific items, rather than cued by questions (Cantor, 1985)

Officer recollects:
(a) perceptual schemata rooted in locomotion & activity; recall of kinesthetic memories *(giving additional cues to recall)*
(b) non-verbal phenomena/holistic/intuitive information at the time
(c) put inchoate experience into words *(hard to acquire such information through questions or just external video footage)*
(d) motivation, memories, affects
(e) recall of pre-verbal experiences (*rather than a coherent & logical progression story prompted by the interviewer*)
(f) retrieval of episodic memory that is organized by time, place and perceptual characteristics

ADVANTAGES

Officers' real-world observation

Observation takes place in a realistic environment that places realistic demands on the officers in comparison to any laboratory observations, retrospective interviews and questionnaires (Omodei et al, 1997)

Head-mounted-camera on the officer as methods of collecting information

Minimum distortion of the complexity and the dynamics of these experiences (Omodei at al, 1997)
Less likely to distort subject's experience, i.e. 'out of sight, out of mind'

- Continuous
- Non-intrusive
- Non-reactive
- In real-time

Use of head-mounted-camera footage for cued-recall-debrief:

Valid and reliable reports on participants own experience (McLennan, Omodei, & Rich, 1997 Omodei, Wearing, & McLennan, 1998)

officer does not take it personally because he/she cannot see and not conscious of him/herself when watching a replay

Powerful stimulus for evoking recall, based on review of cognitive theories (Omodei et al, 1997)

The closest match between the initial and the replayed visual perspectives

Recall a wide range of cognitive and affective experiences (Omodei et al, 1997)

Accuracy and comprehensiveness of recalled material is greatly enhanced being cued from 'own-point-of-view' video replay (Omodei, Wearing, & McLennan, 1998)

WHY THIS SUITS THIS STUDY

Omodei et al (1997) study a decision making process in dynamic, safety and time-critical environment; This study focuses on uncovering cultural communication preferences and peculiarities in a similar demanding environment

This study aims to uncover cues officers use to understand meaning behind culturally imposed styles and strategies in communication styles in a complex environment hence the need for adjustments in the approach

Modified to a one stage process i.e. re-playing only once

Refined questions directed at information use

Method extended to inform design of future and current systems

During the operation the footage captures cues that are pre-verbal, intuitive and holistic
The goal is not only capture visual cues, but capture sufficient sensory cues to help the officer to recall their inner information processing, in order to cue the officer during a debrief session, capturing the way officer work with information during operation.
This method helps to capture the reality without altering information or course of events. During a debrief the officer relives the events again from their 'point of view'.

The aim is to identify cues the officer uses to understand the information transmitted; outline Cultural Communication Styles and Strategies to help officers to communicate effectively and efficiently