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Examining the Perception of Miscommunication in a Coalition Environment

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Abstract

The deployment of distributed coalition forces has changed the nature of command and control. Accurate and effective communication of command intent is critical for the success of complex and dynamic scenarios. Although English as a shared language between the UK and the US allows inter-cultural communication, instances of miscommunications due to cultural differences between multi-national military personnel have been recognised (Pierce, 2002; Poteet et al., 2008). Recently, Poteet et al. have conducted a study on miscommunications between the UK and U.S military working in a coalition. The results of their interviews led to the proposal that several types of language use could potentially lead to miscommunications (e.g. acronyms, jargon, slang, etc.). However, the frequency and impact of miscommunications arising from these categories of language use have not yet been explored. In order to do so, the present study uses a questionnaire comprising items that measure and compare the perception of the frequency and impact of these language uses. The results will be discussed in the context of the interpretation of command intent in multi-national operations.

Keywords: Miscommunication, distributed coalition forces, language use, communication media, culture.

Introduction

The modern military command and control (C2) environment is characterised by its requirement for increased operational tempo and by its use of joint and coalition forces. Moreover, as capabilities evolve it will increasingly rely on diverse human-agent teams. The complexity of interaction between the various human and agent teams may contribute to difficulties experienced in collaboration. Coalition forces carrying out commander's intent during critical command and control tasks are seen as providing creative techniques for problem solving. These creative techniques stem from the expertise existing within the collaborative framework. Whilst the expansion in creativity is extremely advantageous to the success of complex military operations, cultural variation can impact on multi-cultural teamwork (Dzindolet, Pierce & Dixon, 2008). Multi-national teams can experience difficulties with, for example, coordination and deployment of human-agents to execute command and control functions (Sutton & Gundling, 2005).

The command hierarchies of military personnel belonging to NATO countries are related and their members have some experience in common. However, as their command hierarchies are not identical, differences can lead to a reduced degree of common knowledge and shared understanding among members. Moreover, the behaviour of military personnel from different NATO countries (UK-US and others) is further influenced by cultural norms specific to their country. These cultural differences may lead to instances of misunderstanding between UK and US military personnel, particularly if they are unfamiliar with or new to a coalition environment, such as coalition headquarters.

Communications are the basis of a shared understanding and English, as a language shared between the UK and the US, affords inter-cultural communication. However, instances of misunderstanding due to the cultural differences and diverse backgrounds between multi-national military personnel have been recognized (c.f. Pierce, 2002).

A miscommunication event can be defined in several ways. For the present study, miscommunication refers to an event where the speaker's intentions are misunderstood or misinterpreted. The problems associated with miscommunications are further complicated by the fact that some may go unnoticed and any resulting misunderstanding may not be recognized as such. However, many miscommunication events are likely to be identified and resolved immediately with clarification requested almost instantaneously; these will not lead to any persistent misunderstanding.

The examination of miscommunication within coalition environments is in its infancy. In particular, little research has been conducted on the cultural differences in language use between the UK and US military and the effect these differences have on the quality and efficiency of communication. The research which has been conducted is of an exploratory nature, but has nevertheless provided interesting anecdotal evidence. Poteet et al. (2008) concentrated on exploring and classifying the linguistic differences in communications between UK and US military personnel. These differences represent not only lexical differences but cultural differences in the way language is used. An

exploratory study was conducted, adopting a qualitative approach in the form of semi-structured interviews, with the goal of extracting various typologies of language use that can lead to a miscommunication event. Five UK and five US military personnel were interviewed regarding their experiences of miscommunications when working with coalition military personnel from the other nation. The semi-structured interview required participants to describe the nature of the miscommunication and the context in which it took place (for example the medium of communication). The study led to the identification of 5 different types of language use that can lead to miscommunication events. These were acronyms, slang and colloquialisms, use of jargon, misinterpreted speech acts and denotation versus connotation.

Different language uses

Acronyms

Abbreviations and acronyms (pronounceable abbreviations) are constructed from the initial letters or groups of letters in a name or phrase. These have the potential to lead to miscommunications, more so when the same acronym or abbreviation means something completely different to military personnel in two different countries. Arguably, in many cases, misunderstandings as a result of the use of acronyms are likely to be instantly identified and resolved.

Slang

Slang is the use of highly informal words and expressions that are not considered standard in the speaker's dialect or language. Slang is problematic as the intention behind a phrase may be interpreted differently by the UK and the US military. Poteet et al. (2008) refer to an incident where an American pilot stated that they had contact with the "dirt ball road", a phrase not used by the British Forward Air Controller (FAC) trainee who would instead describe a runway between two fields. Examples such as this reflect how miscommunication during a military operation could have disastrous consequences (Poteet et al., 2008).

Jargon

Jargon is terminology used and accepted by specific professions and groups (e.g. different services). Jargon develops naturally in a group to allow a speaker to communicate a large amount of information in a word or short phrase. Differences in jargon exist between cultures, such as the US and the UK. For example, technical weapons vocabulary can differ between the British and American military. In many cases, such as in the military, a standard term may be given a more precise or specialised usage. Jargon becomes problematic if the terminology is not familiar to the listener. Poteet et al. (2008) refer to weapons technology to illustrate difficulties surrounding the use of jargon. If a new weapon is developed by the UK military, when communicating with an American officer, a British officer would need to refer to its equivalent in older weapons technology. The disadvantage of this is that using older weapons technology as a referent would not fully convey the capability of the weapon.

Speech acts

Speech acts refer to the various ‘functions’ a phrase can represent. For example, a phrase can represent a question, request or a statement. Some phrases/expressions can have more than one function. An example of a phrase that has two possible functions is, “Do you know what day of the week it is?” What may seem to be a question requiring a yes/no answer may actually be a request to know the day of the week. Poteet et al. (2008) pointed out that in a military setting, commands constructed by UK military senior commanders differ from those constructed by American military senior commanders. The style of commands of UK military personnel is often determined by British officers’ propensity to understatement. Poteet et al. illustrated their point with reference to a comment made by a retired US Air Force officer during an interview. The officer described how, due to British politeness, British officers would often generate commands beginning with “you may well wish to...”. The American officer reported this as being interpreted as a suggestion as opposed to a command.

Denotation versus connotation

Words and phrases have a ‘literal’ and ‘applied by use’ meaning. For example, the use of the word wicked can have opposite meanings. In the literal sense, *wicked* means “evil or morally bad” whilst it’s applied by use meaning is “great, wonderful”. Of course, if the implied meaning is used (“great, wonderful”) but the word is understood in terms of the literal meaning (“evil, morally bad”), a misunderstanding may occur due to the negative connotations of the word’s ‘applied by use’ meaning.

Medium of communication

An additional factor that can potentially lead to miscommunication events is the medium of communication, as outlined by Poteet et al. (2008). The type of communication medium through which collaborative interaction takes place has been identified as having a significant effect on the performance of teams (Stanton et al., 2006). The type of communication medium adopted in a military setting becomes important when considering the number of communication dimensions it supports, referred to as ‘media richness’ by Daft and Lengel (1986). They propose that media differ in their ability to transmit the meaning of information on four information richness dimensions: language variety, feedback, personal focus and multiple cues. Thus, the richness of different media can be calculated as the sum of scores on each dimension. Types of communication media that score low on the four dimensions are poor, for example those that exhibit delayed or no feedback and offer minimal cues, whereas those that score high are media rich, conveying multiple cues and immediate feedback. Any reduction in cues offered by a mode of communication restricts the information available to an addressee used to decipher the intent of a message (Stanton et al., 2006).

Text-based communication

Email as a type of text-based communication affords quick transmission of information and lends itself to the requirements of network enabled capability due to its remote access potential. However, email conveys no non-verbal cues which often can

signal important information regarding the speaker's intent. Non-verbal cues can refer to speaker rate, intonation, stress and loudness, and in face-to-face or video-mediated communication, facial expression and hand gestures are examples of non-verbal cues (Bull, 2001). Non-verbal cues are especially important when the literal meaning of a message is ambiguous (Kruger, Epley, Parker and Ng, 2005). In comparison to voice-only and face-to-face communication, the amount of information regarding meaning in an email is thus restricted. In addition, feedback is delayed with the use of email and this leaves little opportunity for potential misunderstandings to be first noticed and subsequently resolved. These limitations render email communication more susceptible to misunderstanding.

Kruger et al. (2005) argue that misunderstandings are common and are the result of people's propensity to overestimate their ability to convey information over email. They suggest that at least part of this overconfidence in communication ability is the product of egocentrism, the difficulty people have with trying not to view information solely from one's subjective experience and instead considering how information might be perceived by a listener who does not share the same perspective. Therefore, egocentrism could lead to information being inherently ambiguous over email. In line with these observations, these authors showed in a series of five experiments that participants overestimated their ability to communicate over email. Also, participants were shown to have difficulty in communicating the tone of a statement to an audience, in this case sarcasm, humour and seriousness. They concluded that egocentrism accounted for these findings. Thus, participants had difficulty imagining the perspective of their audience because they were unable to remove themselves from their own subjective experience. These findings have implications for the military as the ability to adequately convey the importance of a message would be mission critical. The problems in communication linked to egocentrism are not limited to email communication as speakers have also been shown to overestimate the effectiveness of their ability to communicate face-to-face (Keysar & Henly, 2002).

Audio-only communication

Audio-only communication provides non-verbal cues and is a popular mode of communication. Audio-only has been found to be characterised by longer dialogues, an observation which is argued to be indicative of less efficient communication. This argument is based on the absence of the visual channel for checking whether a message has been not only received but understood. It is also suggested that turn-taking, an important component of the communication process, is made more difficult in the absence of the visual channel (Boyle, Anderson & Newlands, 1994). Evidence pointing to the occurrence of miscommunication events when audio-only communication is used comes from research into pilot and Air Traffic Control (ATC) communication (e.g. Prinzo, Hendrix & Hendrix, 2006; Rantanen & Kokayeff, 2002). In order to minimise miscommunication and thus aid more efficient communication, the language, phraseology and structure adopted in pilot and ATC communication is highly constrained and standardised. Pilots are required to read back clearances issued by controllers verbatim. The controller is then expected to verify that the pilot heard and perceived the clearance correctly through hearback. Clearances are verified by the non correction of the readback. Although this procedure minimises failures, it also increases the working

memory load of pilots and controllers (Loftus, Dark & Williams, 1979). As a result, pilots and controllers often deviate from procedure by using shortcuts to minimise cognitive load (Rantanen & Kokayeff, 2002). Communication difficulties have been cited as contributing to errors during operations, which have included near collisions between aircraft midair (See Morrow, Lee & Rodvold, 1993).

Poteet et al. (2008) cite the recollections of a FAC during an interview. The FAC commented on how sometimes a trainee FAC would press the radio transmission button straight after he started speaking which resulted in the clipping out of the first and/or second syllable. However, with the use of digital systems today, which by and large ensure the smooth transition of information, clipping of information is no longer a problem. Task-irrelevant background noise is also an additional problem which clouds pilot-controller communication due to its deleterious effects on short-term serial memory (e.g. Banbury, Fricker, Tremblay, & Emery, 2003) and can be attributable to the cockpit, ATC centre or noise that emanates from equipment. From these observations and suggestions, one would expect more miscommunication events to occur when communication is in an audio-only context.

Face-to-face communication

Face-to-face communication is media rich considering information is transmitted over the visual and audio channel. The beneficial effect of the visual channel is that it allows speakers to monitor how the listener receives a message and draws inferences from these observations as to whether the listener understood the intent behind a message (Doherty-Sneddon et al., 1997). More efficient communication has also been observed with face-to-face communication compared to audio-only communication (Boyle et al., 1994). It may be that face-to-face communication is found to be more efficient than audio-only and video-mediated communication because it is a highly practiced method of communication, featuring well established visual cues such as gestures and expressions (Doherty-Sneddon et al., 1997).

Video-mediated communication

Video-mediated communication has been useful in remote communication as it provides a richer medium of communication with cues pertaining to the meaning of information being transmitted over both audio and visual channels. Thus as with face-to-face communication, video mediated communication provides an audience with both verbal and non-verbal information. Despite video-mediated communication being a rich medium of communication, Boyle et al. (1994) found video-mediated communication to be no more effective than audio-only communication as measured by accuracy in reproducing a route on a map and time taken to complete this map-reading task. The fact that video-mediated communication does not result in better communication performance in comparison to audio-only communication was also demonstrated by Green and Williges (1995) who used a collaborative writing task as their measure of communication performance. These findings have been explained with reference to the novelty of video-mediated communication where the speakers and listeners are unfamiliar with this communication environment. Further, the fact that the visual information in video links may be attenuated, resulting in a reduction in bandwidth, has also been put forward as a

possible explanation. Adding support to the above findings, Doherty et al., (1997) observed that video-mediated communications did not provide the same benefits as face-to-face communication.

There is an exception in the literature, where video-mediated communication has been shown to be beneficial when communication takes place within a stressful environment. Veinott, Olson, Olson, & Fu (1997) observed that pairs of non-native speakers performed better on a map-reading task when they used video-mediated communication relative to when audio-only communication was adopted. However, in keeping with previous findings (e.g. Boyle et al., 1994; Green & Williges, 1995), native speakers performed equally well whether audio-only or video was the medium of communication adopted during the map-reading task. When communication takes place between non-native speakers, Veinott et al. (1997) have argued that video allows speakers to monitor the listener, helping them develop a shared understanding due to the availability of non-verbal cues. This allows misunderstandings to be identified in a short time frame. Veinott et al.'s findings may be applicable to other instances where communication takes place in a stressful environment, such as that experienced in coalition operations (Poteet et al., 2008).

Objectives

To our knowledge, Poteet et al. (2008) qualitative study provides the only indicators of the types of cross-cultural linguistic barriers that occur in UK-US coalition based operations. However, tentative conclusions cannot be drawn from this research as the sample size used was small. As a consequence the results, though exploratory in nature, were not representative and/or generalisable to the wider UK-US coalition population. The aim of the present study is to address this methodological issue by quantifying the perceived frequency and impact of miscommunications between UK and US military personnel arising from the typologies of language use classified by Poteet et al. In addition, the perceived frequency and impact of miscommunications arising from different communication media will be investigated.

Method

Participants

Thirty-nine participants took part in this study. All of them answered all the items in the questionnaire and all of them were from the United Kingdom Armed Forces. They all had experience in coalition work with the US in different theatres of operations. The two main methods of recruitment at the Defence Academy of the United Kingdom have been posters put throughout the campus and emails sent to students on the Advanced Command Staff Course (ACSC).

Material

The study used a secured web-based questionnaire to address security issues. The questionnaire (see Appendix A) consisted of 10 questions. The answers were filled either with a drop-down menu or a scale where participants had to move a cursor to indicate their response. These types of question were used in order to control the information elicited from the participants and to avoid any inadvertent release of classified information. Only Question 2 required a typed answer as we asked what rank participants held. Given the number of different ranks in each service, the number of different items in a drop-down menu would have been too cumbersome.

The first question asked which service the participants were from. Question 2, as mentioned above, asked what rank the participants were at. The third question asked about the amount of time they had spent actively interacting in a US coalition. They could choose from three options: less than 3 months, between 3 and 6 months, or more than 6 months.

Question 4 and 5 were general questions about miscommunications. The first was about the perceived frequency of miscommunications when working in a coalition with the US. Participants had to choose from a series of responses ranging from “more than once a day” to “once a fortnight”. Question 5 asked about the perceived impact of those miscommunications on work performance. For this question, participants had to slide a cursor on a scale where the two ends of the scale read “No significance” and “Highly significant”. These 2 attributes were presented in a different order to each participant. The scale was separated in 100 segments and a score going from 0 (no significance) to 100 (highly significant) was obtained for each response. This type of scale was used for questions 5 to 9 with the labels at the end of the scale being reversed for each participant. For Question 6 to 9, all the scales within a question had the labels in the same order so that participants could show with their ratings the relationship between the different items.

Before starting to fill the questionnaire, the 5 different types of language use were briefly described. Question 6 asked about the perceived frequency of miscommunication associated with each type of language use. Participants were asked to compare the 5 types of language use and to give a rating that reflected their opinion for each of them. The scale went from very infrequent to very frequent and, again, the score obtained was between 0 (very infrequent) and 100 (very frequent). Question 7 was similar but was focused on the perceived impact of miscommunications arising from each type of language use. Again, participants were asked to compare the impact for each language use and to give a score that reflected differences between them. Question 8 and 9 were identical to Question 6 and 7 but were focused on different communication media, an additional factor suggested to contribute to miscommunications by Poteet et al., (2008). The different communication media examined were: face-face, audio-only, video-mediated and text-based. Finally, we asked participants their nationality in a drop-down menu.

Results

The breakdown of responses for which service the participants were in is as follows: From the 39 participants who took part in the study, 13 were from the Army, two were from the Royal Marines, seven were from the Royal Navy, and 17 from the Royal Air Force (RAF). Three participants had less than 3 months experience in a US-UK coalition, 11 had worked between 3 and 6 months in such a coalition whilst 25 had more than 6 months experience.

The breakdown of responses for the general frequency of miscommunications can be seen in Figure 1. A look at this figure shows that the distribution of scores seems to be normal. We can also see that the most frequent answer to that question is “More than once a week” with a quarter of our sample choosing this answer. The cumulative frequency for answers which are at least “more than once a week” is 69.1%. This means that 69% of the participants estimate that miscommunications happen, at least, more than once a week.

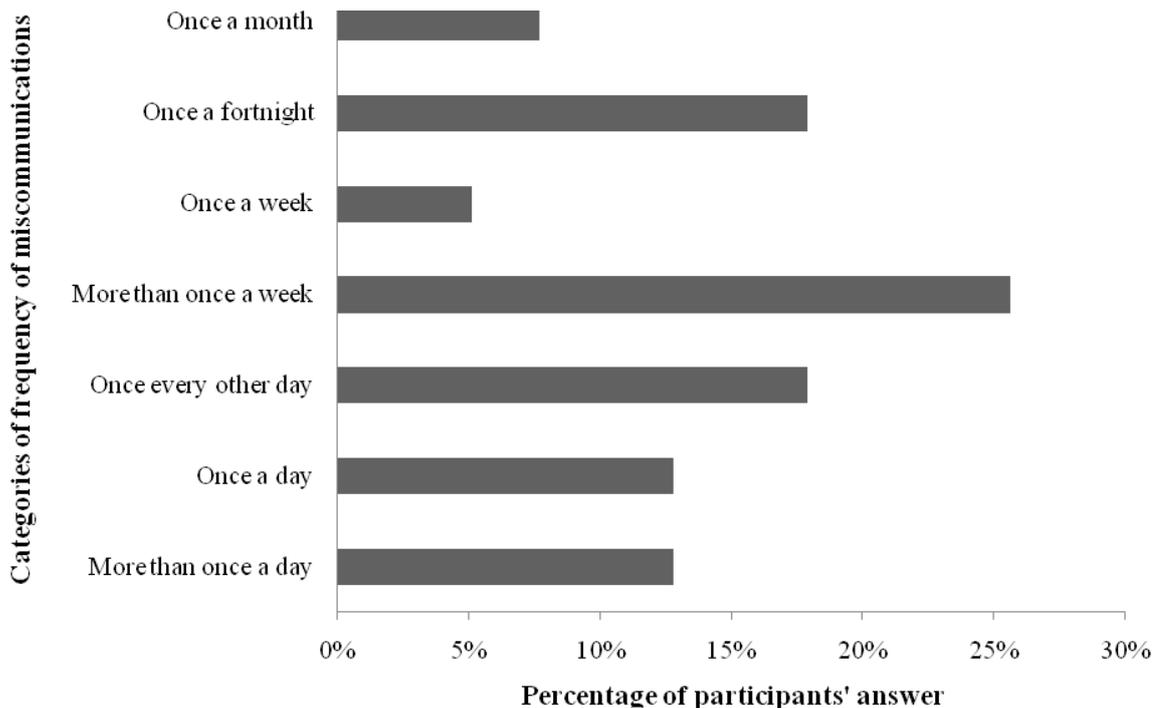


Figure 1. Percentage of participants for each different perceived frequency.

The general impact of miscommunications was also investigated. The mean score for the perceived general impact of miscommunications on work performance was greater than zero ($M = 43.87$, $SD = 22.99$). A score of zero would represent no

significance. A one-sample t test showed that the mean for general impact of miscommunication on work performance was significantly higher than 0 ($t(38)=11.92, p < .001$). This means that miscommunications do have some negative impact on work performance.

The perceived frequency of miscommunications attributable to the different types of language use can be seen in Figure 2. The means for each language use seem to be different from zero but there doesn't seem to be any significant difference between them. A series of one-sample t-tests were performed on each set of scores to verify that the means were different from zero (very infrequently). The perceived frequency of miscommunication arising from each type of language use was different from zero with T values varying between 14 and 18 and p values smaller than .001. Finally, An ANOVA was performed to verify whether the perceived frequencies for each type of language use were different. As Figure 1 indicates, the ANOVA didn't reach significance ($F(4, 152) < 1, p = .57$). It seems that miscommunications arising from the 5 different types of language use are somewhat frequent as indicated by the one-sample t-tests which show miscommunications arising from each type of language use occur significantly more than "very infrequently". However, the 5 types of language use lead to a similar perceived frequency as revealed by the non-significant ANOVA.

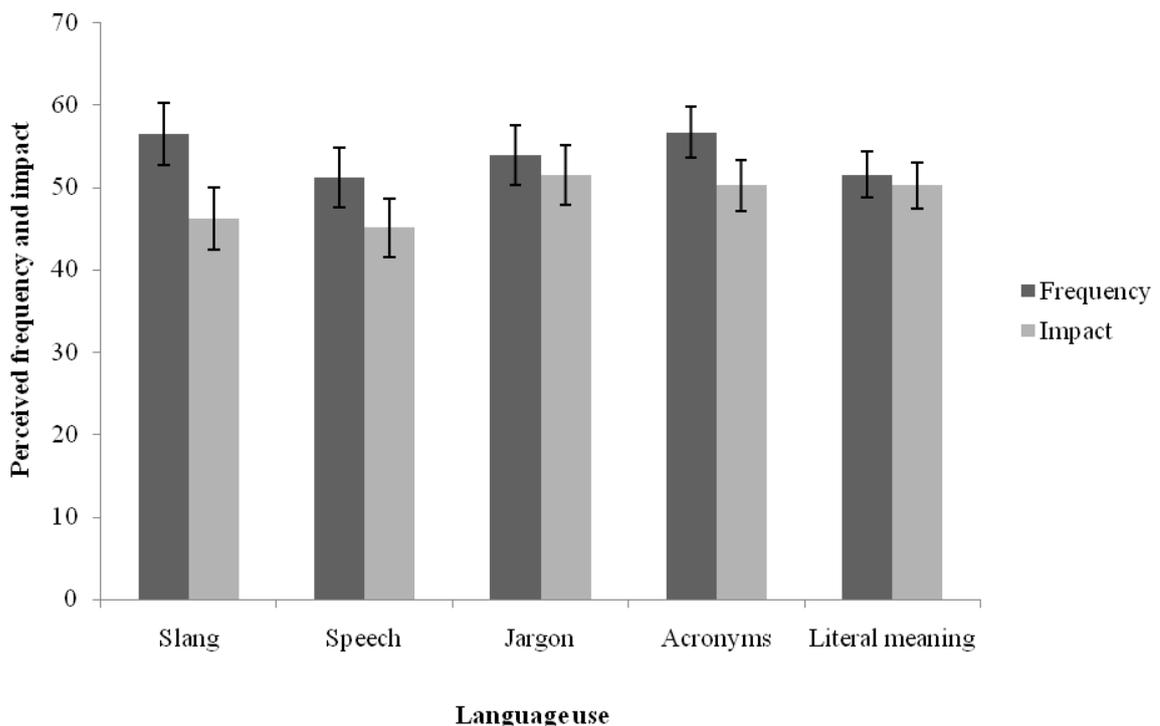


Figure 2. Perceived frequency and impact of miscommunications as a function of the type of language use.

The data for the perceived impact of miscommunication arising from the different types of language were analysed in the same way and reached the same conclusions. The mean results can be seen in Figure 2. First, we performed a series of one-sample t-tests to verify that the scores were different from zero (no significance). Again, the scores from the five types of language use were all different from zero (T values varying from 13 to 17 with $p < .001$ for all of them). An ANOVA looking for a difference between the different means showed that the means for each language use were not statistically significant, although the p-value approached significance ($F(4, 152) = 2.15, p = .08$). Again, the perceived impact of miscommunications arising from the 5 different types of language use have a significant impact but the 5 types of language use lead to the same level of impact.

Figure 3 shows the scores for the perceived frequency of miscommunications arising from different media. The figure shows that the mean perceived frequency of miscommunication for each medium is different from zero. A series of one-sample t-tests were performed in order to verify this conclusion. The t-tests were all significant (T value varying from 8 to 12 with $p < .001$) meaning that all the means were different from zero (proportion of 0%). The figure also indicates a difference between audio-only and video-mediated communication in terms of their perceived frequency. An ANOVA performed on the scores from the different media confirmed this observation. The main effect of media was significant ($F(3, 114) = 3.17, p = .027$). A pairwise comparison revealed the observed main effect of communication media on the perceived frequency of miscommunications was attributable to a significant difference between audio-only and video-mediated communication. Miscommunications arising from audio-only communication were perceived as more frequent than those arising from video-mediated communication ($M = 15.23, SD = 3.89, p = .002$). All other pairwise comparisons were not significant.

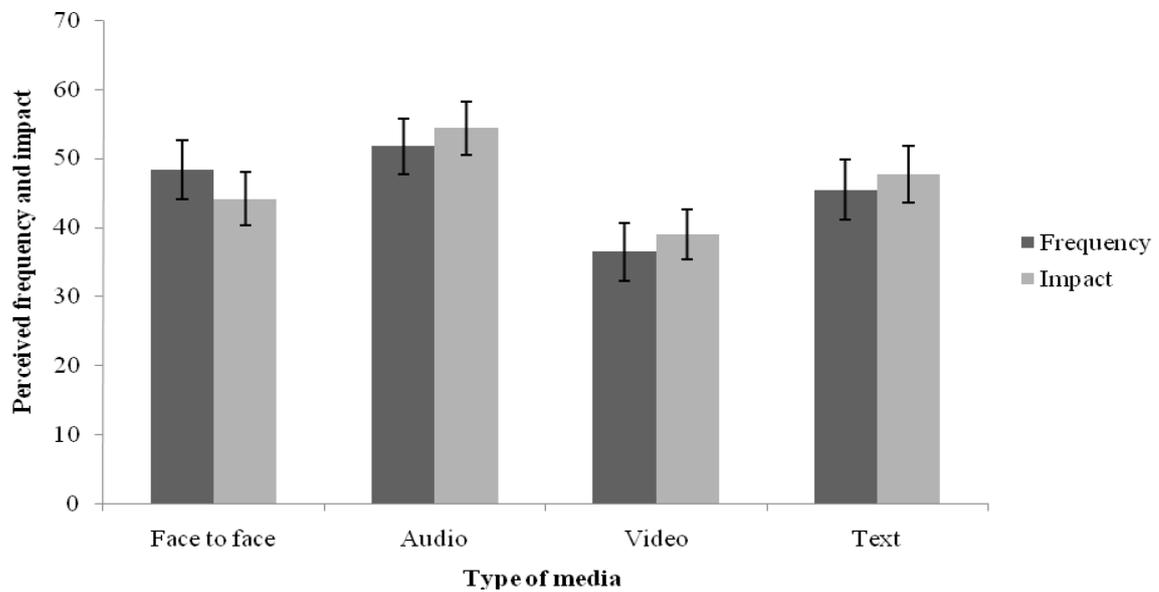


Figure 3. Perceived frequency of miscommunications as a function of the type of medium.

The same analyses were performed on the data for the perceived impact of miscommunications arising from the different media and these reached the same conclusions. As is indicated in Figure 3, the perceived impact of miscommunication for each medium was different from zero (no significance). Again, a series of one-sample t-tests was performed which showed that all the means were different from zero (T values varying from 10 to 14 with $p < .001$). An ANOVA was also performed which revealed that at least one difference was present between the means ($F(3, 114) = 4.75, p = .004$). A pairwise comparison showed one significant difference between two media, with audio-only communication having more impact on work performance than video-mediated ($M = 15.33, SD = 3.55, p = .001$). All other pairwise comparisons were not significant.

Discussion

The objective of this study was to validate empirically the claim that miscommunications in a coalition environment are frequent and lead to negative consequences. As mentioned before, the previous data available on this topic were based on a very limited number of anecdotal evidence. Contrary to previous research conducted by Poteet et al. (2008), the results of the present study were based on empirical data and the conclusions are clear and straightforward: miscommunications do happen and they have a real impact on work performance. Moreover, the different types of language use described by Poteet et al. do lead to a significant number of miscommunications but the 5 types seem to lead to a similar proportion of miscommunication. The same is true for the

impact of miscommunication caused by the different language uses: Language uses in general have a significant impact on work performance but they all lead to a similar level of impact.

The finding that miscommunications arising from audio-only communication were perceived as occurring more frequently and having a greater impact than those arising from video-mediated communication could be due in part to a large proportion of participants from the RAF (44% of our sample). Audio-only is the main method of communication between pilots/co-pilots and controllers. However, upon further inspection of the data the analyses show that it is not confined to the RAF as other services showed the same difference. One possibility is that audio-only is the most used medium of communication which in turn could lead to a higher frequency of miscommunication and hence a higher impact on work performance. However, the frequency of use for each medium has not been taken into account. Using the same logic, it is possible that video-mediated communication is the least used medium. In a future version of the questionnaire, we could include a measure for the frequency of use of each medium of communication. Another interpretation of the perceived greater impact of audio-only relative to video-mediated communication is that video-mediated communication provides a novel environment for interaction. Again, although we can only speculate at this stage, participants may have little experience of video-mediated communication in comparison to other forms of communication media. However, there was no statistical difference between the perceived impact of face-to-face and video-mediated communication making this interpretation unlikely. Given that miscommunications are perceived as more frequent and having a greater impact when using audio-only communication in comparison to video-mediated communication, it is reasonable to argue that different communication media are better for some tasks than others. That is, audio-only communication may be very good at the tactical level whereas audio and video communication may be better in an office-based environment.

A more fitting interpretation of the greater impact of audio-only communication, based on research in the literature, is that this mode of communication is not as rich. That is, the visual channel is not available and therefore non-verbal signals such as facial expressions and gestures, which can aid in the interpretation of intent, are unavailable. Moreover, in the absence of the visual channel participants are not able to monitor how their message is received by a listener which further reduces their chances of identifying possible misunderstandings (Doherty-Sneddon et al., 1997). Olson, Olson and Meader (1995) found that for design tasks, performance was significantly better when face-to-face communication was used compared to when audio-only or video-mediated communication was adopted. However, Doherty-Sneddon et al (1997) pointed out that the effects of visual cues on communication effectiveness seem to depend on the type of task performed and whether communication is remote or participants are co-present. Williams (1977, cited in Doherty-Sneddon et al., 1997) found that when a problem-solving task is performed there is no difference in terms of task outcome whether a face-to-face or audio-only communication is used.

Accent could also be something that is important in miscommunications. Informal evidence of this stems from the self-report of a participant who stated after completing the questionnaire that a colleague who had been on an exchange tour with the

USN advised them to ‘put on’ an American accent when talking to ATC, especially civilians. To our knowledge there is no literature showing an effect of accent on perception of the intent of information, however, it would be of interest to address this suggestion in a further revised questionnaire. Snedeker and Trueswell (2003) state that speakers of the same language share some implicit knowledge about the link between prosody and syntax and can use prosodic cues to help disambiguate phrases. However, speakers only provide prosodic cues when the environment does not give other relevant information to disambiguate an utterance. Whether or not the accent of a speaker modulates the role of prosody in the disambiguation of syntactically ambiguous utterances could be addressed experimentally by further research.

One potential problem with some of the data we gathered is that there may have been an anchoring effect for the questions involving a sliding scale. An anchoring effect could be described as an effect stemming from the presented starting value. For example, Tversky & Kahneman (1974) designed an experiment where they first asked participants “Do you think the percentage of African countries in the UN is above or below this number?”. Half of the participants saw the number 65 whilst the other half saw the number 10. A further, and more informative, question they asked was “What do you think is the percentage of African countries in the UN?”. The median percentage from participants who saw the number 65 when the first question was asked was 45% whilst the median for participants presented with the number 10 with the first question was 25%. As can be seen, the anchor seems to have a very important effect on the final score reported.

What we don’t know is if the means would have been the same with a different anchor. In the present study, the cursor was always presented in the middle of the scale. The main reason for this choice over a random presentation of the cursor along the scale was that we would be able to discard participants who didn’t move the cursor. However, we have no means of knowing if this fact has influenced the results. One way to alleviate this problem would be to ask participants to click on the scale to make the cursor appear. That way, we would know if participants have answered the question and we could compare the results with the ones from this questionnaire to see if the anchor had an effect.

Conclusion

In conclusion, the present study has shown that miscommunication events in a coalition US-UK do occur and that they do have a significant impact on work performance. Unlike previous research, these conclusions are supported by empirical data with a substantial sample size. The results supported Poteet et al. (2008) findings that the 5 different language uses identified could lead to miscommunications. Our results show that the 5 types are perceived to lead to frequent miscommunications and they are also perceived as having a significant impact on work performance. However, there was no difference between the different types of language uses in their perceived frequency or impact. Finally, another factor outlined by Poteet et al. was also investigated in this study, namely communication media. Again, our results support Poteet et al.’s conclusion that different media of communication would lead to frequent miscommunications which have a significant impact on work performance. In this case however, there was a

difference in the perceived frequency and impact between audio-only and video mediated communication with the former leading to more frequent miscommunications and a greater impact on work performance.

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Appendix A

Questionnaire

Thank you for accepting to take part in this survey. We are a team of researchers examining miscommunications arising from cultural variations in language use between UK and US military personnel working together in a coalition. We know from anecdotes that such miscommunications occur but at this point in the project we don't know their frequency or their impact on work performance. That's where your input will be invaluable!

This research is funded by the International Technology Alliance (MOD and DOD funded). For this reason, we are only interested in miscommunications happening between the US and the UK military personnel. The survey should take approximately 10 minutes to complete and will help focus our work on the more important aspects of miscommunication. Your responses will be anonymous and will only be presented in a collated or an analysed form. You can withdraw at any time without any consequences. If you have any question or comments, please contact Dr. Marie Cahillane (m.cahillane@cranfield.co.uk) or Dr. Caroline Morin (c.morin@cranfield.ac.uk).

Tick this box to confirm that you have read and understood the conditions of this study

Miscommunication in the context of this questionnaire refers to when the speaker's intentions are either misinterpreted or not understood by the listener. We are investigating miscommunications that occur in an operationally-related context.

Here are five types of language use that could potentially lead to miscommunications. Question 6 and 7 will be related to these so please read through the definitions of each type before answering this questionnaire.

1. Acronyms and abbreviations

Acronyms and abbreviations of names as well as words in set phrases are constructed from the initial letters or groups of letters in a name or phrase.

Acronyms differ from abbreviations as they can be pronounced as words.

Acronym	POL (petroleum oils & lubricants)
Abbreviation	Col (Colonel)

2. Slang

Slang is the use of highly informal words and expressions that are not considered standard in the speaker's dialect or language. Highly informal words and expressions can, for example, refer to the names of weapons, equipment, apparatus, rank and trade. An example is where an American pilot states that they have contact with the "*dirt ball road*", a phrase not used by British pilots who would instead describe a runway between two fields.

3. Jargon

Jargon is terminology used and accepted by specific professions and groups (e.g. different services). Jargon develops naturally in a group to allow a speaker to communicate a large amount of information in a word or short phrase. Differences in jargon exist between cultures, such as the US and the UK. For example, technical weapons vocabulary can differ between the British and American military. In many cases a standard term may be given a more precise or specialised usage among practitioners of a field.

4. Speech acts

Speech acts refer to the various 'functions' a phrase can represent. For example, a phrase can represent a question, request or a statement. Some phrases/expressions can have more than one function. An example of a phrase that has two possible functions (speech acts) is, "Do you have the time?" What may seem to be a question requiring a yes/no answer is actually a request to know the time. Another example is the standard UK greeting, "Are you alright?" This phrase could be interpreted as a question referring to how a person feels or a person's health or situation.

5. Literal meaning / implied meaning of phrases/expressions

Words and phrases have a 'literal' and 'applied by use' meaning. For example, the use of the word wicked can have opposite meanings. In the literal sense, wicked means "evil or morally bad" whilst its applied by use meaning is "great, wonderful". Of course, if the implied meaning is used ("great, wonderful") but the word is understood in terms of the literal meaning ("evil, morally bad"), a miscommunication may occur.

Q1. Which service are you in?

- Army
- Royal Navy
- Royal Marines
- Royal Air Force (RAF)

Q2. What is your rank?

Q3. How long have you worked in a coalition, interacting with U.S personnel?

- Less than 3 months
- 3-6 months
- More than 6 months

Q4. In your experience, how often do miscommunications (minor/major) occur when interacting with the U.S in a coalition?

- More than once a day
- Once a day
- Once every other day
- More than once a week
- Once a week
- Once a fortnight
- Once a month

Q5. In your experience, how significant is the impact of these miscommunications on work performance?

Please move the arrow to the position on the scale which best describes your experience.

Highly significant----------No significance

Q6. In your experience, how frequently do miscommunications caused by each category of language use occur?

Please move the arrow to the position on the scale which best describes your experience. Also, please make sure that the relationship between each type reflects your assessment.

Slang

Very infrequently -----  ----- very frequently

Speech acts

Very infrequently -----  ----- very frequently

Jargon

Very infrequently -----  ----- very frequently

Acronyms and abbreviations

Very infrequently -----  ----- very frequently

Literal/implied meaning of expression

Very infrequently -----  ----- very frequently

Q7. In your experience, how significant is the impact of miscommunications involving the use of each category of language on work performance?

Please move the arrow to the position on the scale which best describes your experience. Also, please make sure that the relationship between each type reflects your assessment.

Slang

Highly significant----------No significance

Speech acts

Highly significant----------No significance

Jargon

Highly significant----------No significance

Acronyms and abbreviations

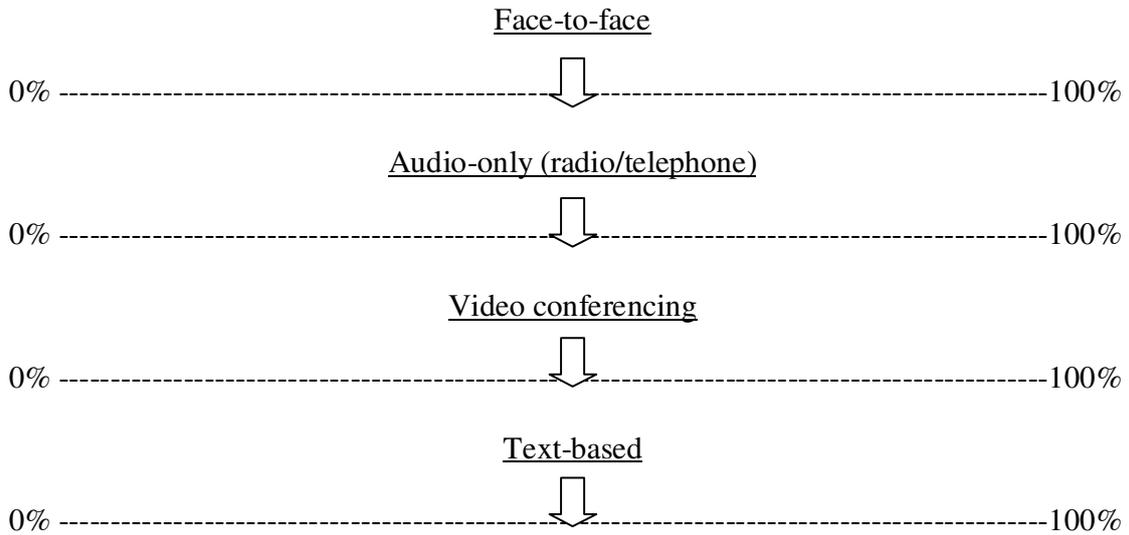
Highly significant----------No significance

Literal/implied meaning of expression

Highly significant----------No significance

Q8. What proportion of miscommunications is caused by each medium of communication?

Please move the arrow to the position on the scale which best describes your experience. Also, please make sure that the relationship between each type reflects your assessment.



Q9. How significant is the impact of miscommunications involving the use of each medium of communication on work performance?

Please move the arrow to the position on the scale which best describes your experience. Also, please make sure that the relationship between each type reflects your assessment.

Face-to-face

Highly significant-----No significance

↓

Audio-only (radio/telephone)

Highly significant-----No significance

↓

Video conferencing

Highly significant-----No significance

↓

Text-based

Highly significant-----No significance

Debriefing

Thank you very much for your participation in this survey. As mentioned earlier, this research is trying to understand the conditions in which miscommunications between U.S and UK military staff arise. Your answers to this questionnaire will help focus our work on areas which are more important or have more impact on your work.

Thanks again for taking part and if you have any question or comments, please contact Dr Marie Cahillane (m.cahillane@cranfield.ac.uk) or Dr Caroline Morin (c.morin@cranfield.ac.uk).